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DETERMINANTS OF ACCOUNTING INFORMATION TECHNOLOGY USAGE IN NIGERIAN BANKING SECTOR

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USAGE IN NIGERIAN BANKING SECTOR**

By

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ABSTRACT

Banks in Nigeria have increased their investment in the Information System (IS) as a fundamental e-banking tool, capable of yielding significant contributions to their financial income especially in cost efficiency. However, investment in Accounting Information Technology (AIT) is less effective due to many users complain of persistent systems failures, technical issues, lack of system stability, fraud and security challenges. Therefore, the main purpose of this study is to investigate the determinants of AIT usage in the Nigerian banking sector. Specifically, the study examines the influence of system quality, information quality, service quality, internal control quality, training and top management support on AIT usage. It also investigates the moderating effect of an external consultant involvement on the relationship between the system quality and usage of AIT. A cross-sectional survey was employed for data collection. A questionnaire was distributed to 571 samples, and 257 valid responses were obtained from regional or branch managers, and account managers of the banks. Partial Least Square path modeling was used in analyzing the relationship between the determinants and AIT usage as well as the moderating effect of an external consultant involvement between system quality and AIT usage. The findings from the direct relationship reveals that system quality, information quality, and internal control quality has a significant positive relationship with AIT usage, but service quality, training, and top management support has insignificant negative relationship. Furthermore, the result of the moderating effect reveals that the external consultant involvement significantly moderates the relationship of the system quality, information quality, and service quality with AIT usage. The outcomes of this study provides another insight to the banks' management with specific factors that they can leverage to improve the usage of the AIT thereby realizing the expected benefit of their investment.

Keywords: AIT usage, external consultant involvement, internal control quality, Nigerian Banks

ABSTRAK

Bank di Nigeria telah meningkatkan pelaburan dalam Sistem Maklumat (IS) sebagai alat e-perbankan asas yang mampu memberikan sumbangan penting kepada hasil kewangan terutamanya berkaitan kecekapan kos. Walau bagaimanapun, pelaburan dalam Teknologi Maklumat Perakaunan (AIT) kurang berkesan kerana banyak aduan daripada pelanggan mengenai kegagalan sistem yang berterusan, isu teknikal, ketidakstabilan sistem dan penipuan serta ancaman keselamatan. Oleh itu, tujuan utama kajian ini ialah untuk meneliti penentu penggunaan AIT dalam sektor perbankan Nigeria. Secara khususnya, kajian ini meneliti pengaruh kualiti sistem, kualiti maklumat, kualiti perkhidmatan, kualiti kawalan dalaman, latihan, dan sokongan pengurusan atasan terhadap penggunaan AIT. Kajian turut mengkaji kesan penyederhana penglibatan perunding luar terhadap hubungan antara kualiti sistem dan penggunaan AIT. Kaedah kajian rentas digunakan untuk pengumpulan data. Soal selidik telah diagihkan kepada 571 sampel dan hanya 257 maklum balas diperoleh daripada pengurus cawangan dan pengurus akaun bank. Model persamaan kuasa dua terkecil separa digunakan untuk menganalisis hubungan antara penentu dan penggunaan AIT serta kesan penyederhana penglibatan perunding luaran di antara kualiti sistem dan penggunaan AIT. Penemuan hubungan langsung menunjukkan bahawa kualiti sistem, kualiti maklumat dan kualiti kawalan dalaman mempunyai hubungan positif yang signifikan dengan penggunaan AIT, tetapi kualiti perkhidmatan, latihan, dan sokongan pengurusan atasan menunjukkan hubungan yang negatif dan tidak signifikan. Tambahan pula, dapatan kesan penyederhana menunjukkan penglibatan perunding luar menyederhana secara signifikan antara kualiti sistem, kualiti maklumat dan kualiti perkhidmatan dengan penggunaan AIT. Hasil kajian ini memberikan gambaran yang lebih lanjut kepada pihak pengurusan bank tentang faktor khusus yang boleh dimanfaatkan untuk meningkatkan penggunaan AIT demi mencapai manfaat yang diharapkan.

Kata kunci: Penggunaan AIT, penglibatan perunding luar, kualiti kawalan dalaman, bank Nigeria

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LIST OF ABBREVIATIONS

The followings abbreviations are used in this study:

AIT	Accounting Information Technology
AITU	Accounting Information Technology Usage
ACC	Accuracy
ATM	Automated Teller Machine
AVE	Average Variance Explain
BIS	Business Intelligent System
CBN	Central Bank of Nigeria
CL	Completeness
EOU	Ease of Use
EFF	Efficiency
E-Banking	Electronic Banking
EFT	Electronic Fund Transfer
E-PURSE	Electronic Purse
ERP	Enterprise Resource Planning
EXCO	External Consultant Involvement
GoF	Goodness of Fit
GDP	Gross Domestic Product
HRIS	Human Resource Information System
ICT	Information and Communication Technology
InfQty	Information Quality
IS	Information System
IT	Information Technology
INCO	Internal Control Quality
LAN	Local Area Network
NSE	Nigerian Stock Exchange
PLS	Partial Least Square
RBV	Resources Based View
SEC	Security
ServQty	Service Quality
SPSS	Statistics Package for Social Sciences
SEM	Structural Equation Modeling
SysQty	System Quality
TMS	Top Management Support
TL	Timeliness
TR	Training
UK	United Kingdom
US	United States
VIF	Variance Inflation Factor
WAN	Wide Area Network

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The use of information technology (IT) has been widely recognized to enhance management decision making and capability. Greenstein-Prosch, McKee, and Quick (2008) consider IT to include all the software and hardware products, information system operations and management processes, the human resources and skills needed to develop and utilize these products and processes to produce information. Accounting information technology (AIT) is considered a key part of the information needed for decision making in organizations. Negash and Gray (2003) conceptualized AIT as the addition of IT in the accounting operations of organizations. It is designed to generate and deliver information to managers at the right time, in the right place and the right format for effective decision making.

Accounting information technology is a set of interdependent activities, documents, and technology designed to collect, process and reports information to a wide group of internal and external decision makers in organizations (Hurt, 2013). Accounting information technology has the ability to integrate different organizational components and accounting procedures such as IT tools, accounting models, human resources, and data (Tokic, Spanja, & Blazevic, 2011). Consequently, this translates them into meaningful information for effective decision making by the management. The use of AIT in banks has facilitated the basic accounting functions of collecting, organizing, recording, and storing of accounting data used for decision making. The successful implementation AIT enables banks to transform data into information for

better analytical and reporting functions to aid decision makers (Amran, Abdul Rahman, Yusof, & Mohamed, 2014).

Effective AIT usage serves as a mechanism that enables banks to manage their resources effectively and provides them with an efficient service delivery system for their customers. Accounting information technology has been recognized as an effective tool for achieving not only internal changes but also external organizational changes (Agbolade, 2011). As such, many organizations, but especially banks, are left with no other option but to invest in the latest technology to satisfy the increasing needs of their customers and compete favorably.

Banks in Nigeria have increased their investments in AIT as a fundamental banking tool, capable of yielding significant contributions to their financial results especially in terms of cost efficiency (Adewole, 2013; Usman & Dandago, 2015). The Nigerian banking sector has witnessed a large transformation over the last decades with respect to the adoption and usage of these technological innovations. The banking sector accounts for about 70% of the sector's total investments and 46% of the total organizational IT spending in Nigeria (Central Bank of Nigeria (CBN), 2015). Moreover, the banking sector comprises more than 60% of the Nigerian capital market, which is the second largest stock market after South Africa in Africa (Nigerian Stock Exchange (NSE), 2013).

Accounting information technology makes it possible for banks to exploit the opportunities offered by providing integrated value chain systems, rapid financing services, excellent fund allocation and payments, global capital logistic services and cost savings (Fengyi, Olivia, & Sheng, 2005). The use of AIT has enhanced the computing power and standardization of operational activities of the banks, simplified multiple business transactions and led to the provision of more accurate and timely information to managers for effective decision making (Rodriguez & Spraakman, 2012). Accordingly, Ayanda, Veronica, and Ayodele (2011) claimed that banks managers perceived that AIT enhanced the effectiveness and efficiency of banking operations and strengthened the mutual relationship between banks and their customers. In essence, AIT are believed to improve banks outcomes.

However, realizing such benefits remains a challenge because banks in Nigeria do not realize half of the expected benefits of using the AIT applications (Ibrahim & Muhammad, 2013; Abubakar, Gatawa, & Birnin-Kebbi, 2013; Usman & Dandago, 2015). This is because banks are faced with the problems of the mismanagement of AIT, technical issues, training and maintenance issues that often led to low productivity, and the loss of customers' confidential information and AIT inventory (Dandago & Rufai, 2014). Moreover, many banks failed to sustain the benefits of AIT causing a tremendous fall in profits and the near collapse of banks across the country (Dauda & Akingbade, 2011). As a consequent, this has led to an adverse effect on the sector's competitiveness, shareholder returns, and the Nigerian economy at large (Oladipupo & Okafor, 2013).

Other AIT usage problems that Nigerian banks have faced include: increase in costs (Dandago & Farouk, 2012), the uneconomical utilization of resources, errors in financial reporting, and the underutilization or outright waste of valuable organizational resources (Kurti, Barolli, & Sevrani, 2013; Abbasi, Zamani, & Valmohammadi, 2014; Aali, Sargazi, & Tayyar, 2014; Molavi & Emamverdi, 2014). The failure to meet these challenges successfully may lead to post-implementation failure and the loss of a huge investment in AIT (Pan, Nunes, & Peng, 2011) and thus lead to negative consequences for a bank in terms of financial losses, waste of time and poor productivity (Onyemenam, 2013). These potentially negative consequences are detrimental not only to the operational efficiency of the banks, but also to the value-creation processes of the AIT systems and management decision-making process.

Besides technical issues, Ogah (2013) claimed that an alarming rate of fraud and inefficiency in the Nigerian banks was a critical issue with respect to AIT. In support of this assertion, industry reports and academic studies have revealed that electronic transactions fraud in Nigeria is on the rise. In 2014, a loss of \$310 million was reported from electronic fraud while 19,531 frauds cases were reported in 2016 as against 10,743 reported in 2015 with the total loss jumping to \$696 million in 2016 (Shazali, 2015; Olawoyin, 2017). Given this situation, Abubakar et al. (2013) claimed that the success of Nigerian banking sector depends on the proper and adequate utilization of AIT. Therefore, having an effective AIT is a critical factor in providing Nigerian banks with a more competitive advantage in the present market environment.

Despite the challenges and opportunities offered by an investment in AIT, little attention has been given to finding solutions for increasing AIT ineffectiveness. This is evident because banks managers continue to struggle to identify the positive outcomes that they hope to achieve from their large investments in AIT (DeLone & McLean, 2016). Indeed, Wongsim and Gao (2011) stated that inadequate literature of a standard framework for AIT exists that can assist managers in ensuring and improving the effectiveness of the technology. According to Ismail (2009), studies on AIT have contributed very little to the research on theory and practice, and even though the AIT theme should arouse interest, researchers have not explored this area sufficiently (Nour & Mensi, 2013).

Measuring AIT usage become an important issue for academics, practitioners, and managers. Evaluating what makes AIT usage successful is vital in the context of Nigerian banks; however, no general consensus exists among researchers and practitioners on how AIT will be measured (Floropoulos, Spathis, Halvatzis, & Tsipouridou, 2010). Consequently, multiple success models have been developed within the context of AIT and other disciplines, and this multiplicity has complicated the validation and comparison of AIT usage success model. Some of the commonly used models for measuring AIT usage by researchers include: DeLone and McLean's success model (1992; 2003); the Technology Acceptance Model, the Unified Theory of Acceptance and Use of Technology (UTAUT); and the theory of reason action task-technology fit model, among others.

In addition to a multiplicity of models, researchers have used multiple metrics in an attempt to explain the determinants of AIT usage. These measures have included: user satisfaction, system quality, information quality and service quality (Hien, Nguyen, & Cuong, 2014; Bach, Belardo, Bajwa, Kantharaju, & Prasanth, 2011); organizational learning (Cho, 2007; Hamdan, 2004); top management support, external expertise, and information system (IS) sophistication (Budiarto, 2014; Ismail, 2009); and internal control effectiveness (Abilola, 2014; Sajady, Dastri & Nejad, 2008; Abdallah, 2013).

Despite a large number of empirical studies, determining success factors for AIT implementation has remained an elusive goal for academics and practitioners, and the literature has not found much agreement on these antecedents (Spathis, 2006). For this reason, Bagozzi (2007) stated that AIT field risks being overwhelmed and misled by the growing but piecemeal evidence for decision making and technology usage (Bagozzi, 2007). What is needed is an integrated framework that identifies and explains the determinants of AIT usage in organizations and assists management in decision making.

Although previous researchers have sought and tested new determinants of AIT usage, additional important determinants no doubt have been omitted due to either inappropriate theory supporting the model of the study or a lack of research in the area (Petter, DeLone, & McLean, 2013). Therefore, searching for factors that could influence AIT usage remains an issue of utmost concern (Chalu, 2012). Importantly, in essence, research attention is absent on the determinants of AIT usage in the

Nigerian banking context that would enable banks to realize the benefits promised from their investment. Hence, this creates an opportunity gap to study AIT usage in the Nigerian banking sector. The next section identifies and discusses the motivation for current study.

1.2 Motivation

Several reasons motivated the current study. First, many researchers have studied AIT using different sets of variables and have produced conflicting findings. Based on the literature highlighted, diverging results exist regarding which variables are required to examine AIT in an organization. Most of these studies are fragmented, and researchers have taken different perspectives to understand the phenomenon. Some studies have focused on technical aspects, some on individual factors, and others on organizational levels (Hien et al., 2014; Dehghanzade, Moradi, & Raghieb, 2011; Cho, 2007; Chalu, 2012; Ismail 2009; Nabizadeh & Omrani, 2014; Khassawneh, 2014; Abiola, 2014). Thus, this has complicated the evaluation of AIT usage (Chalu, 2012). Moreover, a lack of comprehensive and integrative research exists on the variables that influence AIT success; nonetheless, the identification and measurement of success factors for AIT usage is of equal importance to the theory and practice of IT success measurement (DeLone & McLean, 2016). Taken together, these research findings suggest that more study is needed to evaluate the determinants of AIT usage in organizations.

Second, although previous studies have increased the understanding of success factors related to AIT usage, inadequate empirical evidence is extant that assesses

relationships at the organizational level (DeLone & McLean, 1992; 2016). Furthermore, more attention seems to be placed on evaluating general IT rather than evaluating specific IT (DeLone & McLean, 2016). DeLone and McLean (2016) strongly suggested the need for future researchers to explore the success factors in specific IT contexts. The application of DeLone and McLean model at the organizational level and to a particular IT context is lacking. Therefore, this call motivated the current exploration of AIT usage success factors in the specific context of the Nigerian banking sector.

Third, the literature has claimed that developing countries such as Nigeria lack academic research and that most empirical evidence concerning AIT usage has been conducted in developed countries such as the United Kingdom (UK), the United States (US) Singapore, and Sweden, where the technology was developed. Because of this context, generalizing their findings to developing nations with entirely different social, economic, and cultural characteristic is difficult and problematic (Khalil & Elkordy, 2001). Thus, the need exists for more research on AIT usage in a developing country like Nigeria in which managers are still searching how to reap the expected benefits of using these technology systems. Moreover, based on the researcher's knowledge no single study about this issue has been conducted in the developing country of Nigeria.

1.3 Problem Statement

Despite the issues of AIT usage, inadequate literature has evaluated the reasons for the persistent failure of its adoption. The failures keep developing countries including

Nigeria on the wrong side of technology divide, turning AITs into a technology of global inequality (Heeks, 2003). For this reason, AIT failure is a real and practical problem in Nigeria that needs to be addressed. Although previous studies have investigated the factors that are likely to result in technology failure, the rate of failure has not remarkably declined and failed projects continue to occur (Nelson, 2007). Thus, it is evident that more research on AIT usage in a developing country like Nigeria must be conducted because managers are still searching how to reap the expected benefits of using such systems.

Today, a growing concern has been expressed by bank staff and the general public regarding AIT usage in Nigerian banks, and many customers have complained of persistent systems failures and technical problems (Ekwueme, Egbunike, & Okoye, 2012; Dandago & Rufai, 2014). A lower-quality system is prone to errors, reliability issues, and not being robust, and having high maintenance costs and maintenance that is difficult to carry out (Torn, 1990). A poor quality system will likely exhibit persistent system failures, which, in turn, will have adverse effects on the operational efficiency of banks and result in increased product costs (Gorla, Somers, & Wong, 2010; Cenfetelli & Schwarz, 2011). Users who have experienced system failure in the past tend to doubt the capability of the technology to safeguard the confidential information they disclose during an online transaction. Therefore, the failure of online transactions may lead to a negative spillover effect, causing a user to lose confidence in other facets of the transaction process (Tan, Benbasat, & Cenfetell, 2016).

Another problem that users have expressed is inaccurate, incomplete or bogus information (Emeka-Nwokeji, 2012). For informed and strategic decision making, information quality has become a critical consideration for any organization that wants to perform tasks successfully (Wongsim & Gao, 2011). In particular, information quality is significant to the success of Nigerian banks. Previous studies have indicated that increasing the retention of customers by 5% may lead to a cost reduction of 15%, which, in turn, contributes to an increase profit by anywhere from 25% to 95% (Hong, Thong, & Tam, 2005). Effective AIT usage is critical to the survival of banks in the short and long run (Aduda & Kingoo, 2012).

On the contrary, poor information can have impact on the AIT usage and reduce the profit generation of banks. Inaccurate information has an adverse effect on the organization at operational, tactical, and strategic levels (Redman, 1998), and affects the quality of decision making. Indeed, poor information might be detrimental to the business success of the banks and increase user dissatisfaction and the non-retention of customers (Redman, 1998).

In turn, the absence of key AIT attributes may undermine the delivery of service content or support from the IT unit of banks, which, in turn, may lead to a complex transaction process for the user (Cenfetelli Benbasat, & Al-Natour, 2008). The lack of technical competency and responsiveness of a IT supporting unit can bring the operations of banks to a complete halt and, ultimately, to a dismal failure (Wong & Chen, 2006; Yang, 2008; Gorla et al., 2010). These unexpected outcomes may lead to

issues that challenge the fundamental ways of carrying out normal business activities of the banks. Thus, for banks to reap the benefits of AIT, they should ensure that quality service is delivered to users so as to enable adequate and reliable performance.

Moreover, the overwhelmingly rapid adoption of e-business technology in the Nigerian banking sector has resulted in new challenges particularly in the area of internal control (Ogah, 2013). For instance, insufficient internal control results in a low level of credit rating, a low level of profit, and a low cash flow from the operating activities of the banks (Elbannan, 2009). Although there are conflicting findings on the use of AIT and internal control problems in the banking sector, the fact remains that internal control has been closely associated with fraud (Ekwueme et al., 2012). Fraud is a major factor that causes bank distress in Nigeria (Onyemenam, 2013). The CBN (2009) reports postulated that internet-based fraudulent activities are growing fast in the daily business operations of banks. In this regard, Abiola (2014) concluded that, for banks to detect and prevent fraud effectively, effective internal controls are necessary. He further stated that these controls are particularly necessary for Nigeria in which many allegations of increased internet financial frauds have been made.

Industrial globalization has also contributed toward the problem of AIT failure in the developing countries. This occurs when the design AIT is for use within the context of developed countries that is subsequently transferred to developing countries through IT consultants or vendors without accounting for the conditions of developing countries. Often, this practice has led to the significant failure of the technology

(Heeks, 2003). Agwu, Atuma, Aigbiremolen, and Iyoha (2014) stressed that the challenges faced by banks in Nigeria included the lack of in-house technical know-how or support to utilize the technology effectively. This could lead errors that can contribute to loss, waste of time, and the reduced productivity of the banks (Amran, Abdul Rahman, Yusof, & Mohamed, 2014). For this reason, Moohebat, Asemi, and Jazi (2010) believed that developing countries such as Nigeria might require more support from external consultants to solve their problems related to AIT failure. They concluded that the users of AIT in Nigeria complained of inadequate knowledge of the new technology due to insufficient support from IT consultants. To avoid failure of the AIT, continuous training of the employees is indispensable because this training would reduce technical problems resulted from misuse (Ajami & Bertiani, 2012).

The literature claims that banks have invested in AIT, but often they do not realize the expected benefits; this implies that banks can only reap the benefits of AIT when appropriate factors such as system quality, information quality, service quality, internal control quality, training, and top management support are integrated and accounted for. Although these factors have been studied individually as highlighted earlier, studies of AIT usage have achieved inconclusive findings (Ali & Younes, 2013). According to Li (2010), once there are inconclusive findings, similar study can be replicated to broaden the scope of knowledge. Baron and Kenny (1986) recommended a test of a moderation effect where conflicting findings are present. In general, the theoretical framework of this current study comprises variables, which to

the best of researcher's knowledge, have not been empirically tested before in a similar manner.

1.4 Research Questions

Therefore, based on the problem statement highlighted in the previous section the following research questions were raised:

1. What is the relationship between system quality, information quality, service quality, internal control quality, training, top management support and AIT usage in Nigerian banks?
2. Does external consultant involvement moderate the relationship between the determinants of AIT (system quality, information quality, and service quality) and AIT usage in Nigerian banks?

1.5 Objectives of the Study

The broad objective of this study, which covers the topic, is to examine the determinants of AIT usage in Nigerian banking sector. Specifically, this study seeks to achieve the following objectives, they are:

1. To investigate the influence of AIT determinants (system quality, information quality, service quality, internal control quality, training, and top management support) on AIT usage in Nigerian banks; and
2. To determine the moderating effect of external consultant involvement on the determinants of AIT (system quality, information quality, and service quality) and AIT usage in Nigerian banks.

1.6 Significance of the Study

This study bridge the gap identified in previous research and equally contributes theoretically, methodologically, and practically in the following ways.

1.6.1 Theoretical Contribution

Despite the issues of persistent AIT failure as highlighted in the previous section, little attention has been given to improving adoption and usage. Notwithstanding, previous researchers have emphasized the importance of AIT in the banking sector (for example, Ayanda, 2011; Ogah, 2013; Adewole, 2013; Itah & Emeka, 2014). Nonetheless, limited empirical evidence exists on the factors that result in AIT failure in Nigerian banks. Similarly, DeLone and McLean's model (2003) concluded that a need exists for future study to explore other determinants that are omitted either due to inappropriate theory to support the model of the study or to the insufficiency of the research in the area (Petter et al., 2013). Specifically, DeLone and McLean (2016) placed an emphasis on the need for future studies to explore a specific IT context such as AIT rather than to explore general technology. Therefore, the current study has answered the call by extending the DeLone and McLean Model within an AIT adapted environment with an independent and moderating variable.

Based on the review of previous literature, it was found that little attention is given to the influence of internal control quality on AIT usage; thus, the current study incorporated the construct to the existing model. This study advocates the inclusion of internal control quality as an important determinant of AIT usage measurement.

Similarly, as a theoretical contribution, this study integrated both DeLone and McLean's model and the resource-based view theory by extending the moderating effect of external consultant involvement and its influence on the quality measures with a view to addressing the problem of inconsistent findings of the previous study.

1.6.2 Methodological Contributions

Qualitative analyses and the use of simple statistical approaches have dominated the methodologies used in evaluating the determinants of AIT usage. For instance, Kanungo, Duda, and Srinivas (1999), Bentley, Cao, and Lehaney (2013), and Khassawneh (2014) used qualitative approaches to explore the determinants of AIT usage. Also, another stream of researchers like Hien et al. (2014), Shih and Lin (2011), and Nabizadeh and Omrani (2014) have employed simple analytical tools such as SPSS in drawing their conclusions. They suggested that future study should use better analytical techniques and verify their current findings. By implication, many past studies might be characterized by an erroneous approach in research design and an insufficient in-depth data analysis. Therefore, in response to the call made, the current study employed survey research, and data were analyzed using a more robust statistical tool, Partial Least Squares.

Second, the measurement mode of the internal control quality, which is the new construct that was made to extend the DeLone and McLean model, was not specified previously. The internal control quality construct was adapted from Alzoubi (2011); however, the author was silent on whether the indicators are reflective or formative.

Hence, this current study specified the measurement mode of the construct as reflective. The measurement mode of the items has met the requirements relating to indicator loadings and convergent validity and internal consistency, which were evaluated using composite reliability. Similarly, despite the conceptualization of the system quality and information quality measures as a composite concept in DeLone and McLean's (1992; 2003) Model, previous studies have treated these constructs reflectively. Therefore, this current study treated the constructs as second-order formative constructs, thereby correcting the flaws of previous studies. Further discussion on the methodological contributions is provided in Chapter Six, section 6.5.2.

1.6.3 Practical Contributions

The result of this study provides bank managers with updated information on the factors that have resulted in the phenomenon of AIT failure. It is the researcher's view that understanding and identifying the cause of the problem is equally important as knowing its influence. In this instance, banks will be able to achieve the maximum benefits expected from their huge investments in AIT software and devise a possible way of improving the situation while satisfying the various need of their existing and prospecting customers. Moreover, this study provides useful information to managers and other decision-makers in the Nigerian banking sector, to improve the problems of ineffectiveness and low productivity in their organizations (Dandago & Rufai, 2014). Also, by focusing on a developing country like Nigeria, this study answered the calls made by previous researchers for the need to research the AIT discipline in such a

region of the world. This is because most previous studies of AIT have been conducted in developed countries (Khalil & Elkordy, 2001; Nour & Mensi, 2013; Khassawneh, 2014; Nabizadeh & Omrani, 2014).

Specifically, the findings of this study imply that managers, practitioners, and academics should promote and give close attention to these key determinants as they have significant effects on AIT usage. This finding further provides stakeholders with insightful information on how to reduce the problem of operational inefficiency thus, increasing the return on investment of banks. Also, existing customers would gain confidence during online transactions. This, in turn, would strengthen the relationship among bank employees as well as their relationship with their customers, therefore, enhancing the corporate image of the bank. In this situation, banks would be able to capture a larger segment in the market environment and be able to have higher returns on their investments in AIT. Consequently, this would translate to the enhancement of the socioeconomic activities of the societies at large. Moreover, the findings of this study would be important to other researchers who wish to study AIT in the Nigerian context as well as other developing economies, thereby enabling a comparison. Therefore, the current study contributes to the AIT literature and overall to the existing body of knowledge.

1.7 Scope of the Study

The rapid changes in IT have caused bank managers to adopt effective management tools including AIT so that they can market their products and capture a larger segment

of the markets in today's highly aggressive competitive market. Amenuveve (2014) asserted that, due to advancement in technology and the globalization of large-scale organizations, banks today are faced with the issues of how well to design, coordinate and manage their AIT to ensure effective planning, decision-making, and transformation of business operations. This situation necessitated the need for AIT study more especially in the banking sector (Al-Qudah, 2011).

Therefore, the current study focuses on the Nigerian banking sector, which has been the most dynamic sector due to its rapid responses to technological innovation. The sector has been recognized as the key driver of economic growth and development of Nigeria as earlier highlighted. In an attempt to save costs and meet the increasing demands of bank customers, commercial banks in Nigeria have invested immensely in technological innovations such as AIT. Accounting information technology is believed to enhance the operational efficiency and enable banks to compete favourably in the market environment. However, the realization of the promising benefits has become a great challenge to the banks, and little attention has been given to providing solution to problem. Thus, this study examines the determinants of AIT usage in the Nigerian banking sector. However, to have a clear understanding of the phenomenon, the current study specifically focuses on the branches of banks. The unit of analysis of this study is organizations, and the targeted respondents are bank managers (regional and branch) and account managers of the banks. The study considered eight (8) constructs only as identified in previous studies: system quality, information quality, service quality, internal control quality, training, and top management support

(independent variables), external consultant involvement (moderator) and AIT usage (dependent variable).

1.8 Operational Definition of Key Terms

Table 1.1 indicates the definition of some key terms in this study.

Table 1.1

Operationalization of Key Terms

Item	Definition
AIT	AIT is concerned with the use of hardware and software application designed to implement the collection of data, measurement, and communication of information for planning and control the operational activities of the banks.
Data	This refers to raw facts that are captured recorded, stored and processed by the information system.
External Consultants Involvement	This is a specialist who has technical knowledge and experience of how the system operates and can assist users in understanding the system to utilize its potentialities to the fullest.
ICT	This is all the set of activities that facilitate the processing, transmission, and provision of information electronically.
Internal Control Quality	This refers to the mechanism adopted by banks to safeguard their assets, evaluates the accuracy and reliability of the accounting information, which ensures operational efficiency of the banks.
Information Quality	Information quality refers to as the ability of system to provide timely, accurate, relevant, and complete information to the user for effective decision making.
Information System	This is a set of formal procedures in which data are captured, processed and disseminated to different users.
IT	This includes the equipment, software and hardware, communication networks, databases as well as procedures used in collecting, analyzing, processing, and storing data.

Table 1.1 (continued)

Item	Definition
Service Quality	This denotes the degree of responsiveness, assurance, and empathy of the bank IT units which support the efficient operation in the bank.
System Quality	This state the degree of technical efficiency of the system, in terms of user interface consistency, ease of use, documentation quality, programming error and maintainability of the system.
Top Management Support	This is the extent to which bank managers provide funds, guidance and all the necessary resources needed before and after implementation of AIT.
Training	This refers to as the process of building the employees skills and knowledge to understand how important technology is and how it is related to their work and other functional areas within the organization so as to contribute to AIT usage.

1.9 Organization of the Chapters

This study comprises six chapters. Chapter One provides the background of the study in which issues about accounting information technology in the Nigerian banking sector and motivation of the study are discussed, which leads to an appreciation of problem of ineffectiveness currently experiencing in the Nigerian banking sector. Research questions were raised, and the chapter set objectives with the aim of answering the research questions. Furthermore, a discussion on the significance of the study in terms of theoretical, methodological, and practical contributions was highlighted. This is followed by the scope of the study and definition of key terms.

Chapter Two discusses banks, banking, and IT in Nigeria as well as AIT usage in the context of Nigerian banking sector and the general importance of AIT to organizations and banks in particular. Also, the chapter includes a discussion on current issues of

AIT; the chapter discusses the definitions and types of AIT used in organizations. The chapter further presents relevant literature on both the dependent and independent variables of the study as well the theoretical framework is presented.

Then, Chapter Three discusses the underpinning theories, and the hypotheses of the study were also formulated in line with relevant theories and literature.

Chapter Four discusses the methodology of the study and the philosophical approaches in the research method, following by a discussion of the research design, population of study, sampling technique, and sampling size. The chapter further discusses operational definitions and measurements of constructs as well as data analysis techniques.

Chapter Five presents the results of the study, which were analyzed using the Statistical Package for Social Science and Partial Least Squares (PLS) path modeling.

Chapter Six concludes the thesis. The chapter recapitulates and discusses the findings of the study in line with previous studies and underpinning theories. Discussions on the theoretical, methodological and practical implications are presented. It also discusses the limitations and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter begins with a discussion of accounting information technology usage in the context of the Nigerian banking sector. This is followed by a discussion of AIT issues, definition of AIT, and the general importance of AIT to organizations and banks in particular. Then, discussions of the relevant literature of the main focus of the study are presented including AIT usage. In addition, the chapter provides a discussion of the independent variables under investigation. Furthermore, the theoretical framework of the study is presented.

2.2 Banks and Accounting Information Technology in Nigeria

In response to the increasing demands for timely, efficient, and reliable services, commercial banks in Nigeria are increasingly investing in IT such as the AIT systems to re-position themselves and compete favorably in the current dynamic business environment. Banks require accurate and complete information as well as integration between different databases, applications, and documents as a means of understanding customers' behavioral patterns and preferences (Josiah & Nancy, 2012; Adewale & Afolabi, 2013). An effective AIT has the potential to overhaul the banking operations thus enabling banks to offer new products and services to meet the demands of their customers.

Accounting information technology refers to the use of hardware and software application designed to implement the collection of data, measurement, and communication of information for planning and control of the operational activities of the banks. It provides increasingly reliable real-time information based on user demands and allows access to information both at the headquarters and branches of the banks, thereby streamlining and enhancing banking operations. Accounting information technology has played a vital role in the repositioning of the Nigerian banking sector in terms of collection and efficient management of information. It provides managers with an efficient means of reporting information about the internal and external changes, for supporting risk management in decision making and for performance evaluation (Brunu et al., 2015). There is no doubt that AIT is an important component in creating value in the banking sector.

Despite the importance placed on AIT, studies have indicated that banks in Nigeria are unable to utilize or reap the benefits of their huge investments. To this end, there is need to have an integrated system that will be able to gather all customer information and manage risk and transaction information to minimize the potential risks of system failure and generate a high return to shareholders (Nwachukwu, 2010; Bruno et al., 2015). From this perspective, the success of AIT depends on the ability of the banks to integrate its systems successfully.

However, according to Dameri, Garilli, and Ricciardi (2013), there are three levels of AIT integration in organizations. One is information integration that explains that the

data collected and information produced must be managed under a unified database system. A second is operational integration, which involves the linkage of business activities of different units of the organization. The third is time integration, which allows the various units to carry out operations simultaneously. In this way the process of data entry into the system allows the user(s) to enter data once and to minimize the possibility of errors and inconsistency. Such methods enable organizations to have a clear picture of the happenings in their processing chain.

Accounting information technology has played a significant role in reforming the Nigerian banks in the process of collecting and processing information (Ayo, 2010). It offers benefits for users including accessing information not only at the headquarters or regional offices but also branches of the banks. Thus, making it easier and faster in terms of managing data and information across different levels of the banks. This enables banks to manage both qualitative and quantitative information for more effective decision making (Adewole, 2013; Bruno et al., 2015; Tan et al., 2016). From a strategic point of view, AIT makes it possible to exploit the opportunities offered by technology to expand and improve products and services offered to banks customers to increase the quality of work processes and save costs by the virtualization of banking services. Accounting information technology enables managers to have relevant and timely information for effective decision making from an operational point of view (Bruno et al., 2015).

Therefore, it becomes necessary for the banks to expand their IT in various forms more especially in AIT, to enable them to realize the optimum benefits of the systems thereby improving the quality of services offered to the customers and strengthen its local and foreign competitiveness (Alrabei, 2014). Succinctly, the preceding discussions on IT deployment in the Nigerian banking sector enable the current study to discuss the issues, definition, and importance of AIT as well as to review past literature on dependent and independent variables of this study in the following sections.

2.3 Accounting Information Technology

Recently, information technology has increasingly been used in the delivery of the different types of services. This is particularly true for the financial institutions because service delivery technology allows banks to achieve cost efficiency and overall improvement in meeting the demands of customers (Xue, Hitt, & Chen, 2011). Information technology has revolutionized ways of delivering banking services and products to customers, such as the Automated Teller Machine (ATM) and deposit machines that allow customers to carry out transactions beyond the normal operating hours. With online or Internet banking, customers can check account balances and make payments without being present at the banking hall (Aduda & Kingoo, 2012).

Accounting information technology becomes pertinent in providing bank management with the necessary information and feedback for bank value creation. In support of this view, Martins, Oliveira, and Popovic (2014) stated that the usage of IT services in

the banking industry is not only for internal operational efficiency but also for offering new products and services to customers. Thus, this enables bank customers to have unlimited access to financial information and enjoy a wider range of choices in selecting competitive products (Dauda & Lee, 2015).

Most banks adopted new technology as a result of the intense competition in the market and the desire to augment their traditional methods of serving customers. However, technology adoption or its implementation can neither increase or decrease organizational productivity on its own; only the use of this technology can (Orlikowski, 2000). On this note, Burtone-Jones and Grange (2013) claimed that IT must be used effectively to obtain maximum benefits. However, the effective use of an IT service delivery system such as the AIT available in the marketplace is a challenge facing the Nigerian banking sector (Dauda & Lee, 2015). As Aduda and Kingoo (2012) noted, AIT could only enhance banks performance through effective use of technology by users.

Despite the impressive advances of innovative technologies in the banking sector, IT is becoming an increasingly complex and important element for operational efficiency of different organizations (Dandago & Rufai, 2014; Martins et al., 2014). As such, this makes the issues of effective usage an important challenge in the AIT adoption environment, particularly for banks. According to Dauda and Lee (2015), the Nigerian banking sector is still facing the problem of the underutilization of AIT. Other issues of concern with these technologies include plastic card fraud, specifically with respect

to missing and stolen cards, and counterfeit card fraud (Aduda & Kingoo, 2012). Indeed, even some staff of banks have engaged in fraudulent transactions by crediting fake accounts with funds (Ndawula, 2010).

Mancini, Dameri, and Bonollo (2015) have claimed that such issues have arisen as a result of poor AIT integration within the adopter's environment. They further explained that the successful integration of AIT influences both the quality and the quantity of information available to support decision making and shows its overall effects on the operational and accountability processes of organizations.

In this regard, Dameri et al. (2013) stated that there are three levels of AIT integration in organizations. First, information integration is that the data collected or the information produced that are managed under a unified database. Second, operational integrations involves the linkage of business activities of various units of the organization; and, third, time integration allows different units to carry out operations concurrently. In this way, the process of data entry into the system allows the user(s) to enter data once, so as to minimize the possibility of errors and inconsistency.

Such a method enables organizations to have a clear picture of the happenings in their chains of processes. Moreover, it expands and improves products and services offered to bank customers to increase the quality of work processes and save costs by the virtualization of banking services (Bruno et al., 2015). Because AIT implementation is a complex exercise in technology innovation, it requires the synchronization of

many activities of an organization and the close cooperation with top management, employees, IT specialists, external consultants and the like to achieve the needed results (Grabski & Leech, 2007).

In summary, AITs are considered as an essential organizational mechanism that supports effective decision-making and control and have been of interest to many scholars in recent decades. Several studies have discussed AIT in different contexts; some have focused on the technical or semantic aspects and others have focused on the organizational. Although these studies have increased the understanding of the determinants of AIT usage, such piecemeal approaches might be erroneous and incomprehensive. Therefore, the current study argues that the study of AIT should be carried out from both the technical and organizational points of view. Such an approach is believed to transform the activities of doing business at the operational, tactical, and strategic levels of the banks. The next section discusses the definition of AIT.

2.3.1 Definition of Accounting Information Technology

No single or universally accepted definition of the term AIT exists as different definitions are given in the literature. At the most basic level, AIT is considered to be the logical intersection between the two main broad subjects of accounting and IT (Manteghia & Jahromi, 2012). According to Swierczek and Shrestha (2003), AIT refers to the use of computers and other ICT to collect, store, retrieve, and reproduce reliable information that increases organizational competitiveness and provides

reliable information for decision making (Tambovcevs & Tambovcevs, 2013). DeLone and McLean (1992) considered AIT as an integrated system that provides information to support business operations, management analysis processes, and decision-making functions in organizations.

Also, Nicolaou (2000) stated that AIT as a computer-based system that processes information of financial nature and helps decision makers to coordinate and control organizational activities. In their book *Measuring Information Systems Delivery Quality*, Duggan and Reichgelt (2006) view AIT as the deployment of the required software with the appropriate functionalities to assist in solving problems and adding value to the organization. Aier, Bucher, and Winter (2011) defined AIT as the “entirety of persons, business processes, and IT that process data and information in an organization” (p. 78). From these definitions, the observation can be made that the development and implementation of IT involve interactions between human (users) in the organization and technical factors like the system that work together to produce information to the decision makers.

Considering the different perceptions of AIT definition, Grande, Estebanez, and Colomina (2011) explained AIT as a tool, which if incorporated in the design of IT, enables organizational managers to monitor and control financial activities. Accounting information technology is an important mechanism in an organization that facilitates management decision making and control (Sajady et al., 2008). On this note, AIT is considered as the primary tool that produces and distributes information to

different types of users to enable adequate decision-making. Accounting information technology comprises qualified individuals, hardware, software databases and a set of procedures, which interact together to provide useful information for effective decision making within an organization (El-Dalabeeh & Al-Shbiel, 2012). Considering these definitions, AIT is viewed as a tool for capturing information and processing data by the user(s) using systems for decision-making purposes.

In addition, Dehghanzade et al. (2011) viewed AIT as a component of the organization that provides its users with warning information and information relating to financial events in the organization for control purposes. Also, Wilkin and Chenhall (2010) noted that AIT is concerned with the production of accurate, relevant, cost effective and timely information to a business to assist organizations in competing favorably in a business environment. Accounting information technology is viewed as the process of collecting, organizing, and reporting financial information (Heidarkhani et al., 2013; Muhindo et al., 2014; Amaefule & Iheduru, 2014), which has an economic value to the internal and external users of organizations (Amidu et al., 2011). The views above was further substantiated by Belfo and Trigoa (2013), who asserted that AIT is concerned with the use of the latest technology in the collection, processing, and disseminating information to managers for internal usage.

Taken together from the above definitions, the conclusion can be made that AIT is not only concerned with the provision of financial information but also non-financial information that has economic value attached to it. Moreover, it can be understood

from these perspectives, that distinctive factors separating IT and AIT definitions are unclear such that IT and AIT are used interchangeably in many studies.

Taking technological advancements into account, Andrei-Coman and Uta (2011) considered AIT as the process of gathering, processing, storing and communicating information using the latest IT. Thus, AIT is considered as the intensive use of ICT and its peripherals in carrying out business transactions and satisfying the needs of customers (Mario & Bozidar, 2012). Also, Lazhar (2012) sees AIT as all the technical devices such as databases, interfaces, and data warehouse, which organizations have deployed to collect, classify and record data and subsequently, provide useful information to stakeholders.

Looking at the stream of definitions from different researchers, it can be correctly observed that the system does not only provide information to users within the organization but also provides information to customers and other stakeholders for effective decision making. It also can be observed that the above definitions of AIT address many other concepts used in IT, which offers a more social and organizational focus.

Furthermore, it is obvious that the main focus of both terms revolves around collecting and disseminating financial and non-financial information to the targeted users for decision making. This system works together in a mutual and consistent manner to

provide current, future and historical information to end users about the organization for effective decision making (Budiarto, 2014; Bawaneh, 2014).

Based on the definitions above, the conclusion can be made that AIT is defined in different ways by different scholars. Their definitions provide explanations on the use of IT products in recording, processing and disseminating accounting information. Therefore, this current study defines AIT as the use of hardware and software application designed to implement the collection of data, measurement, and communication of information for planning and controlling the operational activities of the banks. Having discussed the various definitions of AIT, the next subsection discusses the importance of AIT in organizations.

2.3.2 Importance of Accounting Information Technology

Accounting information technology provides comprehensive guidance to organizational employees to enable them to achieve their objectives. The role or impact of AIT has cut across all the levels of management and the functional units within the organization (Abdelhak & Dalel, 2009), as well as the type of settings in which the organization is established (Mario & Bozidar, 2012). These authors further stated that AIT provides organizations with competitive advantages in two ways: 1) supporting organizational effectiveness and 2) distinction of the organization model by enabling technological and methodological innovations. According to Bach et al. (2011), AIT allows the organization to improve operational effectiveness and improve

efficiencies thereby enabling an organization to solve complex problems and help in the integration of all departments.

Deployment of AIT in government institutions enhances financial control, improves budget and economic forecasting, and increases the availability of present and past information to decision makers (Diamond & Khemani, 2005). Thus, this deployment enables organizations to make a comparison between current and previous financial positions for performance evaluation (Alzoubi, 2011). It also helps to provide timely financial information that facilitates decisions regarding fund borrowing and making financial policies (Al-Kassawna, 2012; May, Dhillon, & Caldeira, 2012). Furthermore, AIT facilitates the exchange of data between different programs; it helps in aligning the various subsystems in organizations, and, overall, it provides efficient and effective service delivery systems to users (El-Dalabeeh & Al-Shbiel, 2012; Al-khozendar, Assumpcao, & Campeanu, 2014).

The use of AIT has given organizations opportunities to perform their accounting functions effectively, to facilitate data processing, and to provide accurate financial reports for both internal and external users (Ghasemi et al., 2011). Research by Kanellou and Spathis (2013) highlighted that the efficient integration of AIT enhances the standard levels and flexibility of information generation in organizations, improves the quality of the financial reports produced, and provides timely and reliable information for better decision making within the organization (Gellinas et al., 2012; Agourram & Robson, 2012). Besides enabling organizations to evaluate their internal

strengths and weaknesses through financial reports, effective AIT facilitates communication and planning decision of organizations (Hien et al., 2014).

In addition to providing information to the organizations that facilitate decision making in difficult market conditions, accounting information technology also provides complete information for monitoring, control process and performance evaluation of the organizations (Sambasivam & Assefa, 2013). Information technology generates considerable savings to an organization by reducing overhead, transportation and materials costs. It also facilitates information processing and the overall control procedure of the organization thereby leading to increased planning accuracy and decision making of the organization (Adela, Chen, & Richard, 2008). Analyzing the role of AIT in decision making, Alkhaffaf (2012) concluded that one of the key roles of AIT was to assist decision makers in solving both structured and unstructured problems in the market environment. Therefore, the success of an organization today depends on how well it makes use of AIT in achieving its goals and objectives.

Moreover, AIT equally provides management with updated information of operating activities as well as the financial position of the organization to analyze, plan and make a correct decision. It plays a vital role in providing managers at all levels with accurate, timely and precise information to enable effective decision making in the organization (Spathis, 2006; Olumoye, 2013), thus, enabling managers to response in a timely manner to trends surrounding the organization. Accounting information technology

has equally played a vital role in improving management accounting functions and the utilization of accounting information and standards. It also facilitates organizational integration as well as empowering employees and promoting research and development in technological innovation and accounting theory (Wang, 2012; Abbasi et al., 2014).

2.3.3 Importance of Accounting Information Technology to the Banking Sector

Technological advancement has greatly transformed banking institutions, through reducing costs, facilitating growth and development as well as the sustainability of financial institutions. In such a situation, investment in AIT should form an integral part of the overall strategy of banks to ensure effective performance (Yang, 2008). Specifically, Fengyi, Olivia, and Sheng (2005) maintained that AIT plays an effective role in enhancing modern organizations especially in the banking sector through providing an integrated value chain system, rapid financing services, excellent fund allocation and payment, global capital logistic services and cost savings compared to traditional bank accounting information. Furthermore, it provides the enabling environment that supports bank information exchange, integrates the flow of information (internal and external) and links to a supply chain platform. This has greatly enhanced the relationship between bank and users; thus, researchers have concluded that the use of AIT has enhanced the computing power and standardization of organizational activities, simplified multiple business transactions and led to the provision of more accurate and timely information to the various users (Madininos et al., 2012; Rodriguez & Sprakman, 2012).

Similarly, AIT improves the quality of products and services, reduces waste of materials, and facilitates knowledge sharing, planning of marketing and sales operations as well as comparison and future analytical provision in the banks. Besides providing employees with complete information about customer transactions across the different interface, higher system quality enables quick and prompt responses to customer needs and helps in minimizing uncertainty. Thereby, this enables banks to satisfy their customers' demands efficiently and with less effort, which eventually increases a bank's competitive advantages (Hsueh-Ju et al., 2012; Bawaneh, 2014).

Accounting information technology provides banks with problem-solving facilities of the online real-time system, monitoring of the supply chain process, helps bank employees in the rationalization of their daily administrative functions as well as alerting banks in the event of financial integrity and internal control weaknesses. Accounting information technology improves internal control system, organizational structures, administrative processes, departmental coordination and the overall accounting systems (Sisaye & Birnberg, 2010; Al-Swalhah, 2014; Alrabei, 2014). On the same note, Kaka and John (2010) and Balasubramanian et al. (2014) contended that an effective AIT serves as a mechanism that enables banks to manage their resources effectively, provides banks with an efficient service delivery system for existing customers and has the potential to attract new customers. In addition, through the effective usage of AIT, it is possible for banks to speed up the transmission of messages relating to funds transfer for a different or the same bank and provides

customers with a wider range of products and services particularly in self-service banking (Brunu et al., 2015). Thus, this minimizes time and streamlines the processes of conducting businesses. This technology is designed to support different situations that enable organization to achieve business strategies and easily adapt to changes in market environments with cost savings and few human errors (Mancini et al., 2016).

Therefore, based on the above review the conclusion can be made that the use of AIT enables organizations to understand the nature of their problems deeply and provides them with adequate information for effective decision making. Following the discussions on the importance of AIT to organizations in general and banks in particular, the next section discusses the determinants of AIT usage.

2.4 Determinants of AIT Usage

Today many organizations have recognized the significant contribution of AIT usage to business operations effectiveness. Accounting information technology plays a vital role in creating competitive advantages and business sustainability, which has left businesses with no other option than to integrate AIT into their daily routines operations to save costs, enhance service delivery quality to customers, and increase profitability as well as market share.

To investigate AIT investment in organizations, different measures have been used by researchers to evaluate AIT usage. For example, Grover et al. (1996) stressed the need for an organizational perspective, which implied justifying the investment in IT by

organizations in terms of achieving the expected benefits. Furthermore, cost-benefit analysis, user satisfaction, incremental performance in decision making, system usage estimation and information characteristics are some of the approaches used by previous researchers in measuring AIT usage.

However, the available evidence from previous studies have indicated different results regarding the influence of AIT in various organizations (Coe, 1998). While some studies have indicated either a weak relationship or no relationship between determinants of AIT usage, other studies have indicated a strong and positive relationship, which led to improvement in organizational performance. One possible reason for the variance in the results is that the concept of usage is value-laden and subjective (Ozkan, 2006). Therefore, the consideration of key determinants is important in describing the current study framework.

For example, Hou (2012) found a significant and positive relationship between end user satisfaction and system usage. The results further indicated that a higher level of user satisfaction can lead to higher system usage, which eventually translates into individual performance. However, this study focused on evaluating individual user usage of the technology rather than on evaluating the organizational outcomes of AIT. Similarly, in an attempt to understand factors affecting the AIT usage in private higher educational institutions, Abu Taber, Alaryan, and Abu Haija (2014) examined the impact of human resources, hardware, and software, using a survey research design. The results showed that the human resources, hardware and software have a positive

relationship with AIT usage. The study concluded that companies with qualified human resources are bound to have a better AIT. An evaluation of factors affecting AIT effectiveness was conducted by Al-Oleemat (2014), using the economic theory of production. The study revealed a significant relationship between AIT effectiveness and human capital (knowledge, creativity, and skills). This implies that the effective usage of AIT is linked with a combination of technical, semantic, and social organizational factors.

Unlike, Abu Taber et al. (2014) and Al-Oleemat (2014) who used a quantitative research approach to examine factors affecting AIT usage, Bentley et al. (2013) used action research based on a critical-systems thinking approach to evaluate the IT usage in a United Kingdom higher education institution. A semi-structured interview was designed to collect responses from the respondents. The study identified low data quality, lack of system specification, lack of communication within the system, inflexibility of the technology and poor system management as the causes of IT ineffectiveness (failure). Nonetheless, the findings of this study cannot be substantiated as the qualitative approach is prone to generalization problems. Hence, a need exists to carry out quantitative research to authenticate the findings.

Another study faced with generalization issues is that of Kanungo et al. (1999), a survey comprising 40 organizations across different sectors was conducted to evaluate AIT usage. The study interviewed CEOs, IT managers and users. An interpretive structural modeling was used to determine the causal relationship between the factors

identified in the study. The results indicated that facilitating information retrieval, improving product and services quality, and minimizing errors in functional areas have significant influences on IT usage. Furthermore, the study revealed that improving system integration is the most influential factor that leads to the IT usage. This study focused on the views of internal stakeholder's views in addition to the qualitative approach used. However, the qualitative findings of study may not be applicable unless proven empirically.

In contrast to Kanungo et al. (1999), Pather, Erwin, and Remenyi (2003) developed a model to evaluate factors for IT usage in the South African context. The study concluded that user satisfaction and service quality were the most influential factors for AIT usage in organizations. Similarly, Malik (2001) designed a model to investigate IT usage based on integrated perspectives. The study revealed that AIT usage could only be achieved through an integrated approach by considering products, process, and environment perspectives. The author claimed that the successful application of the model would result in greater effectiveness of the automobile industry in India. Though these studies have increased the understanding of the success factors, they focused on general IT. Thus, a need exists for a deeper understanding within a specific IT context like the AIT.

Moreover, based on stakeholder's approach, Seddon et al. (2002) explored IT usage in both Europe and the United States. The survey instruments of the study were mailed to top management of medium and large firms in both regions under study. The

findings indicated emergence of three (3) group of constructs: 1) systems quality and information quality, 2) perceptual measures on net benefit about IT use and 3) IS behavior. Supporting Seddon's stakeholders' perception, Elpez and Fink (2006) used a similar approached to determine IS success factors in three major Western Australian organizations. The study developed a model based on user requirements, information quality, system usability, expenditure control, interaction with IT infrastructure, accountability and user acceptance. These studies further provide a basis for evaluating AIT usage in organizations over time. But their study did not include a discussion on the organizational factors that are key drivers for effective AIT usage.

Using stakeholder's theory, Chalu (2012) assessed factors that influence AIT usage in Tanzanian local authorities. Purposive sampling was adopted in the study, and the data that were collected from the survey were analyzed using descriptive and inferential analyses. The results of the study indicated that management support, external auditors, specialization and councilor's involvement are the most important determinants of AIT usage. The study concluded that, for organizations to achieve effective AIT usage, they must deploy AIT in all their operational activities as well as allocate adequate resources for the implementation of the systems. It is notably clear that AIT usage is directly related with the effectiveness of the internal organizational factors and DeLone and McLean's quality measures.

Another study with questionable generalizability is that of Hien et al. (2014); their results supported the previous findings of Seddon et al. (2002) on the similar AIT

usage study. The study further revealed a strong correlation between the use of IS and users' satisfaction, which positively influenced the perception of the stakeholders. These studies lacked theoretical support, and the items were measured at once. In concordance with the above findings, Ramezan (2009) investigated IT usage in the Iranian oil industry. About 163 valid responses were collected and used for analyses in the study. The study found a significant relationship between system quality, information quality and system use with IS usage.

Further validation of the DeLone and McLean model was carried out by Gorla, Somers, and Wong (2010). Using survey data collected from organizations in Hong Kong, the study revealed that information quality, system quality, service quality have a significant and positive impact on AIT usage. The study concluded that information quality and service quality are the most influential determinants of IT effectiveness in organizations. In the same vein, Shih and Lin (2011) examined the negative frequency of system quality, information quality and service quality with user satisfaction in Taiwan hospitals. It was found that all the three factors were not significant. The study was only able to explain about 16% variance, indicating that 84% of the variance was unexplained. Therefore, a need existed for more study in different contexts so as to verify the findings.

In their investigation of the ownership effect on AIT success factors in organizations. Alshawaf and Khalil (2008) concluded that of the ten variables studied only IS sophistication, end user satisfaction, IS strategy and resources, IS organizational level

and user involvement were found to be effective as successful factors and thus, improve the efficiency and effectiveness of the organization as well as the decision-making process. However, the study focused on individual user acceptance of the technology rather than on evaluating performance outcome. Ortiz, Kelley, and Hunter (2007) extended the IS effectiveness model of Singapore to Canada. The results indicated that managerial support and vendor support have a significant effect on technological usage for small businesses in Canada.

Accordingly, Khalil and Elkordy (2001) evaluated IT usage in Egypt. The survey instruments of the study were distributed to 120 bank managers in 22 banks. The results revealed a positive relationship between age, users' involvement and tenure in office with IS usage dimension (user satisfaction). Furthermore, the results showed that age, organizational level, and education had a negative relationship with the IS effectiveness dimension (usage). Nonetheless, the study follows the same trend in sampling managers only. Thus, the findings may be biased and also prone to generalization issues.

In a closely related study, Cho (2007) focused on the impact of organizational learning on IS usage in Hong Kong. A quantitative research approach was adopted, and managers and other high-ranking employees were the respondents of the survey instruments. The results of the study indicated that management support and training have a positive impact on technological usage. Supporting Cho's (2007) findings, Hamdan's (2004) study adopted a balanced scorecard approach in analyzing the data.

The results of the study suggested a significant relationship between top management support and organizational learning (training) with AIT usage. The study concluded that substituting decision performance with user satisfaction and usage measures for AIT should be treated with utmost care.

Maditinos et al. (2012) attempted to evaluate how internal organizational factors influence IT usage. About 361 survey instrument was administered to managers in organizations, 112 valid questionnaires were collected and analyzed using SPSS and LISREL. The empirical evidence revealed that top management support, users' support, and external consultant supports have a significant and positive relationship with IS usage through communication effectiveness. The study further revealed that only knowledge transfer and consultants support could directly influence IS usage. However, limitation of this study, which the author has acknowledged, was the small sample size, which was 118.

Contrary to the above study that focused on organizational and individual factors, Gounaris and Panigyraka (2007) aimed to design a model of IT usage that assessed both internal (market procedural improvement, and employee's knowledge) and external factors (customers' knowledge and market responsiveness). A survey instrument was administered to the respondents, and the data collected were analyzed using SEM. The results indicated that both the internal and external factors of organizational have a significant impact on the effective usage of IS in organizations. Whilst their results provide further evidence for the need to evaluate internal and

external factor determining AIT usage, they did not include any discussion on the technical factors that may influence AIT usage. Thus, there is need for more studies that will integrate both factors.

On the same note, other variables influence AIT usage and subsequently to organizational performance were investigated by Abdallah (2013). These variables were qualified human resources, an advanced computer system, and good control systems. The survey instruments were administered physically to employees of revenues offices in Jordan. Based on the survey results, all variables had a significant influence on AIT, which resulted in a positive impact on revenue generation of the organizations. Nonetheless, despite Abdallah's (2013) significant findings, the results of the study are prone to generalization issues because of the small sample size. Therefore, the need exists to consider a large sample size.

More than a decade ago, Nicolaou (2000) empirically examined the influence of AIT design (AIT integration) on perceived usage in sampling 600 organizations. The results indicated that the alignment between contingent variables and AIT design as well as the requirement for control and coordination within the organizations have a significant influence on AIT usage. The weakness of the study, which the author acknowledged, was the measurement of all the research variables at a single time. Saliem, Ashour, Khalil, and Millar (2003) collected 214 survey instruments from managers in organizations to explore the influence of organizational factors on AIT usage in Egypt. The results indicated a strong and positive relationship between

management support, user involvement and the IS maturity function with AIT usage. The authors concluded that results obtained in the study contributed both to the external and international validity of Western findings. Though the study has contributed to AIT literature, it only considered three organizational variables.

In addition, Rini and Nunuy (2014) explored the impact of organizational commitment and IT infrastructure on AIT usage. They found that organizational commitment and IT infrastructure have a significant influence on the effectiveness of the system. However, the study was based on content analysis. Thus, the findings cannot be substantiated, unless proven empirically. Similarly, using mixed research approach, Rahayu (2012) investigated the interactive effect of AIT with management commitment and data quality in Indonesian public organizations. The study found that both management commitment and data quality significantly affect AIT. The study focused only on 38 offices as the sample size, which does not give an appropriate representation of the total population. Hence, the findings are prone to generalization problems.

Based on DeLone and McLean, the diffusion of innovations and resource-based view theory, Ismail (2009) examined AIT usage and its influence on SMEs in Malaysia. SPSS was used to analyze the survey data collected. The results revealed that managerial accounting knowledge, the effectiveness of accounting firm and vendors have a significant influence on AIT usage while AIT sophistication, managers AIT knowledge, government agencies and consultant effectiveness had an insignificant

relationship with AIT usage. One limitation of the study was the analyses technique adopted, and thus the author called for the future study to use better tools as well as verify the current findings. In contrast to Ismail's (2009) findings, Khassawneh (2014) evaluated the influence of organizational factors on AIT in Jordan SME's. The study's findings suggested that AIT sophistication, managers' tenure, firm size and internal experts had a significant relationship with AIT usage. However, the study was based on a content analysis, and therefore, may not be applicable unless proven empirically. Thus, the current study will address this issue.

Unlike Khassawneh (2014) who documented his findings based on content analyses, Nabizadeh and Omrani (2014) empirically examined the relationship between external and internal consultants, firm size and managerial knowledge of AIT usage. A clustering sampling method was used in administering the survey instrument. Data collected from managers were analyzed using descriptive statistics, and t-tests were conducted to test the research hypotheses. The results of the study indicated that a significant relationship existed between external and internal consultants, firm size, and AIT usage. The study provides further evidence for evaluating AIT usage in organizations. However, they targeted only top management as respondents of the survey instrument while ignoring other employees who carried out the operational activities of the organizations.

Bach, Belardo, Bajwa, Kantharaju, and Prasanth (2011) conducted a further expansion of the DeLone and McLean model of 2003. The study evaluated the influence of user

perceptions on AIT usage. User feedback and technology partner were used as antecedent variables, and the independent variables of the study were information quality, system quality, and service quality. Furthermore, intention to use and user satisfaction were used as a moderator. The empirical results indicated that system quality, service quality, and information quality have a significant relationship with AIT. The study concluded that the constructs enable the organization to plan and facilitate decision making. In support of these findings, Shiri (2012) concluded that the use of AIT systems has facilitated the routine functions of employees and assisted in providing readily and timely information for decision making. A further expansion of DeLone and McLean model in a BI environment was conducted by Tona, Carlsson, and Eom (2012) who used a mixed research approach in their study. Of the 367 online responses received only 103 were found to be valid for analyses after cleaning and handling of missing values. The overall findings of the study showed only five of the eight relationships tested were significant. System quality and information quality were found to influence users' satisfaction. Moreover, system quality influenced use and users' satisfaction, which ultimately influenced individual impact. However, no relationship was found with the other constructs.

Ahmad et al. (2013) examined AIT usage in relationship to data quality, stakeholders, and audit issues. The findings of the study revealed that, for successful implementation of AIT, both the system and organizational factors must be considered. The study suggested that future research consider the effects of other organizational factors on AIT for better understanding. In a closely related study, Lam, Than, and Pham (2014)

investigated stakeholders perceptions on some key attributes of IS effectiveness in the organization. They found that system quality and service quality had a significant influence on technology usage, which ultimately has a positive effect on the perceptions of the stakeholders.

Similarly, Al-Qudah (2011) examined the impact of AIT usage on the effectiveness of internal control in Jordanian commercial banks. Descriptive survey research was used and the data collected from bank employees (control department) were analyzed using SPSS. The findings of the study indicated that AIT has a significant relationship with the effectiveness of internal control in the banks. He concluded that AIT has a positive impact on internal control, enabling banks to generate more accurate and timely information for strategic and operational decision-making. Alshbiel (2013) aimed at identifying the risks of communication between the internal control and computer departments and their impacts on the efficiency of the AIT at the commercial banks. The descriptive analytical approach was used in analyzing the survey data collected from employees (internal control). The results revealed a significant effect for risk of communication between the IT unit and internal control on the efficiency of AIT in the banks. The results further revealed that all the dimensions of internal control (centralization of decision, external environment and inadequate laws and legislations) had a positive influence on the efficiency of AIT in Jordan commercial banks. One limitation of the study was a lack of theoretical support, thus making the findings prone to generalization issues. Based on the preceding discussion, the observation can be

made that most previous studies are descriptive in nature and use simple statistical analyses technique, and thus lack rigor.

On the same note, Alzoubi's (2011) study involves financial managers and accountants of organizations in Jordan. The study aimed at determining AIT usage in an ERP adopted environment. The empirical evidence showed that information quality and internal control have a significant influence on AIT. The author concluded that the integration of AIT has led to a significant improvement in the quality of information produced and the internal control of banks. Nevertheless, the study lacked a theoretical basis, and the sample size of the study was small. Thus, the research findings are prone to generalizability issues.

Hayale and Abu-Khadra (2006) investigated the level of internal control effectiveness of AIT in banks. A survey instrument was administered to staff (head of the internal audit and IT unit) at the headquarters of Jordanian domestic banks. Data collected were analyzed using simple percentages and Z-tests. The results indicated that banks used effective fraud and error reduction control measures on the one hand but do not have effective control measures on the other hand. One possible limitation is that the researchers focused on bank headquarters, which are mere policy makers. Thus, the need exists to consider the policy implementers (bank branch) and employ an alternative approach as well as an integrated model to investigate the relationship.

In contrast to the qualitative methods adopted by the most researchers, Mashour and Zakaria (2008) evaluated AIT usage in banks using a mixed research approach. The findings indicated that AIT had a positive and significant impact on the banks, which eventually increased their competitive advantage in the sector. Also, Al-Swalhah (2014) found that AIT had a significant role in the rational administrative decision-making process in commercial banks. In addition, empirical evidence revealed that AIT enables banks to integrate all their functional units, thus leading to more speed and greater accuracy in banking operations (Wedyan, Gharaibeh, Abu-dawleh, & Abu Hamatta, 2012). Although the study achieved its objective, it lacked theoretical justifications, and all the measurement items were analyzed at one time. To overcome analytical hurdles, this current study will use better analysis techniques such as PLS.

Using random sampling techniques, Sajady et al. (2008) examined the influence of financial reporting, decision making and performance on AIT usage in Tehran financial institutions. The empirical findings revealed a significant relationship between better decision making, effective internal control, quality of the financial report and the enhancing of financial transaction with AIT while no relationship could be found with performance improvement. However, one limitation of the study was that the respondents included only managers ignoring other stakeholders such as CIOs and accountants, who have better knowledge of how such a system functions. This might be the reason for finding no relationship between AIT and performance improvement in the study.

Recently, Shatat, Yusof, and Abdulaziz (2013) distributed about 500 survey instruments to top, middle and lower-level managers in Jordanian banks and 386 valid responses were returned. The study explored the impact of system quality, information quality and service quality on business intelligence system usage. Descriptive statistics were used to analyze the data. The results indicated that information quality, system quality, and service quality had significant influence and increased the effectiveness of business intelligence systems in banks.

Khatab (2002) evaluated the impact of organizational, behavioral and environmental factors on AIT efficiency and effectiveness in Jordanian commercial banks. The results revealed that all the factors had a significant influence on AIT usage. The findings further revealed that environmental factors such as auditing and accounting standards had the highest influence on AIT usage in banks. Additionally, Adel (2005) focused on 23 financial institutions (including banks and insurance companies) listed on the First Market in Amman Stock Exchange to evaluate the impact of IT on AIT usage. The study developed and distributed questionnaires to the financial and IT departments of these organizations. The findings of the study indicated that IT had a significant influence on AIT.

Muhammad and Zakaria (2007) examined AIT usage in Jordanian commercial banks by focusing on system dimensions of quality, flexibility, simplicity and confidentiality. The study collected and analyzed about 42 valid questionnaires. It was found that the AIT of the banks was of high quality, flexible, reliable and simple. More

recently, Almbaidin (2014) investigated AIT usage in private banks in Jordan based on management perceptions. A survey research method was employed, and the survey instruments collected were analyzed using descriptive statistics. The empirical evidence showed that AIT usage met the requirement of planning, observation, and decision-making process of managers in banks. The study concluded that the application of AIT at the different organizational level would improve the decision-making process. However, the study focused only on the managerial level of AIT usage ignoring other stakeholders; moreover, the study lacked a theoretical support in addition to insufficient analysis techniques in the data analysis process.

In summary, the literature above clearly indicated that AIT could be applied in different sectors of the economy. Most literature focused on organizations in general, while others that focused on the banks tended to focus more on AIT usage in relationship to the internal control of the banks. Another stream of studies considered either the technical, organizational or environmental factors in assessing the determinants. Undoubtedly, these studies have increased the understanding of AIT usage in both organizational and individual levels. Nonetheless, the preceding review shows the inconsistency of findings on DeLone and McLean quality-related factors.

One reason for this is that they suffered from several limitations. First, many studies focused on only one, two or three constructs, which resulted in a fragmented understanding of AIT usage. Second, many previous studies directed more attention to evaluating general IT/IS than to focusing on specific technology such as the AIT.

Third, these studies often had small or non-inclusive samples. Fourth, they often used insufficient data analysis with simplistic analysis techniques.

Nonetheless, these studies do provide more evidence on the influence of system quality, information quality, service quality, internal control quality, training, top management support and external consultant involvement on AIT usage in organizations, specifically banks. Hence, the next section further discusses key determinants of AIT usage.

2.4.1 System Quality

The construct can be traced to DeLone and McLean's IS success model (1992; 2003), which has been adopted by many studies in IT and other related contexts (Elpez & Fink, 2006; Ramezan, 2009; Hien et al., 2014). Researchers have developed different approaches on how the system quality construct should be conceptualized and evaluated. From the perspective of the system developers, system quality has been conceptualized based on the intrinsic attributes of the software (Ravichandran & Rai, 2000), while the DeLone and McLean model (1992) proposed system quality as an overreaching construct representing the technical level of the system. System quality has been considered as an important factor in determining AIT usage in organizations. For example, Nelson, Todd, and Wixom (2005) used system quality to measure the information processing system itself with an emphasis on flexibility, reliability, system integration and response time concluding that having a good system is key to achieving IT effectiveness. In line with this, Wongsim and Gao (2011) stated that

system quality dimensions in AIT provide managers with information for decision making in organizations. Thus, system quality should be considered in AIT adoption to improve system usage.

A high-quality system can be of great benefit to the banks because it can assist in providing an understanding of the context, reducing costs and increasing productivity as well as facilitating decision making, which leads to the achievement of goals and objectives (Wixom & Todd, 2005). Conversely, poor system quality can be detrimental to the banks at the operational, tactical, and strategic levels (Taif, Aman & Abdul Aziz, 2014). Previously, a number of studies have investigated the relationship between system quality and IT in different contexts. However, definite conclusions are rarely reached in their results due to differing metrics used in the measurement of the construct, which leads to difficulty in interpreting the results.

Although the system quality construct was conceptualized as a composite concept in DeLone and McLean's Model (1992), previous studies normally used it as a reflective indicator to measure the construct (Argyropoulou, 2011; Bach et al., 2011; Shatat et al., 2013; Hien et al., 2014). However, an incorrect specification of the measurement model might lead to biases in assessing the structural model, and thus making interpretation of the results difficult (Petter, Rai, & Straub, 2007). Considering the various specifications in previous studies Wixom and Todd (2005); Saha et al. (2012) and Chang, Chen, and Lan (2012) developed a multidimensional approach so that the system quality construct could be treated as a second-order formative construct.

System quality is concerned with the technical efficiency of the system in terms of user interface consistency, ease of use, programming error and maintainability of the system. The system construct was conceptualized as a second-order formative construct in the current study and measured with the three dimensions of security, ease of use, and efficiency, which are all adapted from Chang et al. (2012). Ease of use measures the extent to which the system user(s) perceive the system to be user-friendly. Security is concerned with the ability of the system to provide services that prevent virus attacks and unauthorized access to the system. Whereas, efficiency is concerned with the extent to which user(s) perceived the system to be helpful and enhanced efficiency. The rationale is that a good system would lead to increased AIT usage.

2.4.2 Information Quality

Similar to system quality, information quality can also be rooted to DeLone and McLean's Model. Over the years studies on information quality have increased significantly to meet organizational needs. Organizations today, most especially banks, are concerned with the quality of information that they capture to ensure that the information produced by the end user will assist in increasing the effectiveness of banks (Shatat et al., 2013). Nonetheless, different researchers have tried to either define or have grouped information quality in varieties of ways. Their definitions fall under the intrinsic, contextual, representational, and accessibility views (Richard, Wang, & Strong, 1996).

The intrinsic perspective showed some measures of agreement between the value of information presented by AIT and the actual values of the information in the real world. However, this perspective is considered insufficient because it treats information as an object that could be assessed separately from the context in which it can be applied (Nelson et al., 2005).

According to the context-based perspective, information quality is viewed in relationship to the extent in which information is used to achieve a certain task. While the representational and accessibility perspective views that information quality measures the extent to which the information presented effectively facilitates understanding and interpretation.

Although scholars tend to disagree on the representational lists of preferred information quality attributes (Wang & Wang, 1996; Wang & Strong, 1996), a general consensus exists that accuracy, relevancy, timeliness and completeness are the commonly used measures of information quality (DeLone & McLean, 1992; 2003). However, measuring the information quality construct has been difficult because of divergent views of how the construct should be operationalized and what it consists (Redman, 2005). Most of the information quality measures focus on the output produced by the system, the value derived, and usefulness or its relative importance as perceived by the user. Despite the conceptualization of the information quality concept as a composite construct by DeLone and McLean (1992), past studies usually treat this construct reflectively, therefore, leading to the wrong specification of the

measurement model, which might lead to biases in evaluating the structural model (Petter et al., 2007). Information quality has been described as the ability of the system to provide timely, accurate, relevant, and complete information to the user for effective decision making. Therefore, this definition combined the categories of information quality perspectives. The construct was operationalized as a second-order formative construct and measured with three first-order dimensions; accuracy, timeliness, and completeness (Saha et al., 2012). Accuracy measured the correctness of the output produced by the system. Timeliness refers to the extent to which the information is made available at the right time that is needed by the user(s). Completeness measures the extent to which the output is relevant and satisfies the needs of the user(s).

Thus, information quality should be intrinsically good, contextually appropriate in achieving the needed tasks and clearly presented to the user for effective decision making in the organization. The literature review on the effects of information quality on AIT usage provides a strong argument that producing qualitative information improves the decision-making process in organizations, thereby, leading to AIT usage (Corina & Nicolae, 2012). Kathiravan et al. (2003) contended that information quality remains an important tool for achieving organizational success. Conversely, poor information quality could lead to negative and significant social and economic impacts to the organization (Richard et al., 1996).

Accordingly, it is necessary for organizations to understand information quality issues before implementing AIT application. Information quality is an important issue that

needs to be properly managed (Hongjiang et al., 2003). Corina and Nicolae (2012) concluded that information quality becomes an intrinsic part of IS and is an important tool that results in organizational success. Also, Emeka-Nwokeji (2012) studied indicated that good information quality reduces costs and increases organizational performance. In the same vein, evaluating the effect of IT on information quality of banks in Nigeria, Imeokparia (2013) found that the use of IT has enabled banks to produce more accurate and usable information for decision making. Supporting the above findings, Jung and Olfman (2005) found that information quality enhances decision-making effectiveness and decision quality in organizations. Moreover, information quality reduces the number of errors produced during organizational transactions and reduces the circumstances in which users only make use of the information produced by AIT as raw materials that will be transferred to other applications for further manipulations (Ferneley & Sobrepez, 2006).

2.4.3 Service Quality

The existing literature proposed service quality as an important factor to IS effectiveness and has tested the 22 measurement instruments of SERVQUAL, which originated in the field of marketing in the context of IS studies. Considering the role that the IS department plays within an organization through the provision of a service function to its organizational customers, scholars in the field of IT deem it necessary to adapt the SERVQUAL to the organizational context to measure IT effectiveness (Jiang, Klein, & Crampton, 2000; Pitt et al., 1995). The DeLone and McLean Model of 1992 was re-specified in 2003 to incorporate other important quality success

dimensions of service quality because previous studies had advocated that evaluating AIT usage would be incomplete when the services delivered by IT department are not considered (Wixom & Todd, 2005; DeLone & McLean, 2003).

The emergence of service quality in AIT study and its roles in organizations has attracted more attention over the years in the literature; yet, its relationship with other constructs of IT success is not well understood (Pitter et al., 2013). One possible explanation for this finding may be due to difficulty in defining or the inappropriate use of measurements for the concept (Pitter & McLean, 2008). Service quality measures all the support delivered by the IT department, and service quality is considered to be the main ingredient that strengthens the relationship between organizations and its' employees, which eventually translates into increased sales and profitability.

DeLone and McLean (2003) claimed that service quality is an important dimension for e-commerce environment, and SERVQUAL instruments are the most useful indicators for an organization that is trying to identify areas of needed service improvement and AIT usage measures (Jiang et al., 2000). To measure only the usage of a single AIT, system quality and information quality may be important factors, but, to measure the overall IT usage, service quality may be the most important factor (DeLone & McLean, 2003). Thus, service quality is a driver of perceived value, which can improve the loyalty of an organization's customers and enhance banks image.

Service quality relies on individual participation within the organization and the availability of the AIT that can assist in motivating and monitoring such individuals (Pitt & Wattson, 1995). It is the overall support delivered by the IT unit of an organization (DeLone & McLean, 2003). Ankrah (2012) explained service quality as the distinction between expected service quality and the perceived service received by the users. Rachmawati and Lasniroha (2014) believed that the satisfaction of IT users depends on the quality of service provided, which eventually affect the decision making and the bank's performance. Users' performance evaluation can be done by comparing user expectations about the service, and the real service experienced. When the real service is greater than expected the service is excellent and, if otherwise, the service quality is poor (Hien et al., 2014). Employee satisfaction with the quality of service offered by AIT indicates that the organization is managed and operated efficiently.

This study defines service quality as the degree of responsiveness, assurance, and empathy of the bank IT units that support the efficient operation of the systems, which is the result of AIT usage in a bank. Kwan (2006) operationalised service quality as a reflective construct and measured it with three first-order dimensions, namely, responsiveness, assurance, and empathy. Responsiveness measures the extent to which the system response rapidly to the demands of user(s). Assurance refers to the knowledge and courtesy of employees (IT unit) and their capability to inspire trust and confidence by system user(s). Empathy is concerned with individualized attention that the service unit staff offer to the system user(s).

Kettinger and Lee (1995) contended that service quality in IS focused more on user satisfaction, which enables the user to achieve organization goals and objectives. Thus, this assures having adequate support from the IT unit personnel in the event of any problems through an excellent relationship with users promptly. User(s) may be motivated to learn and explore more functions of the system. Therefore, service quality is a useful and valid measure of AIT usage that improves the operational efficiency and profitability of the banks.

2.4.4 Internal Control Quality

The rapid development of IT and the intense competition has made organizations, most especially banks, adopt AIT to survive and remain competitive. However, the threats related to AIT are increasing in today's dynamic environment (Rajeshwaran & Gunawardana, 2013), which has brought about many challenges particularly in internal control effectiveness that is normally related to fraud (Ekwueme et al., 2012). Acklesh, Peter, and Jon (2013) said that the complex nature of business transactions implies that AIT face threats of being manipulated to manage activities that are contrary to the assumptions of the real world. They further stated that this situation might have adverse effects on the relationship between internal control quality and AIT usage. Therefore, AIT needs to be part of the dynamic nature of the environment and must be able to detect possible threats of irregularities.

Hall (2011) stated that a good internal control structure should protect the AIT from problems such as fraud, error, and issues related to system failure. In view of the above argument, Stefanoul (2012) contended that the lack of internal control affected AIT usage in organizations. In a similar vein, Abu-Musa (2006) revealed that many organizations are suffering from both internal and external financial losses due to an ineffective internal control system. In this situation, having an adequate control environment and control activities to prevent undesirable practices in business and reporting is necessary for the success of the organization.

Bodnar and Hopwood (2010) stated that internal control is a process designed by an organization that provides reasonable assurance in terms of achieving their goals and objectives in the following areas: reliability of financial reports, efficiency and effectiveness in transaction processing, and compliance with relevant laws and regulations. For transaction processing, internal control quality is categorized into general control and application control (Bodnar & Hopwood, 2010). Application control is designed to control all accounting technology to ensure accuracy and completeness of transaction processes. General control is further divided into input control, preventive control, detective control, and corrective control. Bodnar and Hopwood's further explained that input control measures should be specifically designed to protect or detect possible errors in data input stage and transaction processing. Preventive control is the act of preventing fraud or error before their occurrence. Detective control is the measured use in finding fraud or error after it has occurred. The corrective control is the action taken to correct errors (Bodnar &

Hopwood, 2010). Al-Qudah (2011) stated that the use of AIT has the potential for improving the internal control and safeguarding the assets of commercial banks. Similarly, Toposh (2014) contended the qualitative characteristics of AIT could be maintained with an effective internal control system within the organization.

In addition, Warren (1999) concluded that internal control policies and procedures should protect from the misuse of organizational assets and ensure the accuracy of financial information and compliance with relevant laws and regulations. Internal control is a process that is influenced by the internal management of an organization, which provides reasonable assurance of its operational efficiency and effectiveness (Ramdany, 2015).

Therefore, the current study views internal control quality as the mechanism adopted by banks to safeguard and evaluate the accuracy and reliability of its accounting information technology that ensures the operational efficiency of the banks. Thus, quality internal control enables banks to generate more accurate and timely information for strategic and operational decision-making.

2.4.5 Training

Training has been widely studied in many disciplines and is recognized as one of the most effective ways in which organizations can overcome challenges related to new technology. Issues regarding technology failure, perceived difficulty, and poor output can be resolved through a qualitative training of the employees to provide natural and

reliable responses to these challenges (Thong et al., 1994). Nonetheless, developing countries such as Nigeria have failed to achieve the desired outcome of IT due to a lack of employee training (Ajami & Bertiani, 2012; Ahmed & Mhamed, 2014). The lack of training of AIT users results in a longer implementation period, adaptation difficulties and increased frustration (Vaughan, 2001). Bhatti (2005) argued that one main reason for training is to familiarize employees with the IT and to enhance their understanding level and expertise with the systems. Therefore, the conclusion can be made that training has a considerable influence on employee performance, which eventually affects the organization in general.

Thus, this study defines training as the extent to which employee skills and knowledge acquisition programs assist them in understanding how important the technology is, and how that technology relates to their work and other functional areas within the organization so as to contribute to AIT usage. In line with this, Elnaga and Imran (2013) defined training as a program that provides workers with information, new skills or professional development. Regular training of the employees enhances their understanding of the technology thereby enabling them to achieve organizational goals (Coman & Coman, 2013). Training is one pervasive way of enhancing employee productivity and communicating organizational goals to a new employee (Gupta, Bostrom, & Hober, 2010).

Adams, Adegoke, and Afolabi (2013) claimed that, for banks to solve the problem of technology failure and to achieve the required efficiency and operational effectiveness

of their IT, they must train operational staff. Also, Ike and Odetayo (2014) maintained that training of employees on how to utilize new technology could increase the effective use of the technology. Also, Chang et al. (2012) opined that only when the AIT users understand how the technology functions and the objectives that the AIT is set to achieve the IT, that they can optimize their effectiveness. In support of this, Bawaneh (2014) emphasized the importance of staff training in banks for effective IT usage.

Emeka-Nwokeji's (2012) study asserted that regular training of employees reduces the cases of poor information quality and enhances organizational performance. Kan et al. (2012) argued that training of related employee improves their computerization skills and enhances computer knowledge. In addition, analyzing the mediating role of employee training and organizational performance, Shaheen, Naqvi, and Atif (2013) claimed that the training of employees enhances their knowledge and information of a particular field such as AIT and also increases organizational effectiveness. Also, effective training of the employees on using new technology eases accessibility and promotes the relevance of information about the employee's job, which will translate into higher accuracy, speed, and precision of their daily operations (Ramezan, 2009). Conversely, a lack of training would have a negative effect on the quality of information produced thereby causing a delay in decision making in the organization (Raza, 2014). Therefore, the conclusion can be made that adequate training of the employees will help them to understand the technology properly, which can lead to the realization of AIT benefits, thereby addressing the problem of persistent failure.

2.4.6 Top Management Support

Top management support construct has gained wide consensus in the literature as a key factor in AIT usage because they finalize the budget to support IT implementation. Top management also decides on when and how AIT should be implemented and dictates the level of cooperation as well as the support that should be provided by the different departments when AIT is launched within an organization (Chow, 2008). Schwalbe (2010) maintained that top management support is vital for the success of an AIT project based on providing the necessary resources, ensuring the proper integration and implementation of the project and giving appropriate guidance to the project manager.

Top management support refers to the extent to which bank managers provide funds, guidance, and other resources needed before and after implementation of AIT. In line with, Ifinedo (2008) refers to the term as the degree to which managers in an organization provide authority, direction, and resources during and after acquisitions of IT. Top management support monitors the entire implementation process and enables resource distribution and thus is considered as a prerequisite for AIT success in organizations (Wang & Chen, 2006). Management is required to show full commitment to the implementation of the IT and make decisions relating to the system while delegating specific responsibilities regarding new technology implementation (Yap et al., 1992). In this regard, Chalu (2012) argued that a lack of management support would be a critical barrier to AIT usage. He further maintained that management support includes providing an enabling environment and facilities so that

AIT can operate efficiently and effectively and the allocation of all the necessary resources.

According to Choi (2007), allocating a high level of resources to support IT by top management increases technology usage within the organizations. However, Dong (2008) argued that top management support should go beyond resources provision in promoting IT because resources provision might only result in project completion. Thus, change management should also be conducted to gain user satisfaction to achieve the expected benefits of the technology. Salman and Amusa (2011) asserted that, for banks to meet the current IT challenges, the needs of their customers should be addressed to survive the dynamic business environment. They stressed the need of the bank management to provide an enabling environment to their managers and other personnel in such a way that AIT can be utilized effectively. Also, Agwu et al. (2014) argued that the lack of adequate in-house resources to support and maintain the new technology leads to failure. Therefore, the conclusion can be reached that top management support toward allocating the necessary resources can lead to AIT usage. In support of Agwu's, Chalu (2012) contended that top management support is critical to AIT success.

2.4.7 External Consultant Involvement

Many organizations lack the internal skills required to utilize AIT to its full potential, thus necessitating the use of experts with vast knowledge and experience to assist in configuring and maintaining the technology. External support has been recognized as

a key success factor for IT in an organization because external consultants may bring an outside perspective into the organization, which may significantly contribute to the effective usage of this technology (Thong et al., 1994). External consultant involvement can facilitate the carrying out of many tasks that organizations may be unable to handle (Ifinedo, 2008). The engagement of an external consultant assists organizations in providing different services such as mobilizing in-house resources and skills, offering specific and general knowledge of AIT, employee training, aligning organizational procedures with the technology modules and recommending a suitable solution to a user (Thong et al., 1996; Wang et al., 2008). Thus, external consultant involvement is an invaluable resource for AIT usage in organizations.

An external consultant is defined in this current study as a specialist who has technical knowledge and experience on how AIT operates and can assist users in understanding the technology to utilize its potential to the fullest. Past literature has indicated that, for organizations to have an effective AIT usage, a need exists to have the support of external consultant in the form of extended technical support, quality training, system upgrades and adequate maintenance both during and after the implementation of the technology (Dezdar & Ainin, 2010). Likewise, Bradshaw, Cragg, and Pulakanam (2013) argued that many organizations lack the skills and the capabilities required to use AIT technology. Therefore, they suggested the use of an external consultant so as to add value and enhance user competency in organizations. Based on this argument, the observation can be made that external consultant involvement is an important resource for organizations that aim to determine and evaluate AIT usage.

Accounting information technology is an important stimulus for organizational growth and sustainability (Radu, Bordeianu, & Paraschivescu, 2012), but the quality of this technology often depends on the extent of IT support provided by an external consultant (Mamic & Oluic, 2013). Bhatti (2005) asserted that, due to the complexity of IT, it has become necessary for organizations to employ the service of an external consultant (who has the knowledge of the software and how it operates) at every stage of the technology implementation. Although engaging the service of an external consultant is a long and complex process that is fraught with risk at each stage, the lack of external consultant involvement would negatively affect the system quality (Al-Ahmad & Al-Oqaili, 2013). However, Massey (2000) identified the rapid expansion of the consulting industry and the expansion of knowledge in terms of consulting practice and best-practice management as the two main challenges facing managers and consultants.

Massey (2000) further stated that for organizations to achieve successful outsourcing the following criteria were recommended: 1) identify the goals and needs, 2) initiate a request for information, 3) submit a request for proposal, 4) select a vendor, and 5) sign a contract. Without external support, only a few organizations can successfully implement AIT. Thus, external consultant support is recognized as a success factor for AIT usage in organizations. In their study Yap et al. (1992), identified three skill sets of skills that an external consultant possesses leading to AIT usage. These sets of skills include: external consultant experience, external capability, and external effectiveness. Consultant effectiveness in a performing analysis of an organization's

requirements, consultant effectiveness in managing the implementation of the technology and consultant effectiveness in recommending the proper solution are some ways by which the performance of external consultant can be evaluated (Thong et al., 1994).

The use of external consultant before and after the implementation of AIT brings an external point of view to organizations (Spacek, 2000), which can lead to getting things done correctly for the first time (Slater, 1999). Ifinedo (2008) indicated that external consultant involvement is critical to the AIT success because it provides varieties of services such as information requirement analysis and offering both general and specific knowledge of the AIT (Ifinedo, 2011). Conversely, the absence of an external consultant with the required skills and knowledge to support AIT before and after implementation might lead to greater chances for failure of the technology adoption (Metrejean & Stocks, 2011). Based on above discussions, the conclusion can be made that external consultant involvement might lead to effective AIT usage in an organization.

2.5 Theoretical Framework

A theoretical framework is formulated based on the literature discussed and the practical problem highlighted in the areas in which current study was conducted. The theoretical framework is a logical design and elaborated connection of the associations between the concept and the variables that are found to be relevant to the current problem under investigation (Awais & Sundram, 2015). Awais and Sundram (2015)

state that the theoretical framework enables a researcher to answer questions on how and why certain variables influence another variable based on theory and a model. A framework contributes to research in two ways: 1) the identification of variables of interest and 2) the clarification of the relationships that exist between and among the variables (McGaghie, Bordage, & Shea, 2001). Thus, a framework shows the graphical representation of relationships amongst the variables of a study.

Consistent with this guideline, the diagram in Figure 2.1 represent the framework of the study. Although many studies on AIT usage exist to date, unfortunately, these studies are fragmented and inconsistent in their findings. Also, most of these studies pertained to general IS/IT rather than to specific IT. Hence, in line with the literature and theoretical evidence, which indicated the likelihood of a relationship between the determinants and AIT usage, the current study developed a theoretical framework to investigate the relationship as shown in Figure 2.1 using a quantitative approach.

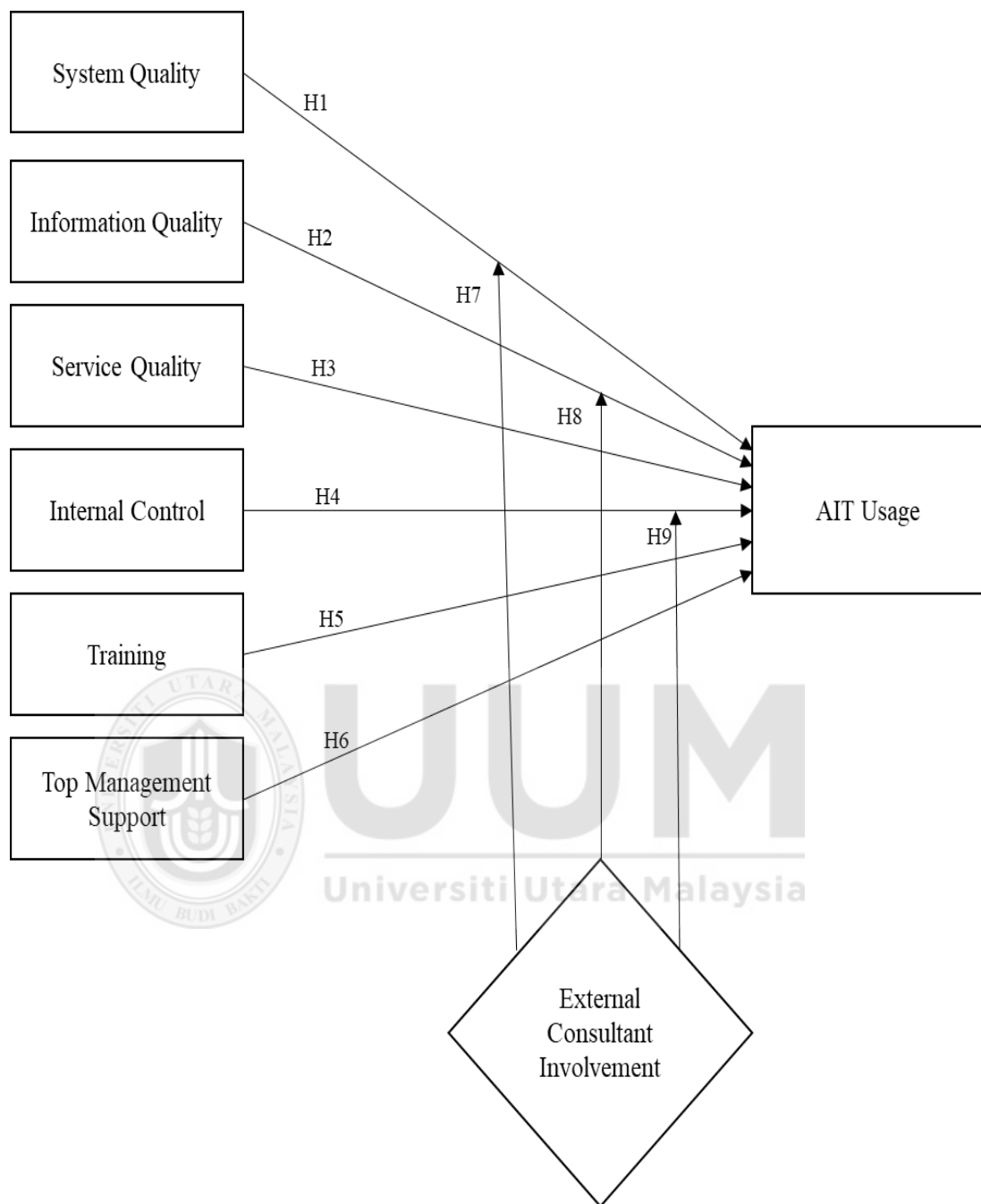


Figure 2.1. Theoretical Framework.

The current study adopted the DeLone and McLean Model of IS success, which is one of the most established models for AIT usage and has been used in many kinds of literature, to further investigate the determinants of AIT usage. Also, RBV theory was

utilized in this study to avoid the issues of the contextual weakness of the DeLone and McLean Model as past literature has claimed (Ifinedo, 2006; Ballantine & Powell, 1998). Other theories, discussed include; The Unified Theory of Acceptance and Use of Technology, the Theory of Reasoned Action, and the Task-Technology fit.

2.6 Summary

This chapter first discussed IT usage in the Nigerian banking sector. This was followed by a discussion of AIT issues, the definition of AIT, and the general importance of AIT to organizations and banks in particular. Next was a discussion on AIT-related issues, a definition of AIT and the importance of AIT to organizations in general and to banks. In addition, the chapter provides a detailed review of past literature on the dependent variable and independent variables of the study, which provides an avenue for this study to develop a theoretical framework. The following chapter discusses the underpinning theories and formulates the relevant hypotheses of the study.

CHAPTER THREE

HYPOTHESES DEVELOPMENT

3.1 Introduction

This chapter describes theories in AIT research and the hypotheses development of the determinants of the study. The variables of this study are derived from the extant literature based on the phenomenon under investigation. This study comprises seven variables, and relevant theories were used to highlight the relationship among them. Therefore, the subheadings below discuss the underpinning theories and the hypotheses for the study.

3.2 Theories of Accounting Information Technology

Organizations are investing vast sums of money on AIT to derive benefits from these systems. Because large investments are made in AIT, evaluating the success of IT has become an issue of utmost importance to academics, practitioners and managers. They want to determine the impact of these technologies on organizational performance. As such, different theories and/or models have been developed to measure the success of these technologies. This section discusses some key theories that are originated from the IT discipline and other related areas.

Based on extant literature review, the observation can be made that some theories that related to IT and individual users, while other theories directly focus on IT and organizations. The theories that discuss IT and individuals include the Theory of

Reasoned Action, the UTAUT, and the Task-Technology fit. For the AIT and organizations stream, the dominant theories are DeLone and McLean's IS success model and resources-based view theory. The next subsections discuss both streams of theories.

3.2.1 The Theory of Reasoned Action

The Theory of Reasoned Action can be traced to the discipline of sociology, specifically based on social psychology. This theory was first developed in 1975 by Fishbein and Ajzen and subsequently revised in 1980. The theory was developed to understand behaviours that an individual voluntarily engages in. The theory assumes that the performance of such individual is contingent on the individual's motivation to perform. The Theory of Reasoned Action comprises two exogenous constructs related to the intention to perform a behaviour: 1) attitude towards a behaviour and 2) subjective norms.

Attitude towards a behaviour is defined as a person's evaluation of performing the behaviour, which comprises two classifications, namely, affective and instrumental attitudes (Mansted, 2004; Ajzen, 2006). On the other hand, subjective norms describe individual perceptions of the expectations of the people who are important to them as to whether they should or should not perform a certain behaviour (Mansted, 2004; Ajzen, 2006). To evaluate such assumptions both descriptive and injunctive qualities are important. Similar to attitude towards behaviour, subjective norms are also impacted by individual beliefs referred to as normative beliefs. According to Mansted

(2004), normative beliefs comprise an individual's beliefs that are important by which people would expect him/her to act in a certain manner that matches their expectations.

Many studies in the field of IT and other related IS areas have adopted the Theory of Reasoned Action to explain the determinants of technology usage behaviour by investigating the relationship between beliefs and normative beliefs with attitude and intentions of individuals (Taylor & Todd, 1995). Based on this theory, the immediate determinant of behaviour is the intention to perform the behaviour. In turn, the individual's intention to perform a behaviour is assessed by a person's subjective norms and attitudes toward a behaviour. Despite the wide applications of this theory and its ability to predict and explain human behavioural intention, the theory lacks significant control or resources needed to carry out the targeted behaviour freely (Liska, 1984). Even with the application of this theory in the field of IT, none of the core constructs are used in the current study. In addition, the theory seems to place an emphasis on an individual user rather than on an organization.

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

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh, Morris, Davis, and Davis (2003) to provide a comprehensive theoretical basis that facilitates studies on IS adoption and diffusion. Venkatesh et al. reviewed, combined and synthesized eight dominant theories and models of technology acceptance and usage to have an in-depth understanding of individual usage behaviour. These theories include: the Theory of Reasoned Action, the Technology Acceptance Model, the Theory of Planned Behaviour, the Motivational Model, the

Innovation Diffusion Theory, the Social Cognitive Theory, the Theory of PC utilization, and a combination of Technology Adoption Theory and the Theory of Planned Behaviour. The UTAUT assumes that performance expectancy, effort expectancy, social influence, and facilitating conditions are the core and direct determinants of IS/IT behavioural intention (Venkatesh et al., 2003). The theory further postulates that the effect of four core determinants are moderated by age, gender, experience, and voluntariness of use.

Since the inception of UTAUT model, a large number studies of innovation adoption and the diffusion of technology within the context of IT and other related field have successfully utilized the theory (Chang, Hwang, Hung, & Li, 2007; Chiu & Wang, 2008; Wang & Shih 2009; Abu-Shanab & Pearson, 2009; Chiu, Huang, & Yen, 2010; Li, 2010). The motivation to propose and validate UTAUT was based on the argument that many constructs of the existing theories and model are similar in nature. Thus, a need existed to map and combined them into a single model (Venkatesh et al., 2003). Furthermore, Ventatesh James, Thong, and Xu (2012) added three constructs to the original UTAUT model, namely, hedonic motivation, habit, and price value. This new model that integrates UTAUT model to the IS adoption behaviour is known as UTAUT2.

Despite the application of the UTAUT model in different contexts, Bagozzi (2007) argued that this model is nothing more than a patchwork of many unintegrated and uncoordinated abridgements. Bagozzi (2007) further identified some key issues regarding UTAUT. These include an absence of a sound theory and procedure for

understanding the factors of PU and PEU as well as a basis for decision making. The model seem to ignore group, social, and cultural characteristics of decision making and trusts naive and over-simplified notions of affect. Additionally, the model solely focuses on a deterministic framework lacking consideration of self-regulation processes. The theory components as Ventakesh et al. (2003; 2012) developed have been utilized to provide a basis for a user evaluation instrument at the individual assessment of IS rather than on an organizational assessment of IT outcomes. This makes the theory inappropriate for current study, which is aimed organizational evaluation of AIT usage.

3.2.3 The Task-Technology Fit Theory (TTF)

Goodhue and Thompson (1995) developed a comprehensive technology to effectiveness model comprising IT characteristics, tasks, and the individual user as an explanatory construct for technology usage and individual performance. The task-technology fit (TTF) is described as the extent to which technology helps an individual in carrying out daily routine tasks (Goodhue & Thompson, 1995). The TTF provides a better way of evaluating how individuals process information. In essence, it explains why people process information and how technology facilitates job tasks (Ioimo, 2000). The proposed conceptual model of task-technology fit provides guidelines for the design of effective IS.

Goodhue and Thompson (1995) identified eight dimensions of fit as perceived by the IS users including measures for the quality and accessibility of information, system reliability, ease of system use, and the relationship between the IT and system users.

The motivation of the TTF is to predict whether the selected IS application is appropriate for the tasks to be achieved. This might lead to better performance compared to IS that is poorly suited to the portfolio of tasks. The performance impact of an individual can be assessed by looking at how well the work is performed or how much value has been added as a result of the system usage. Significantly, a higher level of individual performance implies improved efficiency and effectiveness thus leading to higher quality of output (Goodhue & Thompson, 1995). Contrarily, poor performance can suggest ineffectiveness.

The level of TTF is specifically based on the IS evaluations carried out by individual users of a certain technology. These evaluations determine the user beliefs of the characteristics of a certain technology; this is normally given on a scale of either positive or negative ratings. A technology that enhances individual performance is rated positively while a negative rating indicates a dampening of an individual user's performance (Chandler, 1995). In support of this view, Benslimane, Plaisent, and Bernard (2003) stated that a better fit between task requirements and IS functionalities increases the chances of a higher level of usage of IT by the user and thus results in higher user performance. Specifically, Goodhue and Thompson (1995) described their model as follows:

MIS success ultimately corresponds to what DeLone and McLean label individual impact or organizational impact. For our purposes, the paper focuses on individual performance impact as the dependent variable of interest (p. 213).

While Goodhue and Thompson (1995) focused on individuals' usage of general IS, this implies that the theory might not be appropriate for a study that is focused on organizational impact as dependent variable. Based on the preceding discussion, the next section discusses the DeLone and McLean IS success model.

3.2.4 The DeLone and McLean IS Success Model

Since the development of DeLone and McLean's model in 1992, the model has gained recognition, and many researchers in the IS area have adopted it. This model was primarily built from the work of Shannon and Weaver (1949) who suggested that the success of information could be measured at three levels, which are the scientific, technical, and usage levels. Subsequently, Mason (1978) improved on these levels and emphasized the antecedents to outcomes. Using these two theories and based on reviews of 180 IS usage studies, DeLone and McLean (1992) concluded that IS success/effectiveness can be grouped into six interdependent processes or dimensions: 1) system quality, 2) information quality, 3) IS use, 4) user satisfaction, 5) individual impact and 6) organizational impact as shown in Figure 3.2. However, the authors did not validate this model, and hence they recommend the empirical testing and validating of the model. They describe their model as follows:

System quality and information quality singularly and jointly affect both Use and User satisfaction. Additionally, the amount of Use can affect the degree of User satisfaction positively or negatively – as well as the reverse being true. Use and User satisfaction are direct antecedents of Individual impact (DeLone & McLean, 1992, pp. 83-87).

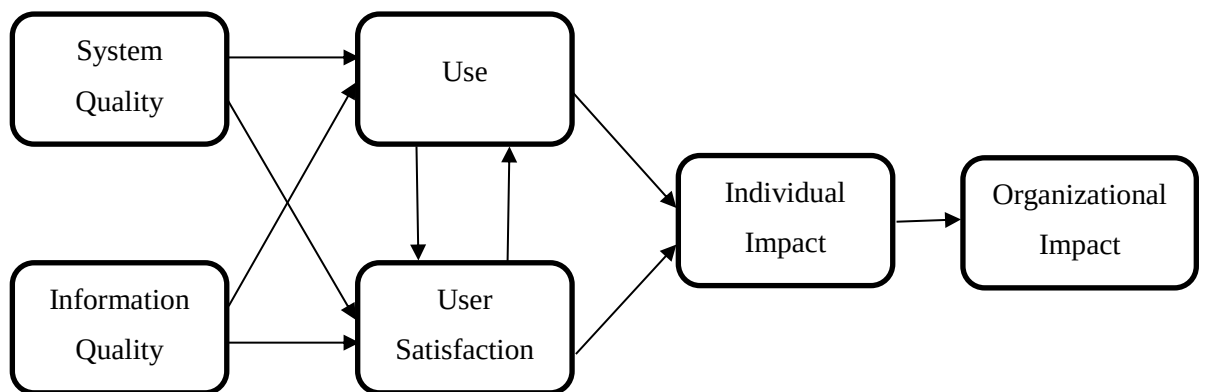


Figure 3.2. The DeLone and McLean Model (1992).

Despite the wide adoption of this model in the literature, some researchers have criticized the model. Some consider the framework as a taxonomy because it has not been empirically tested. Seddon (1997) claimed that the DeLone and McLean model is confusing because it combines causal and process explanations of IS effectiveness. Therefore, Seddon (1997) introduced a causal model for the six groups. Information system use was replaced with perceived usefulness because the author also claimed it was not a measure of effectiveness. Similarly, Ballantine et al. (1996) criticized the causal relationship shown among constructs in the DeLone and McLean Model, they further argued that effective IS should not begin with dimensions such as system quality and information quality, but rather it should begin from the organizational level passing on to the individual level. Rai, Lang, and Welker (2002) integrated both the DeLone and McLean and the Seddon frameworks, and they concluded that the two frameworks show a reasonable fit in their study. Motivated by the SERVQUAL instrument originally used in the marketing area, Pitt, Watson, and Kavan (1995)

modified the DeLone and McLean Model by introducing a new dimension labelled service quality. They claimed that DeLone and McLean IS usage measures focus more on product and ignore the service dimension.

In 2003, DeLone and McLean refined their earlier model in responses to the criticisms; they agreed with Seddon's (1997) idea that the mixing of variance and process explanations of IS success in a single model might be confusing. But, they argued that Seddon's re-specification of their 1992 model into two partial variance models unduly complicated the IS success model, thus defeating the intent of the original model. They extended their model by adding new dimensions of service quality and intention to use, and the individual and organizational impact dimensions were combined to another new dimension labelled the net benefit. The unified model is described as follows: the information quality, system quality, and service quality singularly and mutually affect intention to use and user satisfaction. Furthermore, the intention to use affects net benefit. Figure 3.3 shows the updated framework of DeLone and McLean model.

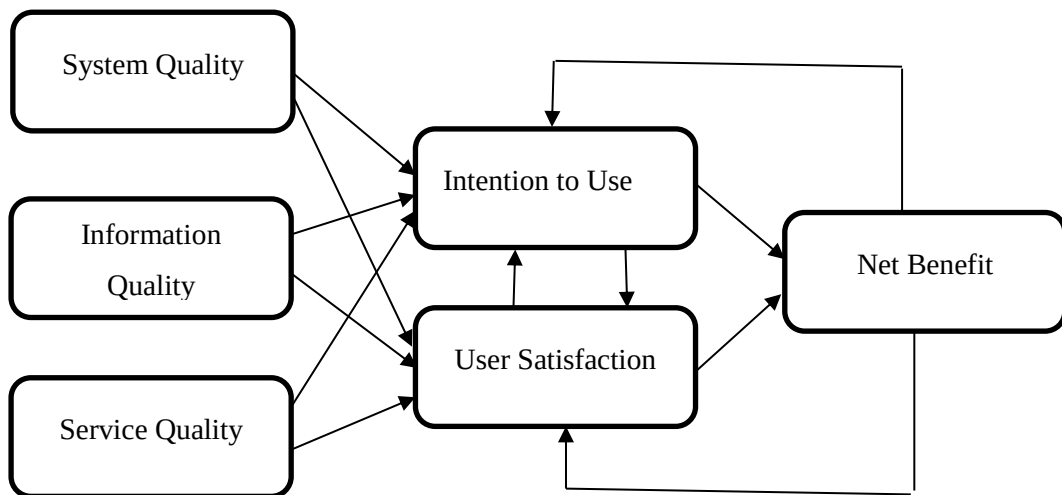


Figure 3.3. Updated DeLone and McLean Model 2003.

Based on the six factors or categories of DeLone and McLean IS success measures many studies have attempted to evaluate the model at different levels. Some researchers desired to focus on the characteristics of the IS/IT itself, i.e., system quality which represents the technical level of the model. At the semantic level, researchers have focused on the products of the system, which included information quality. From the influence level, interest seems to focus on evaluating the information product interaction with the recipient through measuring use and user satisfaction. Moreover, some researchers have chosen the effect that the system has on the decision making of management by evaluating individual impact. Another stream of researchers is interested in system outcomes on organizational performance as organizational impacts.

Ballantine and Powell (1998) suggested that DeLone and McLean's model makes significant contributions to the understanding of IS/IT usage by integrating previous research and providing measures for classifying IS/IT usage. They further assert that

the model is considered the most appropriate for empirical and theoretical research because it has met the general acceptance of IS/IT community. However, the literature claims that DeLone and McLean's model may be insufficiently complete because it ignores contextual influences (Ifinedo 2006; Ballantine & Powell, 1998).

DeLone and McLean also indicated that contextual factors need to be considered in IS studies. They suggested that further development, criticism, and the validation of their model is needed. Therefore, the framework of this study considers other contextual factors that can influence AIT usage, and these factors can be traced to Resource-based View (RBV) theory. In support of this, Ismail (2009) claimed that theories applied in AIT studies are drawn from the multidisciplinary areas such as social and management sciences, marketing and economic as well as computer sciences.

3.2.5 The Resource-Based View

One of the contemporary and dominant approaches in the analysis of sustained firm competitive advantage is the Resource-based View Theory. The theory can be traced to industrial economics and has been growing in popularity in the field of marketing, strategy and IT literature. The RBV contends that firm resources derive from a bundle of both tangible and intangible assets that are unique, valuable and sustainable (Barney, 1991). These approaches adopted two basic assumptions in assessing sources of competitive advantages. The first assumption of this theory is that a firm within an industry may be heterogeneous with regard to the bundle of resources that they control. Second, the theory assumes that resources heterogeneity might persist over time

because the resources used to implement firms' strategies are imperfectly imitable across firms (Barney, 1991). In this regard, Mata, Fuerst, and Barney (1995) stated that the concept of firm resources and capabilities are widely defined and include the ability of a firm to adopt, implement and use valuable IS applications.

Resources are organizational assets that are available and useful in detecting and reacting to opportunities or threats within the market environments (Wade, 2002). An asset means any physical, organizational or human attribute that serves as input or output of a process such as AIT. Intangible assets, for example, might include training quality and strong vendor relationship (external consultant) and patent rights. Nonetheless, the literature has claimed that tangible assets are the simplest resources that can easily be imitated by competitors and thus are regarded as the most fragile sources of a sustain competitive advantage (Barney, 1991). On the other hand, capabilities are regarded as a unique type of intangible asset of an organization. These refer to repeatable forms of action in use such as the quality of an internal control mechanism adapted to safeguard a firm's assets, coordination, interaction and transformation of AIT (assets) to produce and offer product or services to the market, and managerial ability (Wade, 2002). Also, capabilities are unique know-how of the organization that leverages the enabling potential of other resources in the organization (Acklesh et al., 2013). Therefore, for the organization to gain a sustainable competitive advantage, they must combine their capabilities with other resources.

Internal control quality is an internal organizational capability that has the potential of increasing the competitive advantage and the sustainability of banks. Quality internal control improves security measures and safeguards the assets of the banks and assists bank managers in shaping the overall attitudes and culture of their employees toward achieving the goals and objectives of the organization (Stefanol, 2012). In contrast, weak or bad internal control often leads to negative consequences such as fraud, embezzlement, and the collapse of banks (Abilola, 2014).

Similarly, Barney (1991) stated that social complexity is a multifarious relationship that a firm could possess both internally and externally that is very difficult for to imitate. For instance, banks that can build their employees knowledge and skills quickly and apply the knowledge in their daily routines may lead AIT usage, thus providing a competitive advantage over their competitors. In support of this, Powel and Det-Micallef (1997) applied RBV theory to examine the role of IS as a tool for gaining competitive advantages. The study categorized employees' IT training under business resources IS. The findings indicated that quality IT training has significant and positive impacts on the firm.

Top management support is another internal organizational capability or organizational factor that leads to AIT usage, and thus can create a sustainable competitive advantage as a result of financial or support. Top management support is needed both prior and after the implementation of the technology (Cho, 2007). Therefore, such support is perceived to have a positive impact on IT resources

(Anggadini, 2015). Likewise, in an attempt to justify the application of RBV theory in IT research, Wade and Hulland (2004) argued that, when top management support is lacking, the effect of IT resources on competitive advantage would be little, even when a huge investment is made during the design or acquisition process of such a system. By contrast, strong top management support will facilitate AIT usage.

Similarly, Mata et al. (1995) argued that the use of a quality external consultant would enable a firm to manage the risks associated with an investment in AIT. Banks can acquire technical support by hiring a high-quality consultant, then use their employee's training skills to help the external consultant to fit into the organizational culture, understand the policies, and procedures, as well as know how to relates to other functional areas of the banks. These relationships may be heterogeneously distributed among firms, thus creating a sustainable competitive advantage. Nevo, Wade, and Cook (2007) argued that the involvement of an external consultant with vast IT knowledge and experience can also be valuable and provide unique resources that lead to positive impacts on the AIT of an organization.

Although AIT has been a source that creates a sustained competitive advantage for firm, little empirical and theoretical research supports this argument (Barney, 1991). Nonetheless, there is no doubt that the use of AIT adds values to the firms either by increasing firm revenue or reducing its operating costs through differentiating their product or services. Therefore, is is a valuable resource for organizations (Mata et al., 1995); in addition, IT resources have the potential to support both short-term and long-

term advantages (Wade & Hulland, 2004). The resource-based views emphasize the capabilities that are unique, appropriate, and valuable. These qualities will enable organizations to gain a competitive advantage when they are non-substitutable, inimitable and immobile.

In line with this assumption, Jeffers, Muhanna, and Nault (2008) stated that, to successfully determine the competitive implication of IT, non-IT determinants should be included, especially those resources that have the potential of improving business processes of organizations. An argument can be made that, to create business values for banks through it AIT, they should mix their internal capabilities (i.e., quality of internal control, training, top management support, and external consultant involvement) with other resources to manage their operational activities to achieve a sustain competitive advantage for the banks, thus leading to AIT usage.

It is obvious that RBV has been tested across a number IS research domains with credible research findings (Powel & Det-Micallef, 1997; Wade & Hulland, 2004; Zhu & Kraemer, 2005; Nevo et al., 2007; Ismail, 2009; Zoran, Otilija, & Sofija, 2010; Tazik & Mohammed, 2014). What has been found is that the more compatible the AIT characteristics (system quality, information quality, and service quality) are with a bank's internal resources such as internal control quality, training and top management support and the extent of external consultant involvement, the more likely the AIT to be effective. Therefore, current research contributes to AIT usage research by integrating DeLone and McLean's model and RBV theory. This was achieved through

consolidating previous research into a single framework. Thus, the conclusion can be made that internal control quality, training, top management support, and external consultant involvement are among the intangible assets that are heterogeneously distributed among firms and thus might lead to AIT usage as well as the sustained competitive advantage of the banks.

3.3 Hypotheses Development

Having presented the theoretical framework on the determinants of AIT usage in Figure 2.1, testing the model using real life data to examine its validity and strength of the relationship of the proposed model is important. The hypotheses are developed based on the literature review as presented in Chapter Two of this study. The variables used for this study are system quality, information quality, service quality, internal control quality, training, top management support, and external consultant involvement.

3.3.1 Accounting Information Technology Usage

Accounting information technology is concerned with the use of hardware and software applications designed to implement the collection of data, measurement, and communication of information for planning and controlling the operational activities of the banks. This construct has been widely studied in the academic literature as earlier highlighted, and researchers have taken different approaches in understanding it, thus making it difficult to evaluate (Chalu, 2012). Also, previous studies have emphasized the importance of the system quality, information quality, service quality,

internal control quality, and training, as well as top management support and external consultant involvement as key factors that will enable organizations to achieve their desired benefits of AIT.

3.3.2 System Quality and AIT Usage

System quality is one of the important constructs in the DeLone and McLean model (1999; 2003). It refers to the degree of technical efficiency of the system, in terms of user interface consistency, ease of use, programming errors and the maintainability of the system. It is considered as an important factor in determining AIT usage in an organization. According to DeLone and McLean (1999; 2003), a well-designed and implemented system leads to an effective system. Although system quality was not theorized as a direct determinant of AIT in the DeLone and McLean model, many studies have attempted to test the direct relationship between the constructs. However, their findings remain inconclusive.

DeLone and McLean's IS model was integrated by adding human-related factors, to investigate the influence of these factors on AIT usage and decision making in organizations. The results revealed a significant relationship between system quality and IS usage in an organization (Quintero, Pedroche, & Ramos, 2009). In examining the post implementation of IT usage in organizations, Yan et al. (2010) found that system quality has a significant influence on the post implementation of IT usage in an organization. Similarly, Xu, Benbasat, and Cenfetelli (2013) examined the impact of system quality on the adoption of IS, using the 3Q model, which is an integrated

model of technology usage by Wixom and Todd (2005). It was found that system quality has a significant influence on IT usage. Also, Negash et al. (2003) found a positive relationship between system quality and Web-based customer support systems. However, the focus of the authors was on web-based IS within the organization so a need exists to explore the constructs in different contexts and settings.

Likewise, determining the usage of e-learning systems in Taiwan universities, Ming-Lang, Ru-Jen, and Hui-Ping (2011) found that system quality has a significant effect on IT effectiveness. In a closely related study, Hien et al. (2014) empirically found that system quality has a significant relationship with IS usage at Lac Hong University. Similarly, Hyung and Jae (2010) evaluated the end user satisfaction of Campus-Wide Information System (CWIS) usage in a Korean university. The results indicated that system quality significantly influences user satisfaction. Although the same results were documented in similar contextual studies, both studies were conducted in the educational sector rather than in the banking sector. Unlike Ming-Lang et al. (2011), and Hyung and Jae (2010) who focused on universities, Chang et al. (2012) designed a framework that determines IS user needs in medical institutions. The results indicated that system quality has a positive influence on IT performance. In contrast, Daoud and Triki (2013) and Gorla et al. (2010) found no significant relationship between system quality and IT usage.

To further substantiate the inconsistency of results, Sajady et al. (2008) evaluated the usage of AIT in Tehran Stock Exchange; the results indicated that the system quality does not influence AIT. On the other hand, analyzing 386 valid responses from Jordanians banks Shatat et al.'s (2013) study found a positive relationship between systems quality and AIT usage. On the same note, Balasubramanian et al. (2014) found a significant relationship between system quality and bank IS usage. Also, Ching-Sheng, Su-Yueh, and Yi-Ting (2012) found that system quality has a positive influence on IT success.

Based on the above discussion, the conclusion can be reached that system quality is an important factor in determining AIT usage in organizations, specifically the banking sector. However, most studies focused on other organizations in general and not on banks. Similarly, the researcher did not find any study conducted in Nigeria that investigated the influence of system quality on AIT usage. Therefore, this current study tests the construct in the Nigerian banking sector, and the system quality construct was conceptualized as a second-order formative and measured with security, ease of use, and efficiency, which are all adapted from Chang et al. (2012). Furthermore, considering the relevance of DeLone and McLean model in IS/IT literature, this study deems it is necessary to use the model as the underpinning theory. Thus, the current study posits the following hypothesis:

H1: There is a significant and positive relationship between system quality and AIT usage.

3.3.3 Information Quality and AIT Usage

Information quality has been widely used in IS literature and is said to be an important factor for IT usage in organizations. Information quality means the ability of the system to provide timely, accurate, relevant, and complete information to the user for effective decision making. It measures the quality of output produced by IT (DeLone & McLean, 1999; 2003). Quality information reduces the number of errors produced during transaction processing and, thus, enables banks to produce more accurate and usable information for effective decision making (Imeokparia, 2013). Different studies have been conducted to examine the relationship between information quality and IT usage. However, these studies have provided mixed and inconclusive results.

Recently, Anggadini (2015) found that information quality has a significant influence on AIT usage in Indonesian organizations. On the same note, Alzoubi (2011) investigated AIT usage in Jordan. A survey instrument was distributed to financial managers and accountants of the sampled companies under study. The results showed that information quality has significant influence on AIT. Conversely, several studies have found an insignificant relationship between information quality and AIT in organizations (Aryani & Krismiaji, 2013; Al-Hiyari et al., 2013; Daoud & Triki, 2013).

On the other hand, evaluating the key determinants of IS usage in Lac Hong University, Hien et al. (2014) found that information reliability, which is one of the dimensions of information quality, has a strong correlation with IT usage. Negash et

al. (2003) conducted a further exploration of IS in universities collecting survey responses of 726 from 22 different universities to examine IT usage. The results indicated a positive relationship between information quality and IT usage. Likewise, Nelson et al. (2005) investigated the influence of information quality on IS usage in a data warehouse by considering five dimensions as the determinants of information quality. The results from the study revealed a significant relationship between completeness, accuracy, and format with information quality, which leads to the effective usage of IS. Information quality dimensions of reliability, relevance, scope and timeliness were found to have significant and positive relationship with AIT in organizations (Moolanazir & Abdolkarimi, 2012; Mamic & Oluic, 2013; Harash, Al-Timimi, & Rada, 2014).

Al-Kasswina (2012) found a significant relationship between information quality and AIT while examining e-government accounting systems in Jordan. Also, Nicolaou (2000) indicated that information quality has a significant influence on AIT usage in a study of 600 organizations using EDI systems in various organizations in the United States.

Unlike the above studies that considered either educational institutions or organizations in general, few streams of studies have focused on banks. For example, Shatat et al. (2013) tried to determine IS success factors in Jordan banks. They found a positive relationship between information quality and BI system usage in banks. Also, Amiri and Salari (2012) indicated a significant relationship between information

quality produced and AIT in organizations in India. In a closely related study, Ikem, Chidi, and Titus (2014) and Ige and Odetayo (2014) found a significant and positive relationship between information quality and bank AIT usage.

Considering the above findings, information quality remains an important variable in AIT study because it can facilitate decision making within an organization and enables managers to make timely and accurate decisions. Furthermore, a need exists for more studies on information quality and AIT usage because findings from previous studies remain mixed. Also, most of the literature focuses on organizations in general, not on banks. To this researcher's knowledge, only four studies conducted in Nigeria have investigated the influence of information quality on AIT. Therefore, this study examines the relationship between information quality and AIT usage in the Nigerian banking sector. The construct was operationalized as second-order formative and has the three dimensions of timeliness, accuracy, and completeness. Hence, the following hypothesis is posited:

H2: There is a significant and positive relationship between information quality and AIT usage.

3.3.4 Service Quality and AIT Usage

Service quality is another construct of the DeLone and McLean model (2003). Service quality refers to the degree of responsiveness, assurance, and empathy of the bank IT units that support the efficient operation of the systems and, thus, result in AIT usage of a bank. Service quality is an important IS dimension in an e-commerce environment

and for an organization that is trying to find areas of needed service improvement and IT usage measures (Jiang, Klein, & Crampton, 2000). Also, Arshah, Desa, and Hussin (2009) asserted that effective service quality in AIT environment enhances the integration of related technology across an organization, provides appropriate support needed by the end user and overall leads to increased organizational performance. In support of these, Chang et al. (2012) revealed that service quality has a positive influence on IS.

In Hong Kong, Gorla et al.'s (2010) study indicated that service quality is the most influential construct of IS success. The findings further revealed the positive and significant relationship between service quality and IS. Shatat et al. (2013) found that a significant relationship between service quality and BI technology usage in banks. A recent study by Lam et al. (2014) found a significant and positive relationship between service quality and IT usage.

In contrast to the above findings, Negash et al. (2003) found no significant relationship between service quality and IT usage. Thus, the study of the service quality construct has documented mixed findings over the years (Peter et al., 2013). In line with this, DeLone and McLean (2003) contended that service quality dimensions might have different weights depending on the context of analysis.

Nonetheless, the argument has been advanced that by having a highly-committed IT staff that provides the expected service quality through a good relationship with

system users (assurance) and understanding the user(s) service needs (empathy) and providing the prompt response in problem-solving (responsiveness), a user will be encouraged to efficiently and effectively utilize a system (Wang & Chen, 2006; Gorla et al., 2010).

Despite the importance of the service quality in AIT usage model, very few studies have tested the construct in the banking sector. Even though the construct has been studied extensively, the findings remain mixed and inconclusive. Also, no single study has investigated the construct in the Nigerian context. Therefore, this study tests the construct in Nigerian banking sector, which is measured with the three dimensions of responsiveness, empathy, and assurance. Therefore, this study hypothesized that:

H3: There is a significant and positive relationship between service quality and AIT usage.

3.3.5 Internal Control Quality and AIT Usage

Internal control quality is concerned with the mechanism adopted by the banks to safeguard and evaluate the accuracy and reliability of its accounting information that ensures operational efficiency of the banks. Abdelhak (2009) found that AIT is used as a tool for internal control and security in the banks. An effective AIT guarantee of security and control of data transfer both within and outside the bank enables the bank to maintain its competitive position by preventing data spying and piracy.

The literature has studied internal control in various contexts. For example, Hood and Yang (1998) examined the influence of IS in China Northern banks. The results indicated that banks have inadequate internal control measures. Furthermore, the study showed that, although the management of the banks had knowledge of the security threat, little effort was expended in reducing risk and losses associated with these threats.

Abdallah (2013) found that the use of IT has a positive impact on the internal controls of the Jordanian Income Tax and Sales department, which leads to increase in revenue generation. Abiola's (2014) study indicated that the use of IT has a significant improvement on the effectiveness of internal control of banks in Nigeria. Similarly, Al-Qudah (2011) revealed that AIT has a positive influence on the internal control and enables banks to generate more accurate and timely information for strategic and operational decision-making. Moreover, Sajady et al. (2008) concluded that successful implementation of AIT has positive effect on internal control systems, which leads to higher-quality reports and the facilitation of financial processes of the organizations.

Conversely, poor internal control might have adverse effects on AIT usage (Acklesh et al., 2013). To further substantiate the above findings, Alzoubi (2011) found that AIT has a significant and positive impact on the internal control effectiveness of banks. Also, Hayale and Abu-Khadra (2006) investigated the level of internal control quality of AIT in Jordan Banks. A survey instrument was administered to staff (head of the internal audit and IT unit) at bank headquarters. Data collected were analyzed

using simple percentage and Z-tests. The findings indicated that banks have strong internal controls, which reduces fraud and error.

On the other hand, Rajeshwaran and Gunawardana (2013) examined the effect of IT on the prevention and detection of security breaches. The results indicated that IT security controls were adequately implemented in all organizations. However, their findings further revealed weak internal control of IT. The authors cautioned that breaches in the internal control of companies can cause severe damage, and thus recommended that companies should implement both short- and long-term security measures to address the internal control weakness.

Based on the above literature reviewed, inadequate empirical literature exists regarding internal control quality and AIT usage. Additionally, few studies have provided theoretical assumptions on the significant influence of internal control quality and AIT usage in organizations (Abu-Musa, 2006; Ekwueme et al., 2012; Stefanoul, 2012; Acklesh et al., 2013; Toposh, 2014). Therefore, what is lacking in academic literature is the empirical evidence to support the assumptions of previous studies. Hence, the current study contributes to IT literature by examining the effect of internal control quality in a specific AIT context. Then, the current study posits that having good internal control can be critical to the effectiveness of the systems. Thus, examining the relationship between the constructs is necessary. Hence this study offers the following hypothesis:

H4: There is a significant and positive relationship between internal control quality and AIT usage.

3.3.6 Training and AIT Usage

Training quality has a considerable influence on employee performance that eventually affects the organization in general. Training quality refers to the extent to which employees' skills and knowledge acquisition programs assist them in understanding how important the technology is and how that technology relates to their work and other functional areas within the organization so as to contribute to AIT usage. Dehghanzade et al. (2011) claimed that adequate training courses provided to employees would significantly increase IT usage in organizations. Conversely, a lack of training employees regarding the usage of AIT will make employees find a means of manipulating the system, and these eventually may result in technological failure (Umble, Haft, & Umble, 2003).

Although a few studies have previously investigated training quality both in IT and AIS contexts, nevertheless these studies were inconclusive. For example, Argyropoulou (2011) found a significant relationship between training qualities and IT usage in organizations. Also, Zhang, Lee, Zhang, and Banerjee (2003) found that the training of employees will determine the success or failure of IT implementation in organizations. The finding of the study indicated that high-quality training has a significant influence on IT usage. Also, analyzing IT in Ghana, Karikari, Boateng, and Ocansey (2015) found a significant relationship between training qualities and IT

usage. In support of these findings from a different context, Rondeau, Ragu-Nathan, and Vonderembse (2010) examined the impact of end-user training quality in US manufacturing organizations. The study revealed a significant and positive relationship between training qualities and IT usage in organizations. Also, Cho's (2007) findings indicated that training has a positive relationship with IS usage.

Similarly, Apulu, Latham, and Moreton (2011) indicated a significant relationship between training quality and AIT in organizations. On the same note, Ali et al. (2015) evaluated the impact of IT in improving the training functions of Jordanian Islamic banks. The results revealed a positive correlation between training functions and AIT in banks.

Other studies have found no relationship. For example, Waal and Batenburg (2012) found no significant relationship between the end user training and IT usage and that such a relationship could only be achieved through a moderating effect. Likewise, Igbaria et al. (1997) study indicated no significant relationship between the internal training of employees with IT and that such a relationship was only found through external training. Also, Medina, Loera, Gonzalez, and Mora (2013) found an insignificant relationship between training and AIT usage.

Based on the preceding literature, studies have been conducted in different contexts, but the findings remain inconclusive. Furthermore, limited studies regarding AIT in

banks exist as most of the previous studies focused on organizations in general. Thus, this study offers the following hypothesis:

H5: There is a significant and positive relationship between training and AIT usage.

3.3.7 Top Management Support and AIT Usage

Top management support has been widely recognized as one of the key success factors for IT usage because top management provides the necessary resources, ensures proper integration and implementation of a project and gives appropriate guidance to the project manager (Schwalbe, 2010). Top management performs more than one function in running the business operations, they carry out most of the business decisions, and control organizational resources (Yap et al., 1992). Top management support is the extent to which bank managers provide funds, guidance and other resources needed before and after the implementation of AIT.

This construct has been studied in both the IS and AIT contexts in different settings and their findings are inconsistent. For example, Ifinedo (2008) developed a contingency model to evaluate the influence of top management support, external expertise and business vision on the success of IS in Finland and Estonia. The survey instruments of the study were administered to senior and unit managers in both countries, and a total of 62 valid responses were analyzed using PLS. The results indicated a moderate relationship between top management supports and IS success. He suggested that support, authority and direction and commitment from top management is necessary for the success of IT in the organization.

Other have studied top management support as well. According to a survey conducted by Anggadini (2015), top management support has a significant influence on IT usage in organizations. Chalu (2012) documented a significant relationship between top management support and AIT usage. Similarly, Cho (2007) revealed that top management support has a positive influence on IS usage in an organization. Likewise, Ganesamurthy and Amilan (2012) evaluated the critical success factor of IS, based on the perspectives of employees in both private and public banks. A simple random sampling technique was adopted, and 356 valid responses were collected from 83 branches. The results revealed that top management support is the most important success factor for IT success in banks. Similarly, evidence from Haron et al. (2012) indicated a significant relationship between top management support and IT usage.

Unlike Ganessamurthy and Amilan (2012) who employed a simple random technique, Haque and Anwar (2012) investigated the influence of top management support on all branches of private, local and foreign banks in Pakistan, using proportionate random sampling techniques. The survey instruments were distributed to branch managers, heads of operations and key stakeholders of the banks. It was found that an increase in top management support with funding and providing all the necessary support had a positive influence on employees, which, in turn, had a positive effective on bank performance.

Other have found no significant relationship. For example, Thong et al. (1996) revealed no significant relationship between top management support and IT

effectiveness. Similarly, findings from Ein-Dor, Segev, Blumenthal, and Miller (1984) and Srivan and Kaiser (1987) indicated no relationship between a lack of management support and IS usage in organizations.

Therefore, based on the above review, most of the literature has concluded that top management support is a key factor for AIT usage. Top management support has been associated with greater AIT usage and the lack of which is considered as a barrier to effective usage. However, only limited studies have been conducted in the banking sector, and the researcher did not find a study conducted in Nigeria, which examines the relationship between top management support and AIT usage. Hence, this study investigates the influence of top management on AIT usage in the Nigerian banking sector. Thus, this study offers the following hypothesis:

H6: There is a significant and positive relationship between top management support and AIT usage.

3.3.8 External Consultant Involvement and AIT Usage

Previous studies on the relationship between the DeLone and McLean quality-related measures (system quality, information quality, and service quality) and IT usage have been inconsistent. Such an inconsistency in the research findings is an indication that certain variables may moderate the relationship. This argument is supported by Edward and Lambert (2007) who stated that a moderator might be introduced to strengthen the relationship between the independent and dependent variable. Earlier, Baron and Kenny (1986) also had stated that, when the relationship between the

independent and dependent variable is inconsistent or unexpectedly weak, a moderator might be used to stimulate such relationship.

Although previous researchers (Anggadini, 2015; Astuty, 2015; Bach et al. 2011; Chang et al. 2003; Daoud & Triki, 2013) had tested the moderating effect of different variables on the relationship between AIT and its determinants, empirical consideration has not yet been given to external consultant involvement as a moderator. An external consultant refers to a specialist who has technical knowledge and experience on how AIT operates and can assist users in understanding the technology to utilize its potentials to the fullest. Past literature has indicated that for organizations to achieve effective AIT usage, a need exists to have the support of an external consultant in the form of extended technical support, quality training, system upgrades and adequate maintenance during and after the implementation of the technology (Dezdar & Ainin, 2010). Nonetheless, evidence from previous studies has indicated that external consultant involvement has a significant effect on IT implementation success (Zhang et al. 2003). The authors concluded that organizations should ensure that they source a reliable, dependable and trustworthy consultant. To this end, Zhang et al. (2005) believed that a qualified consultant with adequate knowledge of AIT and organizational business processes, the involvement of consultant in the implementation process, and service response time of the consultant were the three dimensions of external support that can lead in AIT success.

Many scholars have studied the impact of an external consultant. Schniederjans and Yadav (2013) contended that external consultant involvement has a positive relationship with AIT usage in organizations. In addition, some researchers (Zhang et al., 2005; Yoon & Im, 2008; Ifinedo, 2011; Tsai et al., 2011; Alhakbani & Alnuem 2012; Galy & Saucedo, 2013; Madapusi & Ortiz, 2014) found that the technical competency of the AIT users increases as result of the support received by a consultant, which, in turn, has a significant effect on AIT usage. More than a decade ago, Thong, Yap, and Raman's (1993) findings indicated high-quality external expertise is critical to the IS usage in organizations. Conversely, a lack of engagement of an external consultant might result in the failure of AIT in an organization, thus, making it difficult to realize the expected benefit of their investment (Thong et al., 1996). In line with these findings, Sparthis (2006) believed that collaboration between the organization and an external consultant would lead to effective AIT usage.

Thus, the conclusion can be made that AIT usage depends on the extent of external consultant effectiveness. If the level of external consultant effectiveness is high, then the level of AIT usage is expected to be high and vice versa (Thong et al., 1996). It is clear that the involvement of external consultant may provide the necessary expertise to enable banks to reap the potential benefits of their investments. Thus, to achieve AIT usage, the support of an external consultant is required before and after the implementation process to provide all the required technical assistance to users. Thong et al. (1994) concluded that the level of AIT usage was higher in a firm with a high level of external support than those with a low level of external support. More

recently, Ifinedo (2011) empirically revealed that system quality and information quality were higher in organizations that engaged the services of a reliable, dependable, knowledgeable and cooperative external consultant.

Based on the above theoretical and empirical assumptions, an argument can be made that an interaction between DeLone and Maclean's (2003) quality-related factor and external consultant involvement may have a significant effect on AIT usage in the context of Nigerian banks. The argument is that the involvement of an external consultant can stimulate the effects of the relationship of the quality measures (system quality, information quality, and service quality). Because previous studies have documented mixed findings among the constructs, a resolution of the conflicting results can sometimes be made by testing a moderating effect (Baron & Kenny, 1986).

This current study distinguishes itself from others by hypothesizing the moderating effect of external consultant involvement on the relationship between AIT determinants (system quality, information quality, and service quality) and AIT usage in Nigerian banking sector. Viewed through this lens, the experience and capabilities of an external consultant play an important role in AIT usage in the banks. Based on these previous studies, the level of AIT usage would be higher in banks with a higher level of external support than those with a lower level of external support. Therefore, this study proposes the following hypotheses:

H7: External consultant involvement moderates the significant and positive relationship between system quality and AIT usage, such that the relationship will be

stronger for banks with a more effective external consultant than banks with a less effective external consultant.

H8: External consultant involvement moderates the significant and positive relationship between information quality and AIT usage, such that the relationship will be stronger for banks with a more effective external consultant than banks with a less effective external consultant.

H9: External consultant involvement moderates the significant and positive relationship between service quality and AIT usage, such that the relationship will be stronger for banks with a more effective external consultant than banks with a less effective external consultant.

3.4 Summary

This chapter presented the underpinning theories and theoretical framework supporting this study. The chapter further discussed the research hypotheses of the study that examine the influence of determinants factors on AIT usage in Nigerian banking sector. Table 3.1 shows the summary of the research hypotheses to be tested.

Table 3.1

Summary of Research Hypotheses

Direct Path Hypotheses	Moderating Hypotheses
There is a significant and positive relationship between system quality and AIT usage.	External consultant involvement moderates the significant positive relationship between system quality and AIT usage, such that the relationship will be stronger for banks with more effective external consultant than banks with less effective external consultant.
There is a significant and positive relationship between information quality and AIT usage.	External consultant involvement moderates the significant positive relationship between information quality and AIT usage, such that the relationship will be stronger for banks with more effective external consultant than banks with less effective external consultant.
There is a significant and positive relationship between service quality and AIT usage.	External consultant involvement moderates the significant positive relationship between service quality and AIT usage, such that the relationship will be stronger for banks with more effective external consultant than banks with less effective external consultant.
There is a significant and positive relationship between internal control quality and AIT usage.	
There is a significant and positive relationship between training and AIT usage.	
There is a significant and positive relationship between top management support and AIT usage.	

The following chapter discusses the research methods and analysis used to test the hypotheses of the study.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter begins with a discussion of the basic research approach in information system study. Furthermore, the chapter discusses the research design, population, the unit of analysis, and the sampling method that the study adopted. Then the measurement instruments and their sources are also discussed. Finally, the chapter discusses the questionnaire design, data collection procedure, and the analysis method used in the study.

4.2 Philosophical Approach to Information Technology Research

Understanding the philosophical principles in the research process, especially in the domain of social sciences, enable the researcher to understand the foundation of knowledge and how knowledge is developed. Mingers (2001) asserted that researchers must identify the philosophical approach of their research because social and behavioral sciences researchers are naturally burdened with values. One branch of philosophy is epistemology; epistemology is concerned with what constitutes knowledge, how knowledge can be acquired and the extent to which a certain entity is known (Bates & Jakin, 2007). Recently, Awais and Sundram (2015) described epistemology as the theory of human knowledge that is concerned with the source, structure, process, and validity of the knowledge.

Another branch of philosophy in research is ontology, which is derived from the Greek words “ontos” and “logos” meaning “being” and “knowledge or theory” respectively, Ontology is concerned with what units of knowledge exist, how each unit is related to one another within a group or a particular hierarchy and what distinctions or similarities can be said to exist within the units (Guriano, Oberle & Staab, 2008). Therefore, to consider the ontological status of anything is to ask if it is real or an illusory. A realist argues that natural and social reality exist regardless of whether a human being can gain access to this reality or not. Conversely, a subjectivist assumes that reality is a projection of a person’s cognitive structures that have no independent status.

Some debate has arisen about the relationship between the epistemological and ontological perspectives. According to Morgan and Smircich (1980), the differences between these two research paradigms cannot be harmonized. Conversely, Pather and Remedy (2004) asserted that integrating of the differences that exist between the objective and subjective realism was possible.

Researchers can follow any of the several distinct schools of thoughts in their research design including positivism, interpretivism, critical realism, and pragmatism. A positivist develops his/her research hypotheses from a theory about the subject under research, and, after that, the theory is verified through an empirical approach. The theories are either supported or not supported in accordance with facts observed in the

objective world. The main objective of a positivist is to test the theory to understand the object under study.

Interpretivism argues that reality is subjective and defining what a phenomenon is depends on the circumstances and the individual concerned. They assume that reality can only be access through social constructs like language, shared meaning, and instruments (Awais & Sundram, 2015). One key distinction between positivism and interpretivism lies in their approaches to knowledge. Research methods adopted by a positivist includes surveys, laboratories, and quasi-experiments.

Critical realism and pragmatism reflect a researcher's belief that social reality is historically constituted and is produced and reproduced by individual members of a society. These research paradigms combine the features of both positivism and interpretivism. Researchers adopting critical realism and pragmatism believe that this world is so complex that it cannot be understood using empirical realism. Therefore, they normally adopt mixed methods in their study combing both qualitative and quantitative approaches.

Considering the research framework of this study and the objectives that the research seeks to achieve, the positivist paradigm seems the most appropriate. This research approach allows a researcher to investigate the relationship between constructs and the influence of one construct on the other. In addition, Jankowicz (2005) claimed that the positivism approach enables a researcher to examine a given phenomenon using the

hypothetic-deductive method. Therefore, a quantitative approach is the most appropriate for this study because it uses the hypothetic-deductive method.

4.3 Research Design

Research design is described as a blueprint showing how a researcher plans to gather and analyze the data and to interpret the findings to provide solutions to the research problem under investigation (Sekaran & Bougie, 2013). In this regard, Agbonifoh and Yomere (1999) stated that the nature of design that is applicable to an investigation depends on the aim of the inquiry. When a study is conducted to predict a relationship between the exogenous and endogenous latent constructs, this is described as hypothesis testing (Sekaran & Bougie, 2009). Thus, a hypothesis-testing approach is employed to achieve the research objectives because of its suitability and relevance to the nature of inquiry.

There are several types of approaches in business research; there is a quantitative approach, otherwise known as deductive, and a qualitative approach, also known as inductive. The quantitative research approach expresses its results in the form of numerical data from precise measurement while the qualitative approach produces its results in the form of words (non-numeric) from observations, documents, and transcripts (Awais & Sundram, 2015). The third approach, called the mixed (triangulation) approach, is the combination of the two the quantitative and qualitative approaches.

Looking at the objectives of the study, this study adopts the quantitative approach to investigate the direct effect of system quality, information quality, service quality, internal control quality, training quality and top management support on AIT usage. Furthermore, this study examines the moderation effect of external consultant involvement on system quality, information quality and service quality on AIT usage. A quantitative approach was used because it gives the researcher the ability to collect a sufficient sample size and thus allows for the generalization of the research findings (Sekaran & Bougie, 2009). Moreover, much literature in AIT has adopted this approach in their studies as shown in the literature review section.

To answer the research questions of this study, the survey research method was used, which involves the collecting on primary data through the administration of questionnaires. Osuala (2005) concluded that a sample survey is the most appropriate method to the social scientist interesting in gathering primary data to test hypotheses for generalization purposes. Furthermore, a cross-sectional survey was employed in collecting the primary data because it is considered as the best and most efficient method for collecting data from the targeted respondents (Bryman & Bell, 2007).

4.4 Population of the Study

The population of this study is all the commercial banks that are listed on the NSE. The population of the study refers to the entire group of people or unit of interest that the researcher wants to investigate (Sekaran & Bougie, 2009). Currently, there are 21 licensed and registered commercial banks in Nigeria with more than 5,750 branches

across the country. These groups of banks was divided into three clusters: North, Central, and South. This study was restricted to one state in each region because all the commercial banks operating in Nigerian banking sector offer similar products and services to their customers. In addition, comparing the banks from the different regions of the country was not among the objectives of the current study. Therefore, the population of current study is relatively homogenous. Table 4.1 summarizes the list of money deposit banks in Nigeria and their number of branches.

Table 4.1

List of Banks, Branches, Sample Size Proportion

Name of Bank	No. of Branches	Sample size Proportion	Distribution of Samples within Nigeria		
			North Kano	Central Abuja	South Lagos
Access	300	30	1	5	24
Citi Bank	12	1	0	0	1
Diamond Bank	230	23	2	6	15
Ecobank	611	60	2	10	48
Enterprise	150	16	1	4	11
FBN	600	60	8	10	42
FCMB	313	30	3	9	18
Fidelity	220	22	1	4	17
GTB	190	19	3	5	11
Heritage	11	1	0	0	1
Keystone	200	20	1	3	6
Main street	220	22	4	3	15
Skye Bank	260	26	1	4	21
Stanbic IBTC	140	13	1	1	11
Standard Chartered	42	4	0	1	3
Sterling	286	28	3	1	24
UBA	750	74	10	32	32
Union	400	40	7	7	26
Unity	242	23	8	4	11
WEMA	110	10	0	2	8
Zenith	500	50	3	12	35
Total	5,787	571	58	123	390

Note: Source, developed for this study.

4.5 Sampling Technique

Obtaining data from all members of a population that a researcher is studying is not always feasible (Hair, Money, Samuel, & Page, 2007). More specially in a study that involves several hundred or even thousands of elements, it would be difficult to collect data from, test or examine every aspect of the population. Even if it were were possible, time, cost, and other numerus resources would constrain from doing so (Sekaran & Bougie, 2010). Therefore, a researcher uses a sample form the population under study.

To ensure objectivity in the sampling method, a probability sampling technique was used in the current study. As Henry (1990) observed, when probability sampling is carefully designed and carried out then the sample has greater credibility, validity, and reliability for the research. Furthermore, because the population under study is spread across a wide geographical area, collecting data from the area may be expensive (Trochim & Donnelly, 2008). Thus, a sample was selected to represent the whole population under investigation.

As Raj (1968) stated, to conclude findings of the research, a need exists to obtain a sample of the entire population. In this case, Cochran (2007) suggested that the appropriate size of a cluster from the population should be determined. To achieve a sufficiently representative study sample, the current study employed a multi-stage cluster sampling technique. This is necessary because the population of this study covers a wide geographical location, and the bank branches are spread across the three

regions in Nigeria. The multi-stage sampling procedure was chosen because cluster theory assumes that the mean of sample clusters are unbiased estimates of the total population mean and produce accurate representative data (Cooper & Schinder, 2008; Hair et al., 2007). The procedure for technique involves a sampling of the groups of elements known as a cluster (North, Central, and South); then the selection of a state from each region (North (Kano), Central (Abuja FCT), and South (Lagos). This is followed by the selection of elements of each bank in the respective region.

The selections are made based on the urbanization of the area, high population concentration and commercialization or industrialization of those regions, thereby making it possible for a high concentration of banks branches in those regions. Moreover, due to the differences in the number of bank branches, probability proportionate to size sampling was applied to ensure that the selection is a true representative of the total population. This increases the credibility and objectivity of sample size selection, as indicated in Table 4.1.

As a result of similarities of the products and services offered by the focus group as earlier mentioned, the sample drawn from the population could be relatively homogenous. The homogeneity of the elements comprising the population makes it possible to ease the stringent sampling procedure required for generalization (Babie, 1990). Therefore, the generalization of current study's findings should not be an issue.

4.6 Sampling Size

A sample is used to make a generalization about the total population under study. Determining the sample size of a population of interest in research is made after considering the practical issues, the statistical precision desired, and the availability of resources. Ideally, a sample is selected using a random process to represent the population under investigation. There are various ways to determine a sample size. For example, Krejcie and Morgan's (1970) rule of thumb is one way to determine the sample size of a given population. Krejcie and Morgan provided a reference table to determine an adequate sample sizes based on the population of the study. The authors explained that the needed sample increases at a diminishing rate when the population increases to more than 100,000, and the sample size remain fixed at a slightly more than 380. Therefore, going by that table and with the total population of a little more than 5,000 the sample size of the current study would be 381.

Nonetheless, considering the possibility of the low response rate of the respondents, as Adomi, Ayo, and Nakpodia (2007) documented, this current study oversampled. Indeed, as Sekaran and Bougie (2010) argued that, to compensate for the non-response rate, researchers can increase the sample size. In this regard, Israel (2009) suggested that a researcher increase the sample size by at least 30% so as to accommodate the likely non-response rate. Babbie (1990) recommended even greater oversampling, contending that 50% is more appropriate in a social science survey.

Therefore, the current study first adopted the table given by Krejcie and Morgan (1970), which produced a figure of 381. Then, sample size was increased to 571 or by 50% (190), which is consistent with Babbie's (1990) recommendation. Such oversampling allows a researcher to recoup the possible decrease of the sample resulting from low responses, damage and or unreturned questionnaires (Salkind, 1997).

4.7 Unit of Analysis

According to Flynn et al. (1990), the unit of analysis in social sciences research may be systems, individuals, groups, departments, organizations, dyads, projects, plants, etc. The unit of analysis for this study is bank branches (organizations) in Nigeria. This is because all the variables of the study as depicted in the research framework affect the organization in general rather than specific staff or group of individual. The context of the current research was the banking sector in Nigeria, which was chosen in the current study due to its significant contribution to the Nigerian economy as highlighted earlier. The regional/branch managers and account managers of the banks are the respondents representing the banks. These targeted respondents are believed to have adequate information in the ways and manners in which AIT is utilized for enhancing effective performance.

Bank branches are the sole implementers of the banking strategies and decisions. Moreover, they are the primary sources of gain or loss in the organization and have a direct relationship with how AIT is managed. Therefore, managers and account

managers of the bank branches are believed to have better initiative and knowledge on the ways in which AIT will be optimally utilized so as to maintain an effective organizational control system that will ensure AIT usage.

Other have chosen such respondents for their banking studies. For example, Ringim, Razalli, and Hasnan (2012) studied the critical success factors of business process management in Nigerian microfinance banks. The instrument of the study was administered to bank branch managers and heads of departments. Similarly, in their study of leadership, self-efficacy and managerial performance in Nigerian commercial banks, Galoji, Ahamd, and Johari (2012) administered their research questionnaire to the bank branch managers. Besides studies in the same Nigerian context, Setia, Venkatesh, and Joglekar, (2013) distributed their survey instrument to branch and IS managers in Indian banks. Among others, these mentioned studies demonstrate that branch managers have been used as respondents in studies regarding the Nigerian banking sector and that of other countries. Hence, bank regional/branch managers and account managers of the banks are the respondents of this survey.

4.8 Operational Definitions and Measurement of Instruments

The proposed research framework of this study comprises eight latent constructs adapted from the extant relevant literature. These are system quality, information quality, service quality, internal control quality, training, top management support, and external consultant involvement. Six of the eight constructs of this study are operationalized reflectively because the direction of causality comes from the

construct to the indicators. System quality and information quality constructs are conceptualized as second-order formative constructs. To distinguish between a reflective and formative construct, Jarvis, MacKenser, and Podsakoff (2003) provided guidelines for researchers based on four criteria as follows: 1) the direction of causality between the constructs and its measures, 2) the interchangeability of the measurement items, 3) similarities in antecedents and consequences and 4) covariation between the measures. Table 4.2 shows the guidelines in detail.

Table 4.2
Decision Rules to Distinguish between a Reflective and Formative Construct

Item	Reflective	Formative
Direction of causality	The direction of causality is from the construct to the measurement.	The direction of causality is from the measurement to the construct.
Interchangeability of the indicators	Indicators should be interchangeable.	Indicators needs not to be interchangeable.
Are indicator expected to have similar antecedent and consequences	Indicators are expected to have the same antecedents and consequences.	Indicators are not expected to have the same antecedents and consequences.
Covariations among the indicators	Indicators are required to co-vary with each other.	Covariation among the indicators is not necessary.

Therefore, based on the review of the literature and the theoretical framework, all the eight constructs of this study were developed with multiple item scales. A 5-point Likert-type scale was used for each item of the survey instrument. Each construct in the survey instrument had negatively worded statement(s); this was done to minimize the problem of common method bias from the respondents.

Thus, the constructs are explained as follows:

1. Accounting Information Technology (AIT) usage refers to the use of hardware and software applications designed to implement the collection of data, measurement, and communication of information for the planning and control the operational activities of the banks. This construct was measured with seven items adapted from Shatat et al. (2013) and Hien et al. (2014).
2. System Quality (SysQty) is the degree of technical efficiency of the system, in terms of user interface consistency, ease of use, programming error and maintainability of the system. This construct was operationalized as a second-order formative construct with a first-order reflective construct, namely, security, ease of use, and efficiency. Furthermore, each dimension was measured with four items each, making a total of twelve items, which were all adapted from Chang et al. (2012).
3. Information Quality (InfQty) is the ability of the system to provide timely, accurate, relevant, and complete information to the user for effective decision making. The information quality construct was conceptualized as a second-order formative construct and measured with three first-order reflective dimensions: accuracy, timeliness, and completeness. The dimensions were measured with two, three, and two items respectively comprising a total of seven items. All were adapted from Saha et al. (2012).
4. Service Quality (ServQty) is the degree of responsiveness, assurance, and empathy of the bank IT units supporting the efficient operation of the

systems in the banks. The construct is operationalized as a reflective construct and measure with three first-order dimensions, namely, responsiveness, assurance, and empathy. Each dimension was measured with one item each, which was adapted from Kwan (2006).

5. Internal Control Quality is the mechanism adopted by the banks to safeguard and evaluate the accuracy and reliability of its accounting information to ensure the operational efficiency of the banks. Internal control quality was operationalized as a reflective construct in this study and measured with nine items adapted from Alzaoubi (2011).
6. Training is the extent to which an employee's skills- and knowledge-acquisition programs assist him/her in understanding how important the technology is and how it is related to his/her work and other functional areas within the organization so as to contribute to AIT usage. The training construct was also conceptualized reflectively and measured with seven items adapted from Argyropoulou (2011).
7. Top Management Support is the extent to which bank managers provide funds, guidance and all the necessary resources needed before and after the implementation of AIT. Top management support was conceptualized as a reflective construct, and this study adapted four items from Ifinedo (2008).
8. External Consultant Involvement is the engagement of a specialist who has the technical knowledge and experience about how AIT operates and can assist the users in understanding the system to utilize its potentials to the fullest. An external consultant involvement was measured with five items

that were adapted from Thong et al. (1994) and Moalagh and Ravasan (2013) and operationalized as a reflective construct.

4.9 Questionnaire Design

The items in the survey instrument were all adapted from previous studies. The cover page of the questionnaire briefly introduced the topic and the purpose of conducting the research and further solicits the objectives opinions of the respondents on the subject matter. There were two main parts of the questionnaire. Part one of the questionnaire comprised statements requesting the respondents to give their opinions by ticking the appropriate options. Part two comprised questions focusing on the demographic information of the respondents such as age, position, gender, and educational level. Table 4.3 presents the sources and modified research instrument.

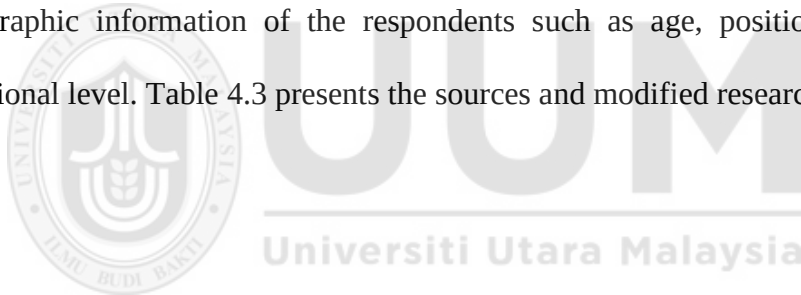


Table 4.3
Modifications of the Instruments

Construct	Original from Source	As Modified by the Researcher	Cronbach's alpha	Source(s)
AIT Usage	System Benefit		0.957	Shatat et al. (2013)
	The BIS achieves a competitive advantage for the organization.	The AIT assists our bank in achieving a competitive advantage.		
	The BIS contributes to develop ability for organization.	The use of AIT help in satisfying our customers.		Hien et al. (2014)
	The BIS contributes to the achievement of effective integrattion between departments.	The use of AIT does not facilitate effective integration between departments in our bank.	0.830	
	The BIS reduces costs.	The use of AIT does not assist in reducing costs.		
	The BIS can issue periodic reports on all the organization activities.	The use of AIT issues periodic report on all the organization activities for decision making.		
	Using the system you can save a lot of time.	The use of AIT allows our bank to save a lot of time.		
	You can manage your work effectively using the system.	The use of AIT enables us to manage our tasks effectively.		

Construct	Original from Source	As Modified by the Researcher	Cronbach's alpha	Source(s)
AIT Usage	Security		0.83	Chang et al. (2012)
	User login is required to access the hospital information system.	User login is required to access the online banking facilities.		
	Auto log out is enabled after a period of inactivity on the hospital information system.	Auto logout is enabled after a period of inactivity online.		
	The antivirus software prevents the hospital information system from being attacked by a virus.	The antivirus software does not prevent the systems from being attacked by a virus.		
System Quality	The hospital information system is regularly maintained and examined by personnel from the information office.	Our AIT is not regularly examined and maintained by IT unit staff.	0.93	
	Ease of use			
	The user interface of the hospital information system is easy to use.	The user interface of our bank information system is easy to use.		
	The tutorials or instructions provided by the hospital help me learn how to use the system easily.	The tutorials or instructions provided by our AIT help me to use the system easily.		
	The user interface design by the hospital is human oriented.	The user interface design by our AIT is user friendly.		
	I am clear about every function of the hospital information system.	I understand every function of the AIT.		
	Efficiency			

Information Quality	I am very familiar with the interface of the hospital information system.	I am not familiar with the interface of our AIT.	0.94	Saha et al. (2012)
	The user interface items of the hospital information system are quite easy to understand.	The user interface items of our AIT is easy to understand.		
	The hospital information system greatly helps to improve work efficiency.	Our AIT greatly facilitates my work efficiency.		
	The processing speed of the hospital information system affects my work speed.	The processing speed of the AIT assists me in accomplishing my work very fast.	0.863	
	Accuracy			
	Information in the web site is free from errors.	Our AIT does not provide me with accurate information.		
	This web site provides information precisely according to my need.	Our AIT does not provide me with relevant information.		
	Timeliness			
	The web site provides information I need at the right time.	Our AIT does not provides me with the necessary information in a timely manner.		
	Information on this web site is up to date.	The information contained in our website is timely and regularly updated.		
Information presented in the web site is related to the subject matter.	The information from our AIT improves the quality of my work.			

Service Quality	Completeness Information on this web site is sufficient for the task at hand.	Our AIT does not provide sufficient information related to task.	0.922	Kwan (2006)
	Information contained necessary topics to complete related task.	Our AIT provides me with a comprehensive information to complete my task.		
	Responsiveness When I have problem, the official WebSAMS support units will show a sincere interest in solving it.	When I have a problem, the official of the bank IT units show a sincere interest in solving it.		
	Assurance The employees of the official WebSAMS support units have the knowledge to maintain the system and solve problems well.	The employees of the bank IT units does not have the knowledge to maintain the system and solve the problems well.		
	Empathy The employees of the official WebSAMS unit have given me personal attention.	The employees of the bank IT units have never given me personal attention.		
Internal Control Quality	Internal Control ERP improves the controls of breaking through or trespassing the system.	Our AIT does not improve the controls of breaking through or trespassing of the system.		Alzaoubi (2011)

ERP regulates the access of professionals to the system according to their level of authorization.

Our AIT regulates the access of employees to the system according to their level of authorization.

ERP contributes in separating the discrepant tasks among the organization employees.

Our AIT contributes in segregating the discrepant tasks among employees in the bank.

ERP enables the linkage of all in and out terminals of the organization properly and appropriately.

Our AIT does not enable the linkage across all branches of the banks properly and appropriately.

ERP deals with all appropriate methods which provide security against the internal and external threats (example, antivirus).

Our AIT is in-effective in safeguarding against internal and external threats.

ERP provides proper documents that enable the controller to follow up work and evaluate the performance accurately.

Our AIT does not provide the document needed to follow up work and evaluate performance.

ERP provides the methods that ensure proper data entry and processing to the order obtain the required outputs.

Our AIT provides appropriate method that ensures proper data entry and processing in order to obtain the required output.

Training	ERP provides a library and archive to all files, programs and data which can be stored in separate tools.	Our AIT provides a library and archive to all files, programs and data which can be stored in separate tools.	0.951	Argyropoulou (2011)
	Training effectiveness			
	Training programmes are useful.			
	Training programmes covers specific needs.	The AIT training programs provided by my bank are not useful.		
	Training programmes covers your needs.	The AIT training programmes provided covers specific needs.		
	Training programmes are frequent.	The AIT training programmes provided does not cover our needs.		
	Training programmes are instructive.	The AIT training programmes are organised regularly		
	Training programmes are cost effective.	The AIT training programmes are not educative.		
Top Management Support	Training programmes helps you learn the various system's uses.	The AIT training programs are cost effective.	0.76	Ifinedo (2008)
	Top Management Support			
	Top management supports the adoption and use of our ERP systems.	Top management does not provide the resources needed for the		

External Consultant Involvement		implementation of our AIT systems.		
	Different departments are of equal importance.	Every departments are of equal importance.		
	Employees are happy with the changes that the top management decides on ERP issues.	I am not satisfied with the changes that the top management decides on AIT issues such as financial support.		
	Top management support freely shares information in our organization.	Top management encourages the sharing of information in our bank.	0.83	Thong et al. (1994)
	Consultant effectiveness Effectiveness in performing information requirement analysis.	Our consultant is effective in performing information requirement analysis.		
	Effectiveness in recommending suitable computerization solution.	Our consultant is effective in recommending suitable AIT solution.		Moalagh and Ravasan (2013)
	Our consultant response promptly to emergency situation.	Our consultant does not response rapidly in case of emergency.		
	Our consultant has a good relationship with my organization.	Our consultant facilitates internal relationship.		

Our ERP consultant provides adequate technical support.

Our consultant does not provide adequate technical support if needed.



Part one of the questionnaire comprised a total of fifty-three statements, representing each variable that asked the respondents to indicate their level of agreement or disagreement about the statements. A 5-point Likert-type scale (i.e., strongly disagree, disagree, not sure, agree, strongly agree) was used to measure the items in part one because this is one of the most widely-adopted scales in social science research (Martins & Garland Jr., 1991). The argument has been made that a Likert-type scale of more than 5 points usually confuses the respondents (Ackfeldt & Coote, 2005). Similarly, Sekaran and Bougie (2009) claimed that a 5-point Likert-type scale produces nearly the similar precision as other Likert-type scales do. Thus, a 5-point Likert scale is assumed to be more appropriate for this study.

4.10 Pre-Test

The pre-test was carried out to ensure completeness and clarity of the measures, Creswell (2009) suggested that the questionnaire should be presented to experts to determine the face validity of the questions. This is considered as an iterative process aimed at improving the survey instrument. The pre-testing of a paper-based survey instrument normally deals with issues whether the questions are understandable and clear. In the process, the survey instrument may have to be re-written or re-structured. At this step, the focus is more on several technicalities issues of the survey instrument such appropriate wordings and clear instructions (Synodinos, 2003). Based on this understanding, the pre-testing of the survey instrument was carried out in which five experts in the field of AIT and research methodology in School of Accountancy, University Utara Malaysia were asked to review and comment on the initial

questionnaire. After this review that occurred in November 2015, the questionnaire was improved after the inclusion of the suggestions and comments of the experts.

4.11 Pilot Test

A pilot study is preliminary survey that is usually carried out on a scale smaller than the main study to assess the variability of methods, procedures, retention, and implementation of a novel intervention in a scientific enquiry (Leon, Davis, & Kraemer, 2012). Thus, to confirm the reliability of the measurement scales a pilot test was conducted for this study. Specifically, 50 questionnaires were personally distributed to the study sample in May 2016. Thirty-two usable questionnaires were obtained and used for evaluating the reliability of the reflective latent constructs. The number of the returned questionnaires is considered sufficient following Callegaro, Manfreda, and Vehovar's (2015) recommendation that 15-30 respondents were the minimum number required for a pilot study.

The returned questionnaires comprised two formative constructs, six reflective constructs, and six dichotomous variables to be validated through the pilot survey instrument. Reliability analysis is required for a reflective construct, but not for a formative construct Coltman, Devinney, Midgley, and Venaik (2008). Hence, the reliability analysis conducted in the pilot study was only for the six reflective latent constructs. The results are presented in Table 4.4.

Table 4.4
Pilot Study for Reliability Analysis

Reflective Latent Construct	Number of Items	Cronbach's alpha
Accounting Information Technology Usage	7	.818
Service Quality	3	.436
Internal Control Quality	8	.826
Training	7	.717
Top Management Support	4	.657
External Consultant Involvement	5	.744

Note: Statistics developed using SPSS version 20.

The results of internal consistency analysis conducted using Cronbach's alpha show that all the reflective latent constructs except for service quality met the minimum required alpha of .60 and above, therefore, revealing strong internal consistency reliability. However, the service quality construct was retained for the full-scale study because one possible explanation of the inability of the construct to meet the minimum threshold may be due to the small number of responses collected for the pilot study. Thus, the Cronbach's alpha construct was forecast to improve at the end of the full-scale study. A copy of the survey instrument is attached as Appendix B.

4.12 Data Collection Procedure

This study employed a quantitative research approach, which primary data were gathered through the administering the survey instrument to the targeted respondents. The respondents of current study include regional/branch managers and account managers of all the 21 commercial banks listed on the NSE. The data collection procedure started with the researcher personally meeting with the banks' representatives to explain the nature and purpose of the study and to discuss the number of potential respondents required to fill the paper-based survey. Subsequently, the

questionnaire was administered personally to the 571 targeted respondents. This was achieved with the help of the operations manager of the banks.

According to Sekaran and Bougie (2010), the personal administration of a research instrument to respondents is less expensive and saves times with respect to other methods. In essence, the approach proved to be efficient especially in the context of Nigeria in which a research culture is not fully developed. For instance, Asika (1991) revealed that the rate of return of mailed survey is between 2% and 4%. Therefore, the drop- and collect-method was employed in the current study to improve the response rate and to facilitate quick retrieval of the completed questionnaire. Moreover, the method enables a researcher to clarify any doubts that a respondent might have about the research instrument.

The survey period was left open for a four month-period lasting from June to September 2016. During the first two months 154 valid responses were received representing 26.97% of the total distributed. Afterwards, follow-ups and phone calls were continuously made to the representatives requesting them to remind potential respondents to fill in the research instrument. The approach was applied to gather more surveys because previous study has revealed that follow-ups can increase the response rate significantly (Maiyaki, 2012). As a result, 122 responses were further retrieved, which increase the overall valid responses to 276 representing about 43.3% of the total surveys distributed. The total number of respondents is considered adequate for the intended analysis.

4.13 Data Analysis

This section discussed the analysis techniques that were used to evaluate the survey data. The Statistical Package for the Social Sciences version 20 was used to determine the descriptive statistics, the independent sample t-test for response bias of the respondents and other preliminary data screening analyses. Then, a discussion of Partial Least Square path modeling was presented, which was used for the assessment of both the measurements and structural model evaluation.

4.13.1 Descriptive Statistics

Tabachnick, Fidell, and Osterlind (2001) noted that descriptive statistics provide summaries and characteristics of the data in relationship to a construct or combination of constructs. They further stated that descriptive statistics provide reliable differences, relationships, and estimates of subject values that ensure consistent findings. When reliable differences are present, these statistics are normally used to provide both measures of central tendencies and measures of dispersion. Therefore, descriptive statistics provide a better understanding and clarification of the impact of the research report (Hair et al., 2007). The most commonly used descriptive statistics are the mean, median, mode, minimum, maximum, variance, and standard deviation. In this study, the mean, minimum, maximum, and standard deviation were computed for the latent constructs to summarize and present the data in a logical manner using SPSS.

4.13.2 Independent Sample t-test for Non-Response Bias

The independent sample t-test for non-response bias was conducted to compare early and late responses. Olson (2006) argued that one common argument that leads to a non-

response bias test is that those respondents brought into the response pool through a researcher's additional persuasive efforts may provide data that can result in a measurement error. Therefore, to ensure no differences between the responses collected from those who initially and those who responded after additional persuasive efforts, a non-response bias test was conducted. To determine the groupings for the t-test, Sekaran and Bougie, (2009) stated that, to carried-out non-response bias test, the dates at which the research instrument are collected from the respondents should be recorded, and subsequently, the means of early and late responses are computed and compared. As such, this test was conducted to determine whether significant statistical differences existed between early and late responses. The responses collected in the first two months were considered early and those collected after that time period were considered late.

4.13.3 Other Data Screening Analyses

Other data screening was also conducted to meet the pre-conditions for multivariate analyses. Data screening provides the researcher with an understanding of whether the assumptions of multivariate data analyses have been violated (Hair et al., 2007). Thus, performing the preliminary analysis enables the researcher to understand the extent of data fitness for the intended analysis. Hair, Black, Babin, and Anderson (2010) pointed out that data screening and preliminary analysis comprises four issues that include: 1) identification and treatment of missing values, 2) identification and treatment of outliers, 3) normally tests, and 4) multicollinearity tests.

4.13.4 Partial Least Square Model Evaluation

Partial Least Square is one of the two types of Structural Equation Modeling (SEM) techniques. The two types of SEM are Covariance-SEM and Component-based SEM. PLS is part of component-based SEM, and reasons exist for using either of the techniques in research work (Hair, Ringle, & Sarstedt, 2011). The rules of thumb for selecting CB-SEM and PLS-SEM are presented in Table 4.5.

Table 4.5

Rules of thumb for selecting Covariance-SEM and PLS-SEM

Issue	Covariance-SEM	PLS-SEM
Research Goals	Theory testing, confirmation, and comparison	Exploratory research, Predicting target construct, and extension of an existing structural theory
Measurement Model specification	Mostly reflective measures	Both reflective and formative measures
Structural Model	Non-recursive model	Complex model
Assumptions	Parametric with sample size and data distribution assumptions	Non-parametric and does not require assumptions to fulfilled
Sample Size	Required large sample	Both small and large
Model Specification	If research required goodness- of-fit criterion	If research will use latent construct scores in subsequent analyses

Note. Adapted from Hair et al. (2011). PLS-SEM: Indeed, a silver bullet. *The Journal of Marketing Theory and Practice*, 19(2), 145.

Considering the outlined rule of thumb in Table 4.5, PLS-SEM seems more appropriate in this study for three reasons. First, this study does not test or compare theories but is an exploratory research aimed at predicting the influence of AIT determinants on AIT usage in Nigerian banking sector. Thus, a model is proposed for that purpose. Second,

the current study comprises reflective and formative constructs. Third, the model is structured to examine both the direct and indirect effects of the constructs under investigation, so is considered as somewhat complex.

In addition, PLS is a multiple regression analysis that allows a simultaneous testing of multiple variables and does not make distributional assumptions other than the prediction of the model (Chin et al., 2003). Chin et al. (2003) further stated that under this technique, the PLS algorithms try to collect the best weight estimates for the respective group of indicators corresponding to each latent construct, and thus provide an accurate definition of component scores by avoiding interdependency problems. The component scores produced for the respective latent construct would be maximized the variance to explain the dependent variable. Based on the reasons above, PLS is considered more appropriate for this study. The following sub-sections discuss the procedures for evaluating measurement and structural models when using SEM-PLS.

4.13.4.1 Measurement Model Evaluation

The evaluation of a measurement model differs for reflective and formative constructs. A formative construct is different from a reflective construct in terms of reliability and validity measurements. Thus, a discussion on measurement model assessment by the construct type is as follows.

Formative Construct: When analysis involves a formative construct, the reliability test that is conducted through convergent validity and internal consistency is unnecessary because the indicators or items are not expected to be highly correlated and thus are

assumed to be free from error. Therefore, the theoretical basis and expert opinions play an important role in measuring formative indicators (Hair et al., 2011). Nonetheless, SEM-PLS offers more significant criteria for the statistical evaluation of measurement quality for formative indicators.

The first is to examine indicators weights and loadings and assess their significance level through a bootstrapping procedure. The minimum number required for a sample of bootstrapping is 500; furthermore, the number of cases should be same as the number of observations in the original sample.

The significance level for indicator weights and loadings are evaluated using the t-value. The t-values for significance for a two-tailed test are 2.58, 1.96, and 1.65, which are at the 1%, 5%, and 10% confidence levels respectively. Where the indicator weights are significant, all the indicators are retained. However, if both the weights and loadings are insignificant, then no empirical basis exists to retain the indicators.

The second is examining the multicollinearity. The assumption is that the value of Variance Inflation Factor (VIF) should be less than 5 for each indicator to prevent high multicollinearity.

The third, where high numbers of indicators are used in measuring a formative construct, and some are not significant, the items should be separated into different constructs if there is theoretical support for doing so.

Reflective Indicators: In contrast from a formative construct, reliability, and validity assessment play an important role in evaluating the measurement model with reflective constructs. Regarding validity, a reflective construct should meet the discriminants and convergent validity assumptions. First, for convergent validity, these conditions are assessed using the Average Variance Extracted (AVE) that should be greater than .50, which implies that the variance explained by the latent variable for its indicator is 50% and above (Hair et al., 2011). Second, with respect to discriminant validity, the AVE of each latent variable is required to be greater than the highest squared correlation of the latent variable with any other variable in the research model. Furthermore, the indicator loading is required to be higher than all of its cross-loadings (Hair et al., 2011). The reliability of the construct can be measured through two methods. Reliability can be measured through Cronbach's alpha or composite reliability, and the threshold is that internal consistency should be greater than .70 using either Cronbach's alpha or composite reliability. However, when the research is exploratory, .60 to .70 is acceptable, and an indicator loading should be higher than .70 (Hair et al., 2011).

4.13.4.2 Structural Model Evaluation

In evaluating the structural model, four assessments are important, which include: 1) the assessment of R^2 values, 2) assessing the significance of path coefficients through bootstrapping procedure, 3) assessing the model's predictive relevance, and 4) the assessment of effect size of each of the independent construct to the latent dependent construct. These are further discussed below:

R-square: R^2 is important in assessing the structural model predictive ability. The value of R^2 provides the total variation in the latent dependent construct explained by the independent constructs (Hair et al., 2011). R^2 can be evaluated in two different ways: 1) either the effect of an independent construct on the dependent construct, or 2) the endogenous latent constructs in the model. Concerning the effect of an independent construct on the dependent construct the values of .35, .15, and .02 are considered large, medium, and small effect respectively (Cohen, 1988). However, in the case of the overall effect on the endogenous latent construct the values of .75, .50, and .25 are considered substantial, moderate, and weak respectively (Hair et al., 2011).

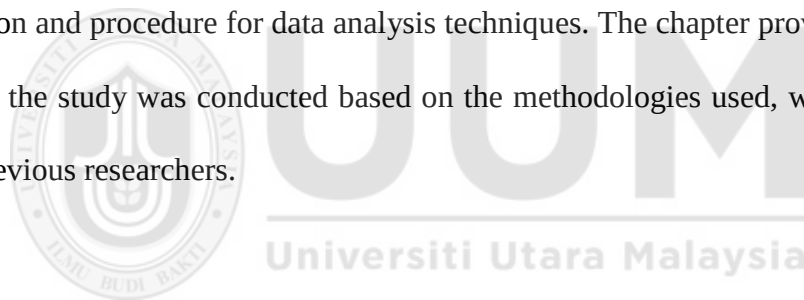
Path Coefficients: The bootstrapping procedure is used in evaluating the significance of path coefficients. In this case, the minimum number of the bootstrapping sample is 500, and the number of cases should same as the number of observations in the initial sample. Furthermore, concerning the path coefficients, the critical values for two-tailed tests are 2.58, 1.96, and 1.65 at 1%, 5%, and 10% significance levels respectively (Hair et al., 2011).

Predictive Relevance: This is another procedure for evaluating a structural model by assessing the model's ability to predict. This type of analysis is conducted through Geisser's Q^2 , which proposes that the model can predict each of the indicators of the endogenous latent variables (Hair et al., 2011). Therefore, a Q^2 value above zero indicates that the exogenous variable has a predictive relevance for the endogenous variable being considered.

The Effect Size: This is normally conducted to determine the extent to which each of the independent variables contributes independently to the explanation of the dependent variable. The effect size is assessed using f^2 (Cohen, 1988). Therefore, the values of .35, .15, and .02 are considered large, medium, and small respectively.

4.14 Summary

The chapter discussed the research design and the various techniques used in conducting the study, through which the research questions and objectives are achieved. It further discussed the operationalization of the variables, the population, units of analysis, and the sampling technique used in the study. The chapter discussed the data collection and procedure for data analysis techniques. The chapter provides guidelines on how the study was conducted based on the methodologies used, which are in line with previous researchers.



CHAPTER FIVE

DATA ANALYSIS AND FINDINGS

5.1 Introduction

This chapter discussed the procedures the researcher followed to analyze the data and the justification for using particular analysis technique. The questionnaires were keyed into SPSS after checking for incomplete or straight line responses. These screenings are in line with procedures recommended in different literature such as Hair et al. (2007), Hair et al. (2010), and Green and Salkind (2010). Data were then checked for missing values, outliers, normality, and multicollinearity. The chapter also presents the demographic information of the data through descriptive statistics. The model was assessed in two stages, measurement and structural models. Finally, the hypotheses were tested for direct and moderating paths, and a summary of the chapter was presented at the end.

5.2 Distribution of Survey Instrument and Response Rate

In conducting the study, 571 questionnaires were distributed to all the commercial banks across three states from the three geo-political zones of Nigeria in June 2016. After several follow ups for retrieval, survey collection was ended at the end of September 2016, and a total of 287 questionnaires were returned. The retrieved questionnaires represent 50.4% response rate. Of the 287 returned 11 questionnaires were significantly incomplete, thereby making them unusable for analysis. The remaining 276 representing about 48.3% were used for further analysis. This response rate is considered satisfactory for analysis. Iacobucci and Churchill (2009) stated that a

response rate of 12% to 20% is satisfactory, and Sekaran (2003) suggested that a response rate of 30% is adequate for the survey. Table 5.1 presents the breakdown of the response rate.

Table 5.1
Questionnaire Response Rate

Response	Number
Number of questionnaires distributed	571
Number of questionnaires returned	287
Number of questionnaires excluded	11
Number of questionnaires returned and usable	276
Response rate	50.4%
Valid response rate	48.4%

5.3 Accounting Information Technology Subsystem

This section discussed the views of respondents on the types of AIT subsystems used. The subsystems examined included transaction processing, general ledger/financial reporting, and management reporting systems. Table 5.2 shows the breakdown of the type of AIT used.

Table 5.2
Accounting Information Technology Subsystem

Subsystem	Frequency	Percentage
TPS and GLFRS	59	21.4
TPS and MRS	39	14.1
GLFRS	3	1.1
GLFRS and MRS	13	4.7
TPS, GLFRS, and MRS	162	58.7
Total	276	100

Source: SPSS Statistics

Table 5.2 indicated a high level of variability regarding frequency for types of the subsystem used by the banks. Based on the responses, the most commonly used

subsystems are transaction processing, general ledger/financial reporting and management reporting systems with 58.7%. Then transaction processing and general ledger/financial reporting system amounted to 21.3%. These results were consistent with Belfo and Trigo's (2013) classification of AIT subsystems. The table further indicated that 14.1% said that they used a transaction processing and management reporting system. While a general ledger/financial reporting system and management reporting system had 4.7% and only 1.1% of the respondents said that a general ledger/financial reporting system was used.

5.4 Respondents' Demographic Information

This section discussed the demographic information respondents, and this includes age, gender, qualification, and position. Table 5.3 shows the demographic characteristics of the respondents.

Table 5.3
Demographic Profiles of the Respondents

Demographic Profile	Frequency	Percentage
Age		
Below 30 years	44	16.1
30-39 years	138	50.5
40-49 years	77	28.2
50-59 years	14	5.1
Total	273	100.0
Gender		
Male	237	85.9
Female	39	14.1
Total	276	100.0
Qualification		
Diploma	10	3.6

Degree	153	55.5
Masters	111	40.2
PhD	2	0.7
Total	276	100.0
Working Experience		
Below five years	79	28.8
5-9 years	130	47.4
10-14 years	47	17.2
15 years and above	18	6.6
Total	274	100.0
Position		
Regional/Branch Manager	74	28.4
Account Manager	187	71.6
Total	261	100.0

Table 5.3 revealed that 16.1% of the respondents were below the age of 30 years, 50.5% were within 30 to 39 years, 28.2% were 40 to 49 years, and the remaining 5.1% of the respondents were 50 years and above. About 85.9% of the respondents were male, whereas 14.1% were female. These findings signify that majority of the respondents under the gender category were male. Of the respondents, 3.6% had a diploma, 55.5% had a degree, and while 40.2% and .70% had a Masters and Ph.D. respectively. This implies that significant numbers of the respondents are educated; hence, they are in good position to answer the survey instrument. Furthermore, about 28.8 % of the respondents had working experience of less than five years, 47.4% had 5 to 9 years, 17.2% had 10 to 14 years, while only 6.6% of the respondents had working experience of 15 years and above. These findings show that the majority of the respondents have adequate working experience. With respect to position, 28.4% of the respondents were

regional/branch managers, and 71.6% were account managers. This indicates that the appropriate targeted respondents completed the survey instrument.

5.5 Data Screening and Preliminary Analysis

Data screening and preliminary examination of the research instruments are important to determine whether the data set meets the necessary requirements for multivariate analysis. Such an analysis enables the researcher to check if there are straight line responses, omissions, and inconsistencies, which are violations of multivariate analysis assumptions (Hair et al., 2007). Thus, this allows the researcher to understand the extent of data fitness for the intended analysis. As such, Hair et al. (2010) contended that data screening and preliminary analysis comprises four issues. These include: 1) identification and treatment of missing values, 2) treatment of outliers, 3) normality and 4) multicollinearity tests. Hence, these steps were followed in the screening and preliminary analysis of the data.

Before the commencement of the data screening, SPSS version 20 was used for data coding and entry. The SPSS variable view was customized to suit the objectives of the analysis. First, serial numbers were assigned to each case to assist in detecting outlier cases more easily. Then, this was followed by the labelling of the demographic variables, while all the items in the research instrument were labelled with codes. The decimal, width values, and type were also specified based on data coding and entry procedure demonstrated in Green and Salkind (2010). After the data was keyed-in, a frequency was run to detect data entry error. This led to the discovery of two (2) errors, which were out-of-range entry errors. The errors were subsequently corrected.

5.5.1 Identification and Treatment of Missing Values

The study had 14,628 data points (i.e., 53 items multiplied by 276 cases) excluding categorical variables. Of this set, 57 data points were randomly missed, which accounted for about 0.004%. Specifically, system quality (SYSQTY) variable was found with the highest number of missing values for the variables in the research framework, and eighteen missing values were detected in the variable. This was followed by accounting information technology usage (AIS usage), training (TR) and internal control quality (INCO) with fifteen, eight, and seven missing values respectively. Information quality (INFQTY) variable had four missing values, top management support (TMS) had five missing values, while no missing values were detected from external consultant involvement (EXCO) and service quality (SERQTY) variables.

Tabachnik and Fidell (2007) argued that missing values of 5% and below are considered insignificant. The authors, therefore recommended that, where the missing values are less 5%, mean replacement is the most common method for substituting. The missing values of this study were replaced with the series mean using SPSS. Tables 5.4 to 5.12 show the variables and their respective missing values.

Table 5.4
Missing Values Analysis by Respondent Demographics

	Age	Gender	Qualification	Working Experience	Position
Valid	273	276	276	274	261
Missing	3	0	0	2	15

Table 5.5
Accounting Information Technology Usage

	AITU1	AITU2	AITU3	AITU4	AITU5	AITU6	AITU7
Valid	276	276	276	275	276	274	268
Missing	0	3	4	1	0	2	5

Table 5.6
System Quality

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
Valid	276	276	274	276	270	276	276	271	276	276	271	267
Missing	0	0	2	0	0	0	0	5	0	0	6	5

Table 5.7
Information Quality

	INF1	INF2	INF3	INF4	INF5	INF6	INF7
Valid	276	276	276	276	275	273	276
Missing	0	0	0	0	1	3	0

Table 5.8
Service Quality

	SERQTY1	SERQTY2	SERQTY3
Valid	276	276	276
Missing	0	0	0

Table 5.9
Internal Control Quality

	INCO1	INCO2	INCO3	INCO4	INCO5	INCO6	INCO7	INCO8
Valid	274	273	276	276	276	274	276	276
Missing	2	3	0	0	0	2	0	0

Table 5.10
Training

	TR1	TR2	TR3	TR4	TR5	TR6	TR7
Valid	276	276	276	276	274	265	276
Missing	0	0	1	2	2	3	0

Table 5.11
Top Management Support

	TMS1	TMS2	TMS3	TMS4
Valid	276	272	276	275
Missing	0	4	0	1

Table 5.12
External Consultant Involvement

	EXCO1	EXCO2	EXCO3	EXCO4	EXCO5
Valid	276	276	276	276	276
Missing	0	0	0	0	0

5.5.1 Identification and Treatment of Outliers

The outlier is a data point with a value that is highly different from the rest of the data based on a metric (Aggarwal & Yu, 2001). The occurrence of an outlier in a data set has the likelihood of arbitrarily distorting t values for estimators, which may render the results of the analysis meaningless for practical application (Hair et al., 2014). Even though having outliers in a dataset is not an issue in PLS because the application can handle non-normal data (Hair et al., 2011); however, it is important to examine the dataset for such cases and provide a solution if detected. Thus, data were examined for multivariate outliers using the Mahalanobis distance D^2 approach, following the recommendations of Pallant (2011) and Tabachnik and Fidell (2007).

The Mahalanobis distance D^2 approach is defined as “the distance of a case from the centroid of the remaining cases where the centroid is the point created at the intersection of the means of all the variables” (Tabachnik & Fidell, 2007, p. 74). With 53 observed items, the corresponding chi-square was 89.272 ($p = 0.001$) and based on this benchmark value a total of 16 outliers were identified in the dataset. These outliers were later deleted because they could distort the accuracy of the statistical estimations. Therefore, the identified outliers were removed, and the final data set stood at 257 cases.

5.5.2 Normality Test

Normality is an important step in the assumption of multivariate analysis (Tabachnick & Fidell 1996). Normality refers to a “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 tests requires that data should normally be distributed, specifically for covariance-based structural equation modeling (Chin et al., 2003; Hair et al., 2007a). The procedure provided in Hair et al. (2013) was followed to assess the normality of the data in this study. They claimed that normality tests using the Kolmogorov-Smirnov test and the Shapiro-Wilk test provide limited guidance on whether or not data are normally distributed. Therefore, the suggestion is that skewness and kurtosis should both use thresholds of ± 2.58 .

In addition, an argument exists that the popular statistical approach for testing normality has a low power of estimation. Therefore, the recommendation is that normality should be assessed using both visual and statistical methods (Ghasemi & Zahediasl, 2012). Additionally, Tabachnik and Fidell (2007) also recommended that normality should be tested using both graphics and statistics. Thus, in line with these recommendations, normality tests were conducted using the visual method, skewness, and kurtosis so as to ensure that the complete dataset does not violate the assumptions of a normality test. Figure 5.1 presents the visual presentation of the normality of the data, which by visual inspection does not violate the normality assumption. While Table 5.13 presents the skewness and kurtosis of all the observed variables, which, shows they are less than the required threshold of ± 2.58 .

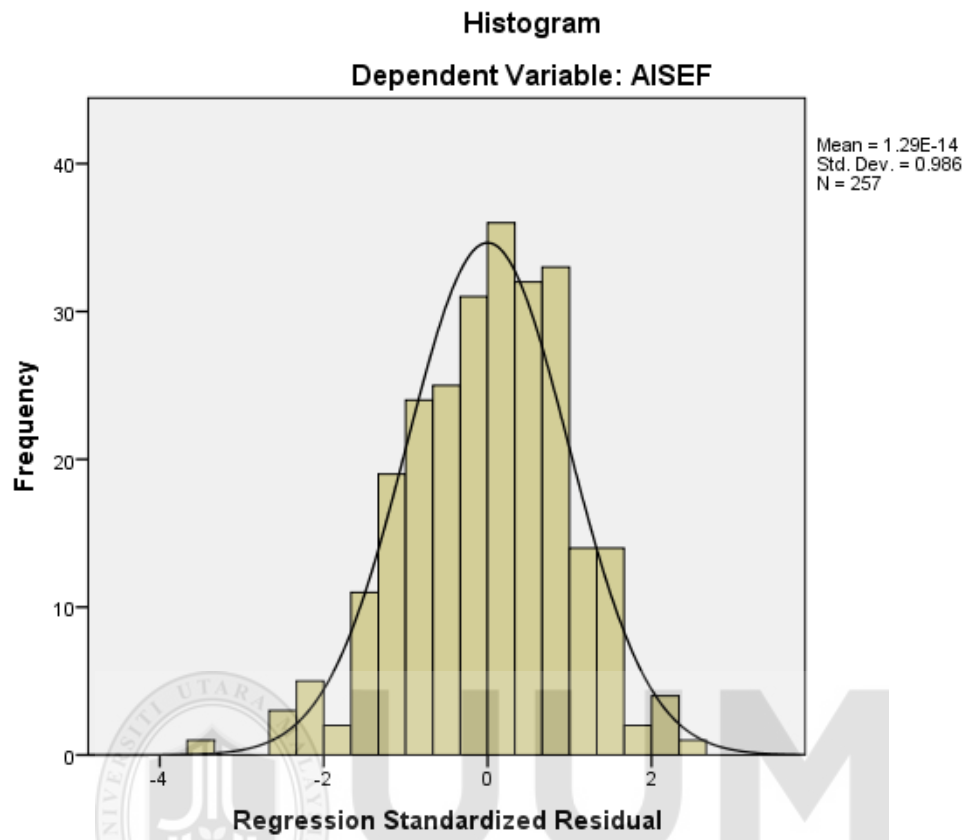


Figure 5.1. Histogram for Normal Distribution.

Table 5.13
Skewness and Kurtosis (n =257)

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Accounting Information Technology Usage	-.379	.152	.072	.303
System Quality	-.376	.152	.070	.303
Information Quality	-.906	.152	.638	.303
Service Quality	-1.148	.152	1.262	.303
Internal Control Quality	-.535	.152	-.216	.303
Training	-.837	.152	.868	.303
Top Management Support	-1.138	.152	1.117	.303
External Consultant Involvement	-.777	.152	.355	.303

5.5.3 Multicollinearity Test

Multicollinearity is the relationship between multiple independent variables. It a phenomenon in which two or more exogenous latent variables have a high level of correlation (Tabachnick & Fidell, 2007). The implication is that both variables are telling the same thing as regard to the research model. Subsequently, this can significantly distort the estimates of coefficients of a regression model and their statistical significance (Tabachnick & Fidell, 2007). The ideal situation is one in which little linear correlation is anticipated between the independent variables, while a high correlation holds between the independent and dependent variables.

There are two common approaches in detecting if multicollinearity exists in the dataset. First, Hair et al. (2010) and Tabachnick and Fidell, (2007) suggested that the inter-construct correlation matrix should be evaluated to determine whether any two

predictor variables are highly correlated. They recommended a threshold of $> .90$ as the yardstick to indicate multicollinearity. Based on this threshold Table 5.14 indicates no inter-predictor correlation surpassed the benchmark.

Table 5.14
Pearson Correlations (Multicollinearity)

	SysQty	InfQty	SerQty	Internal	Training	Top	External
System	1						
Information	.554**	1					
Service	.315**	.388**	1				
Internal	.564**	.588**	.381**	1			
Training	.490**	.565**	.234**	.501**	1		
Top Mgt.	.343**	.255**	.073	.394**	.277**	1	
External	.392**	.387**	.230**	.384**	.496**	.303**	1

The correlation matrix table indicated no inter-predictor correlation surpassed the recommended threshold value. In fact, the highest correlation was between internal control and information quality was .588.

Second, Tolerance and Variance Inflation Factor (VIF) is another approach used in assessing the multicollinearity (Hair et al., 2013). Tolerance refers to the variance of one exogenous variable not explained by any other exogenous variable in the model, whereas VIF refers to as the reciprocal of tolerance (Hair et al., 2013). They further claimed that a tolerance value of .20 or lower and a VIF of 5 or higher showed potential problems of multicollinearity. Table 5.15 shows the results of multicollinearity using tolerance and VIF values.

Table 5.15
Multicollinearity Test using Tolerance and VIF

Exogenous Variable	Collinearity Statistics	
	Tolerance	VIF
System Quality	0.564	1.773
Information Quality	0.501	1.994
Service Quality	0.794	1.259
Internal Control Quality	0.503	1.989
Training	0.555	1.801
Top Management Support	0.792	1.263
External Consultant Involvement	0.697	1.435

The tolerance and VIF values as presented in Table 5.15 showed that multicollinearity did not exist among the independent variables. All the tolerance values of the construct are above the minimum threshold of .20, and the VIF has values of less than the benchmark of 5 as Hair et al. (2013) suggested. Thus, the conclusion can be made that the multicollinearity tests results presented above revealed that no high correlation exists among the exogenous variables.

5.6 Descriptive Statistics of the Latent Constructs

This section discussed the descriptive statistics of the latent constructs. Categorical variables of the study are not included, simply because the answers are categorical in nature. For instance, for every category, the responses were coded as 1 when a particular category was selected and 2 if not selected. While for the latent variables, the minimum and maximum scores, the mean, and the standard deviation were computed. The measurement for all the latent variables is based on a 5-point Likert-type scale ranging from 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree and 5 = strongly agree. The 5-point scale was classified into three categories: 1) low (scores of 1 to 2), 2) high (scores of 4 to 5), and 3) a score in between the two categories was considered as moderate. Table 5.16 shows the descriptive statistics of the variables.

Table 5.16

Descriptive Statistics of the Latent Constructs (n = 257)

	Min	Max	Mean	Std. Deviation
System Quality	1	5	4.01	.520
Information Quality	1	5	4.23	.581
Service Quality	1	5	4.07	.602
Internal Control Quality	1	5	4.13	.541
Training	1	5	4.29	.555
Top Management Support	1	5	3.51	.534
External Consultant	1	5	4.44	.665

Note: Dependent Variable: AIT usage.

Table 5.16 shows that the mean responses ranged from 3.51 to 4.44 for all the latent variables. Specifically, the mean of system quality was 4.01, and the standard deviation was .520, showing that the respondents agreed that system quality influences AIT usage in the Nigerian banking sector. Information quality had a mean of 4.23 and standard deviation of .581 indicating that the respondents viewed information quality as a relevant tool for AIT usage. Service quality, internal control quality and training had means of 4.07, 4.13, and 4.29 respectively with standard deviations of .602, .541, and .555 respectively, which showed that respondents viewed service quality in determinants of AIT usage as high. Top management support had a mean of 3.51 with a standard deviation of .534, indicating that the respondents moderately agreed that top management support could affect AIT usage in the Nigerian banking sector. Lastly, external consultant involvement had a mean of 4.44 with a standard deviation of .665, showing that the respondents considered external consultant involvement as a relevant tool for AIT usage.

5.7 Independent Sample *t*-test for Early and Late Responses

Non-response bias refers to the difference in answers between early and late respondents (Lambert & Harrington, 1990). As earlier stated, the data collection was expected to be completed within a two-month period from June to July 2016. However, due to low response and the desire to maximize the response rate, the collection period was increased by two more months from June to September 2016. The extended period was associated with a high level of follow-up through revisiting the respondents. Time-trend extrapolation as a mean of assessing non-response bias was recommended by Armstrong and Overton (1977), whereby the early response is compared with the late response.

Therefore, to examine if a high-level follow-ups resulted in a response bias, a comparison between early and late responses was carried out in accordance with the recommendation. The responses were classified into two groups: early and late responses. Those responses retrieved within the first two months (June to July 2016) amounting to 154 valid responses were classified as early responses. The remaining responses were collected after the follow-up period (August to September 2016), which amounted to 122 valid responses. These were classified as late responses. An independent sample *t*-test was carried out to assess whether non-response bias existed among the independent and dependent variables as presented in Table 5.17.

Table 5.17

Independent Sample t-test for Non-Response Bias

			Levene's Test for Equality of Variance		t-test for Equality of Means		
Variables	Response	N	F	Sig.	T	Mean	Sig. (2- tailed)
AIT Usage	Early	149	.045	.832	-1.380	-.075	.169
	Late	108			-1.387	-.075	.167
System Quality	Early	149	1.783	.183	-.781	-.034	.436
	Late	108			-.793	-.034	.429
Service Quality	Early	149	1.228	.269	.762	.060	.447
	Late	108			.734	.060	.464
Training	Early	149	.692	.406	-.572	-.037	.568
	Late	108			-.563	-.037	.574
Top							
Management Support	Early	149	.207	.650	-.679	-.064	.498
	Late	108			-.675	-.064	.501
External Consultant	Early	149	.046	.831	-1.490	-.118	.138
	Late	108			-1.488	-.118	.139
Information Quality	Early	149	1.064	.304	-1.564	-.108	.120
	Late	108			-1.573	-.108	.118
Internal Control Quality	Early	149	.323	.571	-1.310	-.143	.122
	Late	108			-1.340	-.143	.120

Source: SPSS Statistics

Based on Table 5.17 presented the results of the independent t-test using Levene's test for the equality of variances and the t-test for equality of means and showed that there was an equality of variances and means between early and late responses. Levene's test of .05 and above and the t-test (sig. 2-tailed) of .05 and above revealed an equality of variance and mean respectively (Pallant, 2011). Significant values of less than .05 in each case showed that variances and means were not equal. Therefore, the results implied that no problem of non-response bias was present in the study.

5.8 Common Method Bias

Common method bias has become a major concern for survey researchers (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The common method bias is the extent to which correlations are inflated as a result of method's effect (Meade, Watson, & Kroustalis, 2007). Organ and Ryan (1995) stated that the studies conducted based on survey designs report inflated and spurious correlations between the observed variables due to common method bias. Therefore, a researcher must conduct a common method bias test to reduce the possible effect of generating measurement error (Conway & Lance, 2010). Specifically, the current study employed a survey research design through self-administering the research instrument to bank employees. Because the data collected were from a single source, this makes the data vulnerable to common method bias.

To minimize the possibility of the occurrence of common method variance, this study employed statistical techniques and procedural remedies before the commencement of the data collection Baumgartner and Wejters (2012) suggested. Some of the procedural remedies applied in this study include the following. First, the research instrument was appropriately designed with simple and easy-to-understand wording and the content of the items used unambiguous words. Second, the researcher assured respondents of the confidentiality of their responses such that their identity was not required. Third, the researcher emphasized to the respondents that there were no right or wrong answers, which enabled them to answer each question as objectively as possible. Fourth, the instructions were clear and self-explanatory. Fifth, the researcher used multiple items for each construct and ensured clear wording of the items. Finally, the respondents were

provided with detailed and straightforward instructions on how to respond to the questions in the questionnaire.

Besides the procedural remedies employed, statistical methods were also employed after the completion of the data collection. As Podsakoff et al. (2003) suggested, a one-factor test was applied to resolve the presence of common method variance among the constructs. Principal component analyses with varimax rotation was applied to all the items. After running the test, if a single common factor dominates more than 50% of the covariance among the measures, common method bias is indicated. The results from current study revealed that a concern about common method bias did not exist. Specifically, the percentage of variance in current study was 18.585% with the cumulative percentage of 18.585% and a total of 9.850%, which is below the minimum threshold of 50%.

5.9 PLS Path Model Result

In this section, the PLS path model is evaluated using both the measurement model and structural model, which is otherwise known as a two-step process. The adoption of this process in evaluating and reporting the path model is in line with Henseler, Ringle, and Sinkovics (2009). The measurement model, which is popularly known as the outer model, is a structural relationship between latent constructs and their indicators (Tabachnick & Fidell, 2007). The measurement model was assessed using five criteria: 1) indicator reliability, 2) internal consistency reliability, 3) convergent validity, 4) discriminant validity, and 5) model fit evaluation (Hair et al., 2011 & Henseler et al., 2014). The measurement model including the moderator is shown in Figure 5.1.

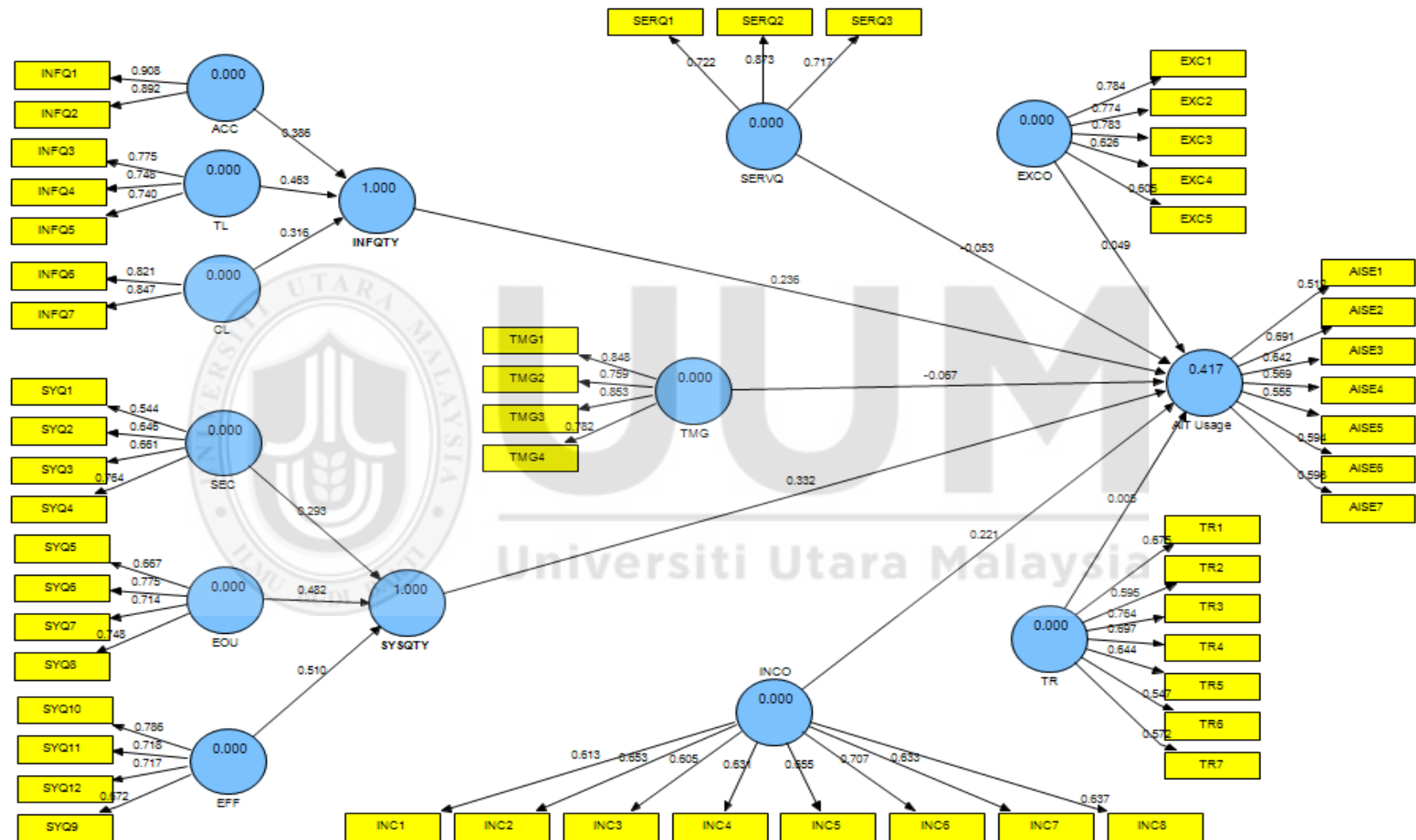


Figure 5.1. Measurement Model of the Latent Constructs.

5.9.1 Indicator Reliability

The outer loadings of each latent construct are used to assess the reliability of the indicators (Hair et al., 2013). Conventionally, for the indicator to be reliable, the item loading should be greater than .70 (Hair et al., 2011). However, Hair et al. (2013) claimed that an indicator with the loading of .4 could be retained if its deletion would reduce the composite reliability. Specifically, Hair et al. (2011) posited that an indicator with outer loadings between .40 and .70 should be removed from the scale if its deletion will lead to an increase in the composite reliability and average variance explained. Thus, based on the criteria given by Hair et al. (2011) and Hair et al. (2013), of a total 53 items, the study was left with 40 items, after deleting 13 items, due to either the need to improve the composite reliability or loadings. Table 5.18 presents the entire retained items and their respective loadings results.

5.9.2 Internal Consistency Reliability

Internal consistency reliability measures how well the indicators work together in measuring a construct. Usually, the internal consistency reliability is assessed based on Cronbach's alpha (Cronbach, 1951). Nonetheless, most PLS path model modeling authors believe that composite reliability is a more robust measure of assessing internal consistency than Cronbach's alpha (Hair et al., 2011; 2013). Therefore, this study used composite reliability. On the criteria for assessing internal consistency reliability using composite reliability, Hair et al. (2011) recommends, based on Nunnally and Bernstein (1994), that the composite reliability should be .60 for exploratory research and .70 for confirmatory research. Table 5.18 presents the results of internal consistency reliability.

5.9.3 Convergent Validity

Convergent validity measures the extent of agreement among multiple items measuring a particular concept (Hair et al., 2014). The most commonly used measure of convergence validity is the Average Variance Extracted (AVE), with a minimum threshold of .5 (Hair et al., 2011; Hair et al., 2013). The result presented in Table 5.18 reveals that AVE values of all the constructs have either met or exceeded the minimum threshold.

Table 5.18
Indicators Loadings, Composite Reliability, and Average Variance Extracted of Latent Constructs

Latent Variable/Indicator	Standardized Loadings	Composite Reliability	Average Variance Extracted (AVE)
Accounting Technology Usage		.778	.540
AITU2	.773		
AITU3	.698		
AITU7	.731		
System Quality-Security		.766	.525
SYSQ2	.617		
SYSQ3	.727		
SYSQ4	.816		
System Quality-Ease of Use		.817	.529
SYSQ5	.666		
SYSQ6	.774		
SYSQ7	.715		
SYSQ8	.748		
System Quality-Efficiency		.815	.525
SYSQ10	.788		
SYSQ11	.718		
SYSQ12	.718		

Table 5.18 (continued)

Latent Variable/Indicator	Standardized Loadings	Composite Reliability	Average Variance Extracted (AVE)
Information Quality-Accuracy		.895	.810
INFQ1	.909		
INFQ2	.891		
Information Quality-Timeliness		.799	.569
INFQ3	.775		
INFQ4	.748		
INFQ5	.740		
Information Quality-Completeness		.821	.696
INFQ6	.822		
INFQ7	.846		
Service Quality		.812	.592
SERQ1	.758		
SERQ2	.860		
SERQ3	.679		
Internal Control Quality		.816	.525
INCO4	.744		
INCO5	.741		
INCO6	.716		
INCO7	.697		
Training		.835	.560
TR1	.767		
TR3	.787		
TR4	.715		
TR5	.722		
Top Management Support		.886	.660
TMG1	.840		
TMG2	.780		
TMG3	.851		
TMG4	.775		

Table 5.18 (continued)

Latent Variable/Indicator	Standardized Loadings	Composite Reliability	Average Variance Extracted (AVE)
External Consultant Involvement		.842	.518
EXCO1	.774		
EXCO2	.763		
EXCO3	.777		
EXCO4	.655		
EXCO5	.623		

The composite reliability of all the latent constructs is displayed in Table 5.18. The values ranged from .617 to .909, which exceeded the minimum threshold of .60 for exploratory research, confirming that all the latent constructs had strong internal consistency. Average variance extracted values ranged from .503 to .810, which were also above the minimum threshold of .50, indicating that the constructs had strong convergence validity.

5.9.4 Discriminant Validity

This is the extent to which a particular latent construct differentiates itself from other constructs (Hair et al., 2014). This implies that, for the latent construct to achieve discriminant validity, the construct must share more variance with its assigned indicators compared with any other latent construct in the model (Hair et al., 2011). The Fornell-Larker criteria is the most common method used for evaluating a construct's discriminant validity. This method requires that, for a construct to achieved discriminant validity, the square root of AVE value for each construct should be greater than the value of the latent constructs (Fornell & Larcker, 1981; Hair et al.,

2011). Therefore, based on Fornell and Larker's (1981) approach Table 5.19 shows the computation of discriminant validity, which demonstrate that the measurement model of this study has achieved good discriminant validity.



Table 5.19

Discriminant Validity

	ACC	AITU	CL	EFF	EOU	EXCO	INCO	SEC	SERVQ	TL	TMS	TR
ACC	.900											
AIT Usage	.336	.735										
CL	.463	.375	.834									
EFF	.345	.457	.372	.724								
EOU	.302	.366	.440	.499	.727							
EXCO	.252	.308	.353	.352	.369	.720						
INCO	.480	.419	.448	.350	.362	.361	.725					
SEC	.317	.223	.338	.293	.295	.203	.438	.725				
SERVQ	.332	.190	.312	.224	.262	.275	.462	.315	.762			
TL	.675	.468	.627	.418	.444	.376	.463	.234	.408	.754		
TMS	.209	.225	.304	.261	.179	.342	.333	.409	.142	.231	.812	
TR	.426	.371	.469	.384	.404	.460	.451	.213	.283	.523	.313	.748

Note: ACC = Accuracy; TL = Timeliness; CL = Completeness; INFQ = Information Quality; SEC = Security; EOU = Ease of Use; EFF = Efficiency; SYSQ = System Quality; SERVQ = Service Quality; EXCO = External Consultant Involvement, INCO = Internal Control, TMS = Top Management Support, TR = Training and AISU = Accounting Information Technology Usage.

5.10 Model Fit Evaluation

Conventionally, no global goodness-of-fit criterion exists for PLS path modeling (Hair et al., 2013). However, Henseler et al. (2014) claimed that reliable measures for evaluating model fit exists for PLS Path Modeling, which is known as exact fit or goodness of fit (GoF). They further stated that GoF is not a global fit measure, but rather a measure of how well the hypothesized model fits the use of a study. Therefore, this study used Gof to measure to determine how well the hypothesized research model fits the data used. The GoF is computed as the geometric mean of the average commonality of the outer measurement model and the average R-square of endogenous latent variable (Tenenhaus, Amato, & Esposito-Vinzi, 2004). The formula for calculating GoF is:


$$\text{GoF} = \sqrt{R^2} \times \text{Average Communalities (AVE)}$$

Tenenhaus et al. (2004) recommended that the closer GoF is to 1, the better the data fit the hypothesized model. Accordingly, Wetzels, Odekerken_Schroder, and Van Oppen (2009) classified the values of GoF as .10 as small, .25 as medium and .36 as large. Table 5.20 presents the GoF of this study.

Table 5.20
Goodness of Fit (GoF)

Goodness of Fit	Communality	R Square
Accuracy	.810	
AIT Usage	.540	
Completeness	.696	
Efficiency	.525	
Ease of Use	.529	
External Consultant Involvement	.518	.319
Internal Control Quality	.525	
Security	.525	
Service Quality	.581	
Timeliness	.569	
Top Management Support	.660	
Training	.560	
Geometric Mean	.583	.319

$$\text{GoF} = \sqrt{.583 \times .319}$$

$$\text{GoF} = .431$$

Therefore, based on the criteria given by Wezels et al. (2009), the GoF of this study is large with a value of .43, indicating a strong fitness of the hypothesized model for the data used in this study.

5.11 PLS Structural Model Results

Following the successful evaluation of the measurement model, which is a pre-requisite for successive analyses in PLS, the structural model was also evaluated. This section describes the method and criteria that were used in assessing the structural model. Standard bootstrapping procedure with 5,000 bootstrapped samples and 257 cases was used in assessing the significance of path coefficients of the structural model (Hair et al., 2013). The evaluation of the structural model was performed in five stages, which are explained in the following sections.

5.11.1 Evaluation of the Significance of Path Coefficients

The significance and relevance of PLS-SEM structural model were evaluated based on the t-statistics and p-values obtained using 5,000 bootstrapped samples (Hair et al., 2011). Figure 5.2 and Table 5.21 present the statistical estimates of the path coefficients of the structural model.



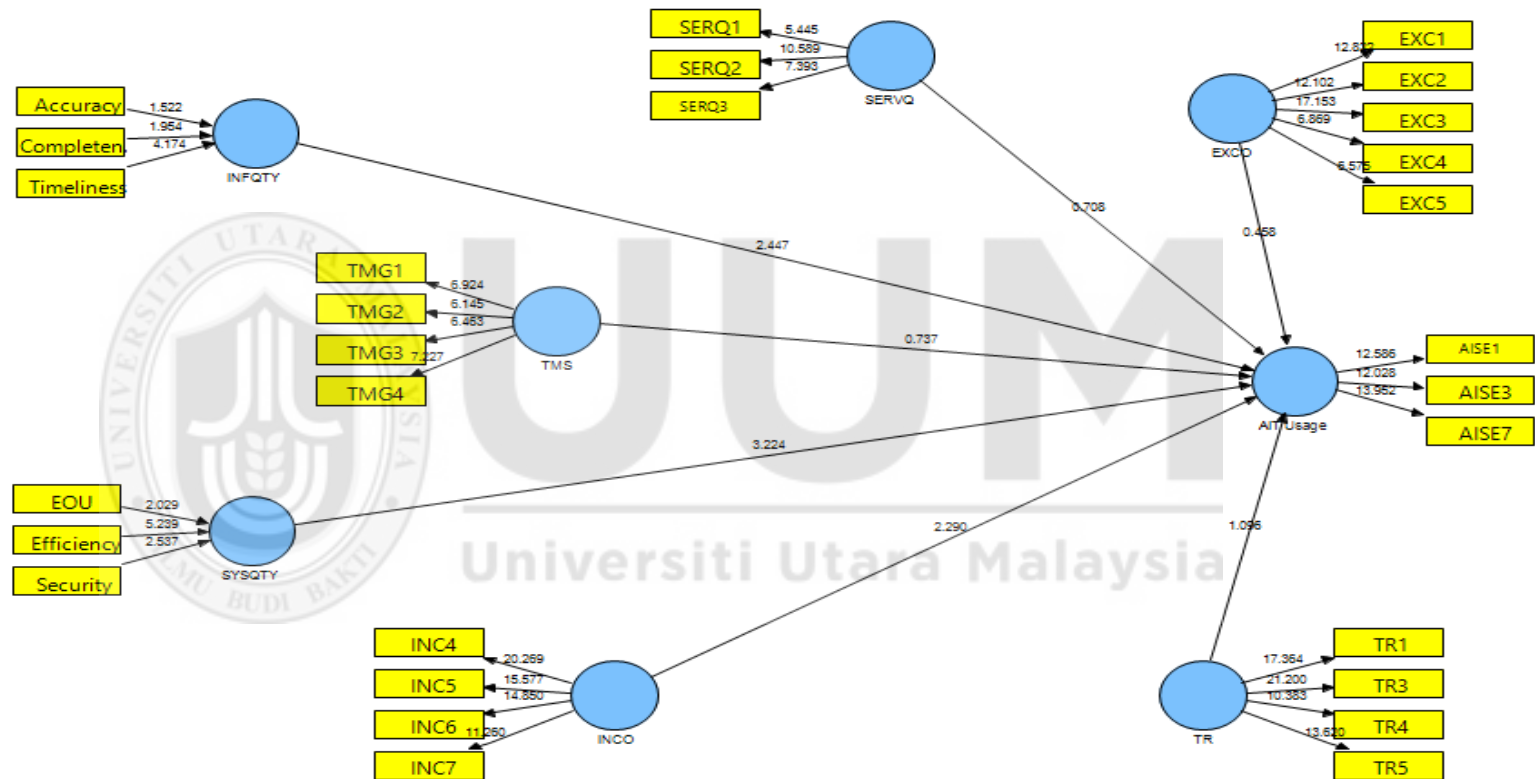


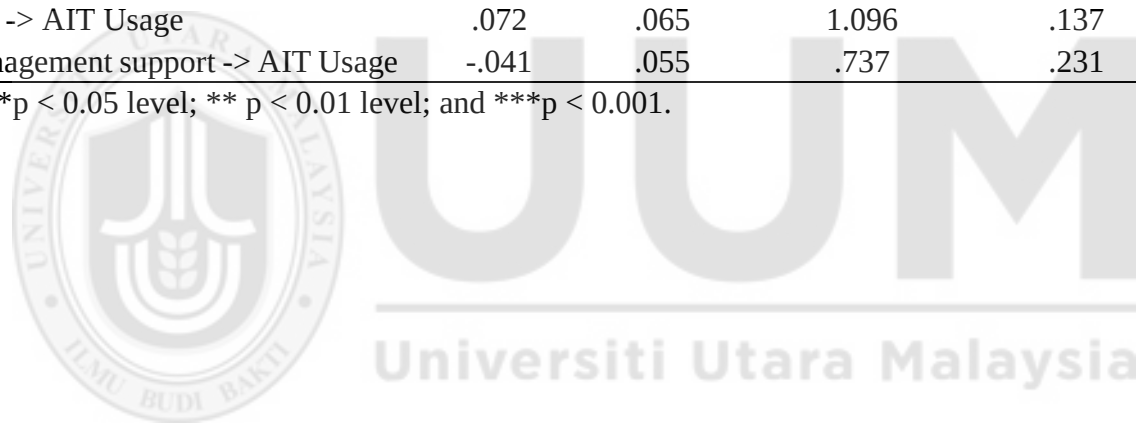
Figure 5.2. Structural Model of the Direct Effect.

Table 5.21

Structural Model Evaluation – Direct Effect

Hypothesis	Relationship	Beta	S E	t-statistics	p value	Findings
H1	System Quality -> AIT Usage	.227	.070	3.224	.001***	Supported
H2	Information Quality -> AIT Usage	.220	.091	2.447	.008***	Supported
H3	Service Quality -> AIT Usage	-.040	.057	.708	.240	Not Supported
H4	Internal Control Quality -> AIT Usage	.175	.077	2.290	.011**	Supported
H5	Training -> AIT Usage	.072	.065	1.096	.137	Not Supported
H6	Top Management support -> AIT Usage	-.041	.055	.737	.231	Not Supported

Note: Significant at the *p < 0.05 level; ** p < 0.01 level; and ***p < 0.001.



There are nine hypotheses in this study as stated in the literature review chapter; six (6) direct and three (3) indirect hypotheses. A statistical value that is substantially different from 0 is said to be statistically significant, but, this depends on the directionality of the hypothesis, the degrees of freedom and the confidence level. Thus, the p-value is applied to ascertain if the paths are significant (Hair et al., 2014).

The result of the direct hypothesis testing is presented in Figure 5.2 and Table 5.21. H1 System Quality – Accounting Information Technology Usage was postulated to have a significant and positive relationship, this hypothesis was supported ($\beta = .227$, $t = 3.224$, $p = .001$). H2 hypothesized that Information Quality would have a significant and positive relationship with Accounting Information Technology Usage this hypothesis was supported ($\beta = .220$, $t = 2.447$, $p = .008$). However, H3 hypothesized that Service Quality and Accounting Information Technology Usage would have a significant and positive relationship; this hypothesis was not supported ($\beta = -.040$, $t = .708$, $p = .240$). H4 Internal Control Quality – Accounting Information Technology Usage path, which forms the extension of DeLone and McLean model in this study, postulated a significant and positive relationship. The results in Figure 5.2 and Table 5.21 supported this hypothesis ($\beta = .175$, $t = 2.290$, $p = .011$).

Furthermore, H5 hypothesized that Training would have a significant and positive relationship with Accounting Information Technology Usage, and the result revealed the influence was positive but insignificant ($\beta = .072$, $t = 1.096$, $p = .137$). H6 hypothesized that Top Management Support would have a significant and positive

relationship with Accounting Information Technology Usage. However, the results indicated the influence was positive but not significant ($\beta = -.041$, $t = .737$, $p = .231$).

5.11.2 Evaluation of Coefficient of Determination (R^2)

The coefficient of determination or R^2 is an important criterion used in evaluating the quality of structural model in PLS path modeling (Hair et al., 2011). R^2 is the variance explained in the endogenous latent variable by one or more exogenous latent variables (Henseler et al., 2009). Three different evaluation criteria were recommended in the literature. Falk and Miller (1992) claimed R^2 that is more than 1.5% is considered as satisfactory. Whereas Hair et al. (2011) deemed that R^2 values of .25, .50, and .75 could be described as weak, moderate and substantial respectively. On the other hand, Chin (1998) identified R^2 values as weak (.02 to .19), moderate (.13 to .33) and substantial (.26 to .67). For this study, the R^2 was .320, which implies that the predictor variables explained 32% of the variance in accounting information technology usage in the banking sector, while other factors not included in the model explained the remaining 68%. Looking at this value, the model is satisfactory based on Falk and Miller (1992) and yet moderate according to Chin and Hair (2011).

5.11.3 Evaluation of Effect Sizes of Exogenous Variables (f^2)

The structural model can also be evaluated using effect size. Effect size is described as the specific change in R^2 of the endogenous variable caused by particular exogenous construct(s) (Chin 1998; Hair et al., 2011). Following the suggestions by Chin (1998) and Hair et al. (2011), the effect size (f^2) for multiple regression is calculated as;

$$\text{Effect size } (f^2) = \frac{R^2_{Included} - R^2_{Excluded}}{1 - R^2_{Included}}$$

Effect size is evaluated as weak (.02), moderate (.13), and strong (.35) according to Cohen (1988). Table 5.22 presents the effect sizes of exogenous variables on the R^2 of the endogenous latent variable.

Table 5.22
Effect Size (f^2)

R-squared	Included	Excluded	f-squared	Effect Size
System Quality	.320	.276	.065	Small
Information Quality	.320	.298	.032	Small
Service Quality	.320	.313	.010	Very Small
Internal Control Quality	.320	.310	.015	Very Small
Training	.320	.317	.003	None
Top Management Support	.320	.319	.001	None

The results of the effect size are presented in Table 5.22. The f -squared of system quality, information quality, service quality, internal control quality, training, and top management support were .065, .032, .010, .015, .003 and .001 respectively. Therefore, the effect size of this study ranged from small to none in line with the classification given by Cohen (1988). However, Chin et al. (2003) argued that even a small effect size should not be neglected because even a small interaction effect can be meaningful under extreme moderating conditions. Furthermore, effect size might also vary based on the sample size of a study when the sample or number of respondents is small no effect size may be insignificant. However, when the sample size is large, or the number of the respondents is large then no value may be considered significant (Sekaran & Bougie, 2014).

5.11.4 Evaluation of Predictive relevance (Q^2)

The blindfolding procedure allows re-estimation of the model, as each point of the data cases is being omitted (Chin, 1998; Henseler et al., 2009). One of the most commonly used approaches for computing predictive relevance is the Stone-Geisser test using a blindfolding procedure (Geisser, 1974; Stone, 1974). It is an auxiliary approach for evaluating goodness-of-fit in PLS-SEM (Duarte & Raposo, 2010). This procedure is done only in a study that has an endogenous latent variable with reflective measures in the model, and it is evaluated as having predictive relevance if the Q^2 value of the endogenous latent constructs is greater than 0 (Hair et al. 2014).

While, Chin (1998) opined that research models with Q^2 of .02, .15, and .35 have small, medium and large predictive relevance respectively. Therefore, because the endogenous latent variables in this study had reflective measures, the Stone-Geisser test of predictive relevance was applied. The Q^2 value of the study was calculated via a blindfolding procedure and cross-validated redundancy. Table 5.23 presents the predictive relevance of the Q^2 of this research model.

Table 5.23
Model Predictive Relevance

	SSO	SSE	1-SSE/SSO
Accounting Information Technology	771	662.859	.140

As depicted in Table 5.23, the Q^2 value is .140, which indicates substantial evidence that the exogenous variables in this study have predictive relevance to the endogenous latent variable (Hair et al., 2011). Following Chin's (1998) criteria, with a Q^2 greater

than zero, the predictive relevance of the exogenous latent variables on endogenous latent construct was classified as medium in the current study.

5.11.5 Testing the Moderation Effect

There are four main methods used in testing the moderation (interaction) effect in PLS path modeling (Henseler & Chin, 2010). These include the product indicator method (Chin, Marcolin, & Newsted, 2003), a two-stage method (Chin et al., 2003), a hybrid method (Wold, 1982), and the orthogonal method (Little, Bovaird, & Widaman, 2006). The orthogonal approach is recommended for a study that is aimed at predicting a relationship between exogenous and endogenous constructs (Henseler & Chin, 2010). However, when the moderator is formative, the two-stage method is the most suitable approach (Chin et al., 2003; Henseler & Chin, 2010). Following Henseler and Chin (2010), the current study used the orthogonal approach in testing the moderator. In evaluating the moderating effect of this study, Cohen's (1988) approach for evaluating effect size was applied. Figure 5.4 and Table 5.24 present the moderation effect using the orthogonal approach.

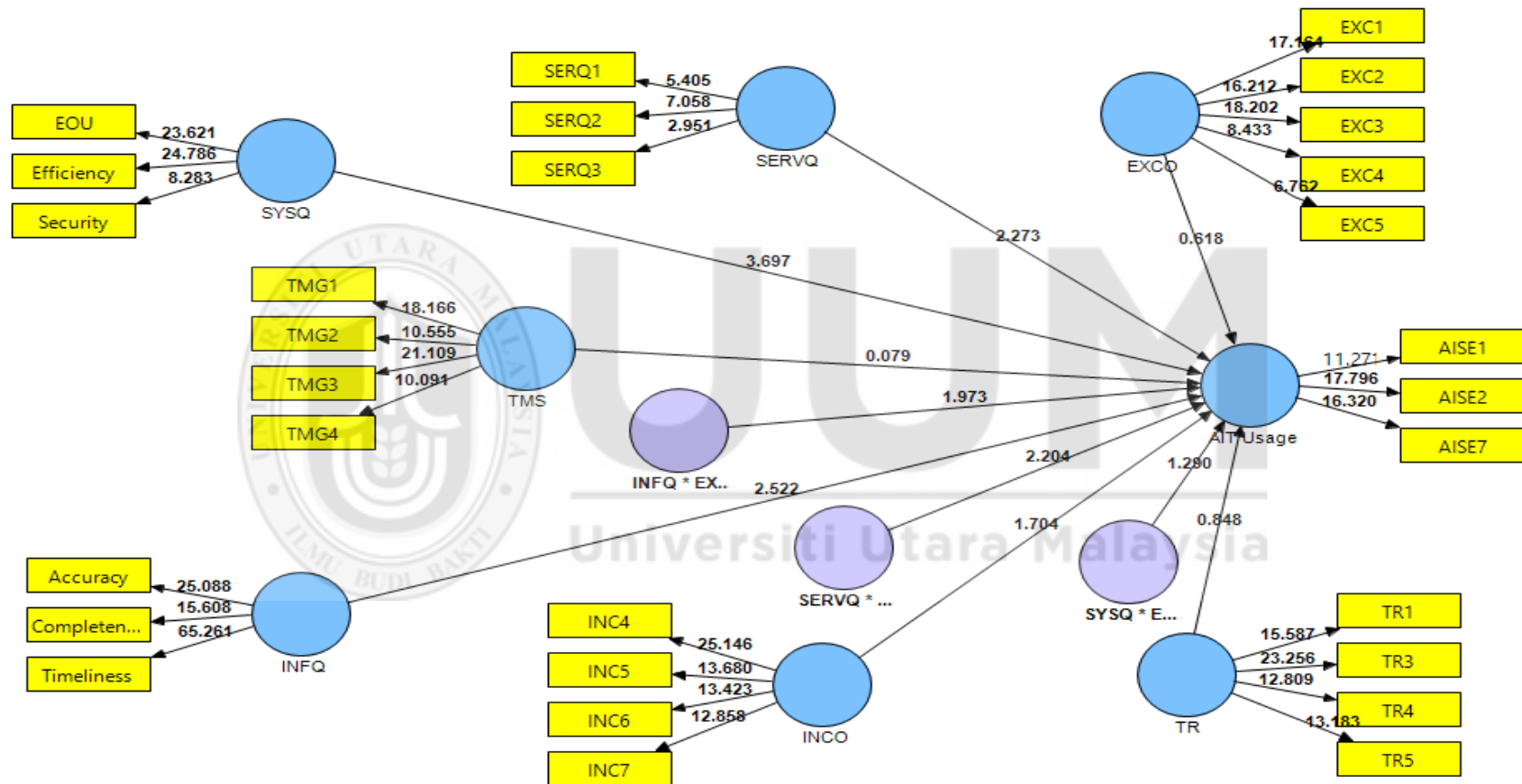


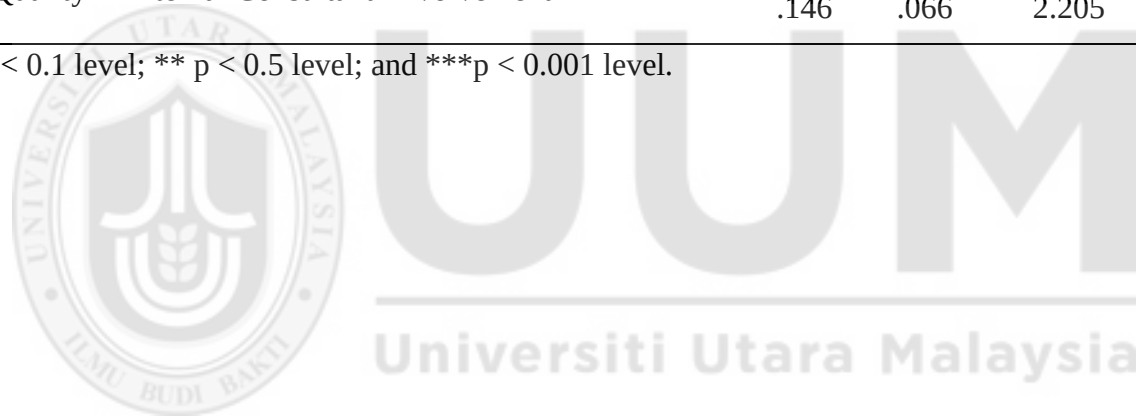
Figure 5.3. Structural Model for Indirect Effect.

Table 5.24

Structural Model Evaluation – Indirect Effect

Hypothesis	Relationship	Beta	S E	t statistics	p value	Findings
H8	System Quality * External Consultant Involvement -> AIT Usage	.153	.119	1.290	.099*	Supported
H9	Information Quality * External Consultant Involvement -> AIT Usage	.192	.097	1.973	.025**	Supported
H10	Service Quality * External Consultant Involvement -> AIT Usage	.146	.066	2.205	.014***	Supported

Note: Significant at: *p < 0.1 level; ** p < 0.5 level; and ***p < 0.001 level.



This study hypothesized that external consultant involvement would moderate the relationship between system quality and accounting information technology usage. The expectation was that the relationship between system quality and AIT usage would be stronger for banks with a more effective external consultant than banks with a less effective external consultant. As hypothesized, the results in Table 5.24 presented that the moderation effect of system quality and external consultant ($\beta = .153$, $t = 1.290$, $p = .099$) were positive and significant. Therefore, H8 of the current study was marginally supported. The information of the path coefficients for the moderation effect external consultant involvement on the relationship between system quality and accounting information technology usage was subsequently plotted in a graph following the recommendation of Dawson (2014). In support of this, Heyes (2013) argued that visual presentation of interacting effect can be an excellent way of interpreting moderation. Hence, Lowry and Gaskin's (2014) template for visualizing moderation effect was adopted. Figure 5.5 presents the interaction effect.

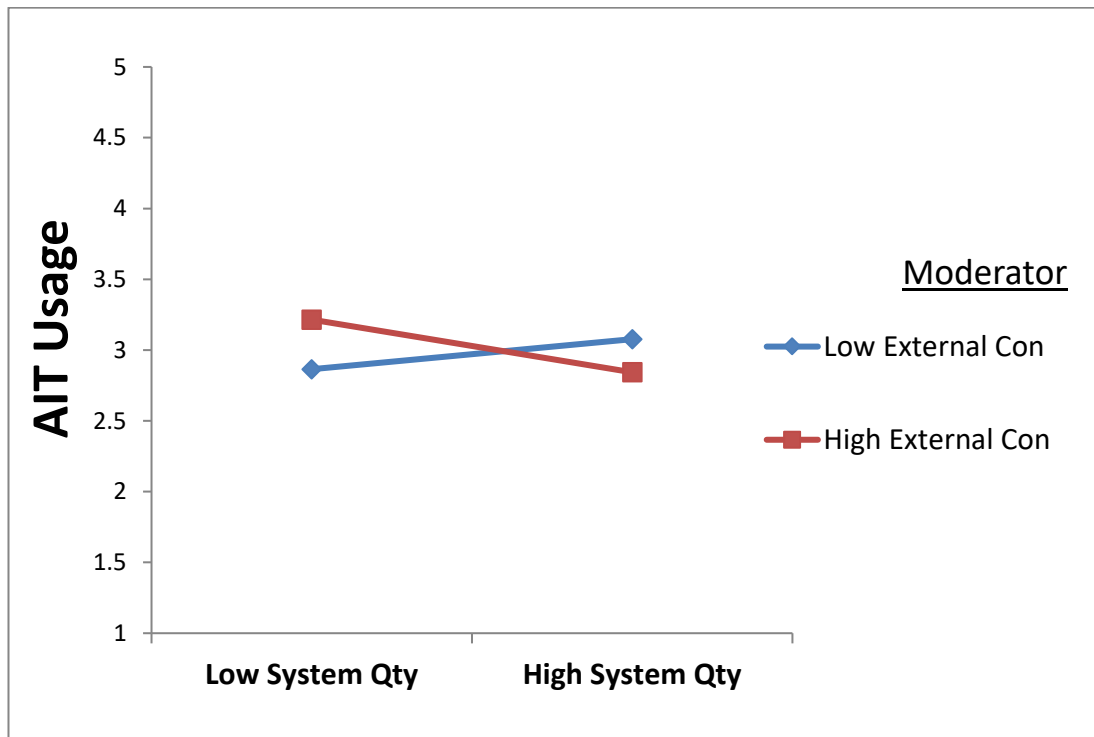


Figure 5.5. Interaction Effect of System Quality and External Consultant Involvement on Accounting Information Technology Usage.

Hypothesis (H9) stated that external consultant involvement would moderate the relationship between information quality and AIT usage. Specifically, the study posited that the influence between information quality and AIT usage would be stronger for banks with a more effective external consultant than banks with a less effective external consultant. As hypothesized, the results in Table 5.24 show that the moderation effect of information quality and external consultant was significant at $p < .05$. Thus, the hypothesis was supported ($\beta = .192$, $t = 1.973$, $p = .025$). Following Dawson (2014) recommendation, Figure 5.6 showed the graphical interaction effect.

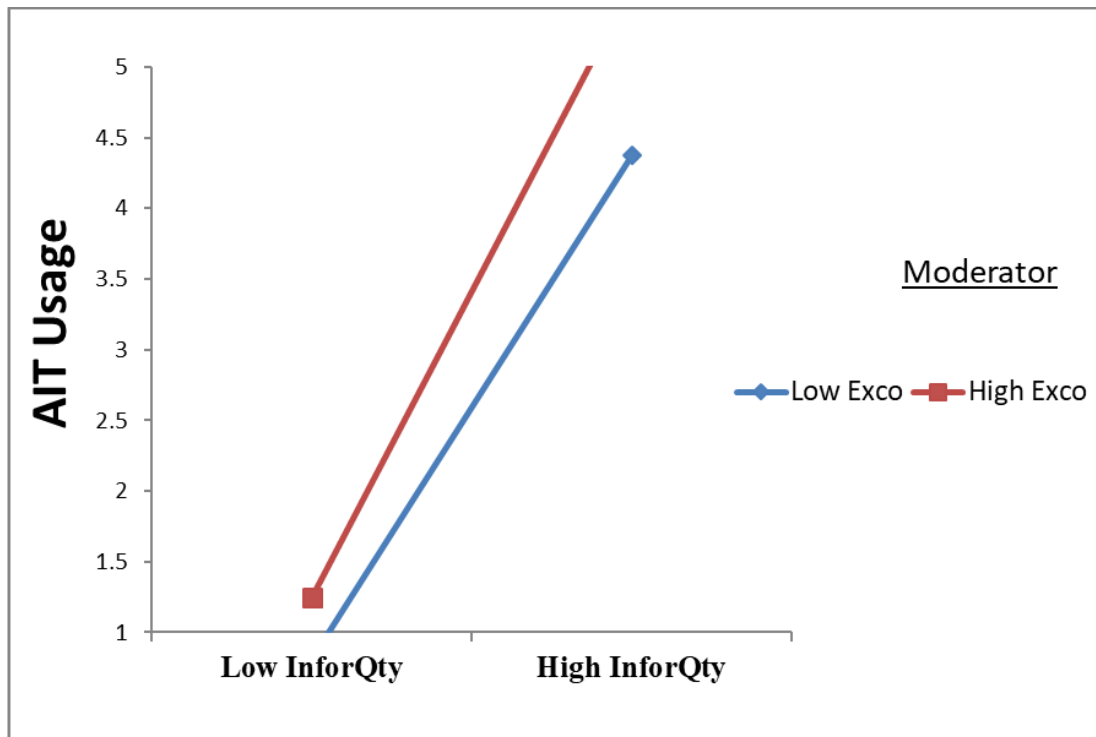


Figure 5.6. Interaction Effect of Information Quality and External Consultant Involvement on Accounting Information Technology Usage.

Furthermore, from the results of Figure 5.4 and Table 5.24 Hypothesis (H10), which posited that external consultant involvement would moderate the relationship between service quality and AIT usage, was also supported ($\beta = .146$, $t = 2.205$, $p = .014$). The expectation was that the influence between service quality and AIT usage would be stronger for banks with a more effective external consultant than banks with a less effective external consultant. The interaction effect is presented in Figure 5.7.

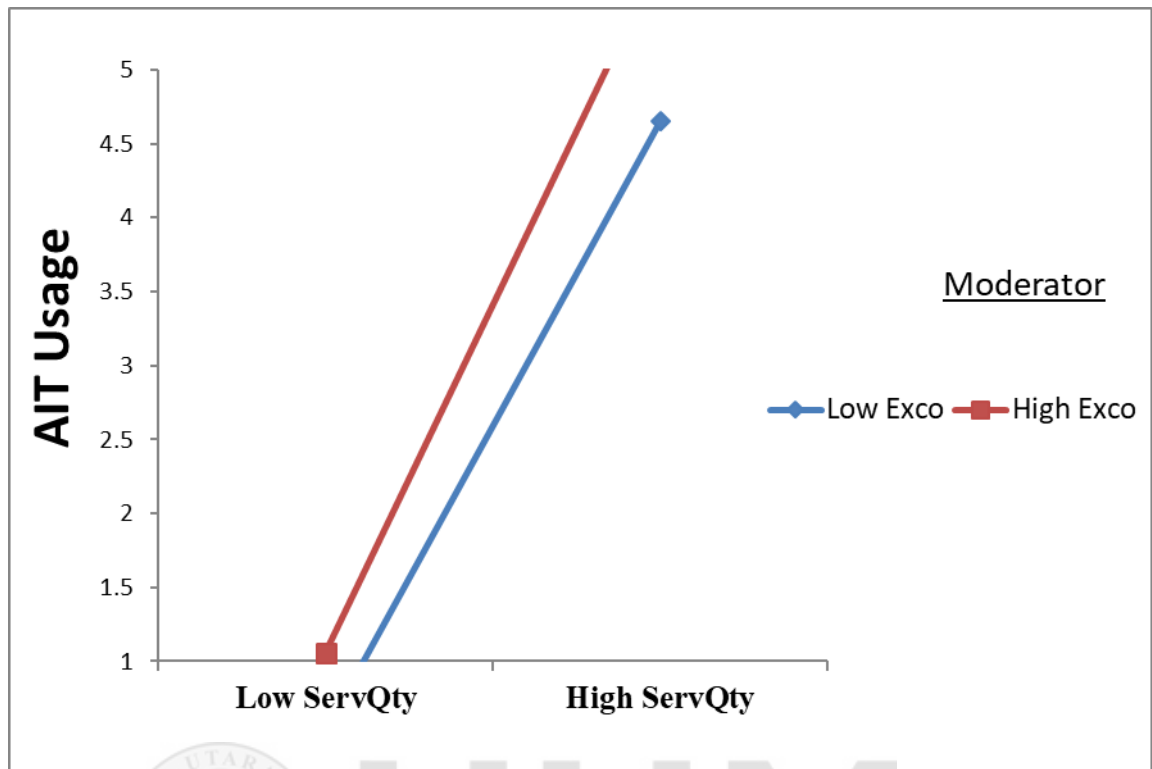


Figure 5.7. Interaction Effect of Service Quality and External Consultant Involvement on Accounting Information Technology Usage.

5.11.6 Determination of the effect Size (f^2) of the Moderator

Further computation was carried out to estimate the effect size of the moderator. Henseler and Fassott (2010) argued that the effect size of a moderator can be calculated by comparing R^2 value of the main effect model against the R^2 value of the overall model that incorporate both direct and indirect effects. Therefore, following Cohen's (1988) and Henseler and Fassott's (2010) guidelines, the effect size of the moderator was computed using the formula below:

$$\text{Effect Size } (f^2) = \frac{R^2 \text{ of the model with moderation effect} - R^2 \text{ of the model without moderation effect}}{1 - R^2 \text{ of the model with moderation effect}}$$

$$1 - R^2 \text{ of the model with moderation effect}$$

The threshold for estimating the effect size of the moderator are: weak (.02), moderate (.15), and strong (.35) (Cohen, 1988; Henseler & Fassott, 2010). Based on this guideline, the result of the effect size is presented in Table 5.25.

Table 5.25
Effect Size of the Moderator

Endogenous Variables	R – Squared			
	Included	Excluded	<i>f</i>-squared	Effect Size
External Consultant Involvement	.351	.320	.048	Small

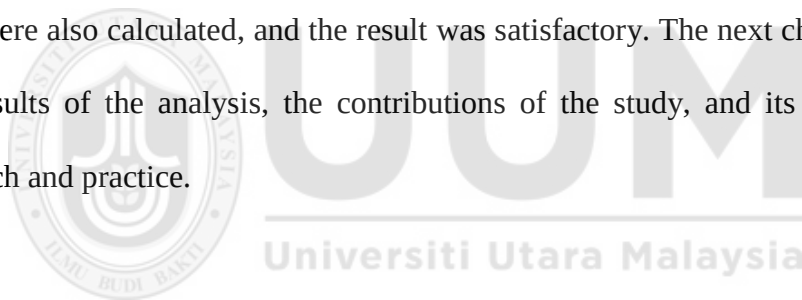
Table 5.25 shows that the f^2 of the moderator was .048. Following Cohen (1988) and Henseler and Fassott (2010), the moderating effect has a small effect size. The effect size is, although small, nonetheless important considering Chin et al. (2003)'s assertion.

5.12 Summary

This chapter discussed the procedures and the results of the data analysis. The chapter started with data preparation and screening, where data was subjected to coding and imputation in SPSS software. Then, the data were screened for entry errors, after which a few entry errors were detected and corrected. After that, the data were checked for missing values. Moreover, it was found that the missing values had no specific pattern (MCAR) and were less than 5%. Hence, they were treated using mean replacement as Kumar, Talib, and Ramayah (2013) suggested. Further analysis was conducted to determine outliers, normality, and multicollinearity of the data using Mahalanobis distance, skewness, and kurtosis as well as the variance inflated factor.

The data demonstrated a normal distribution, and no issues of high correlation were present among the exogenous constructs in the model. Subsequently, descriptive statistics were used to determine the characteristics of the demographic variables.

A PLS path model was used to assess the path coefficients, and results of both direct and moderating effect were presented. Four of the six direct hypotheses of the study were accepted, whereas two were rejected. For indirect hypotheses, all the three path coefficients revealed a significant and positive relationship and thus were accepted. In addition, the model of the study was assessed by the value of the coefficient of determination (R^2), and the effect size (f^2), model predictive relevance and effect size (Q^2) were also calculated, and the result was satisfactory. The next chapter discussed the results of the analysis, the contributions of the study, and its implication for research and practice.



CHAPTER SIX

DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH

6.1 Introduction

In this chapter, a detailed discussion on the determinants under study are presented. The findings in Chapter Five in relationship to the previous studies and the underpinning theories on AIT usage are discussed. The chapter further discusses the results of direct and indirect (moderating) hypotheses testing. The research objectives are reviewed to assess whether they have been achieved. Then a discussion on the theoretical, methodological and practical implications of the study are presented. Lastly, the limitations and suggestions for future studies are discussed.

6.2 Determinants of Accounting Information Technology

Based on extensive literature review and consideration of the context of this study, six direct determinants of AIT usage were hypothesized. Three of the determinants were adapted from the DeLone and McLean model; System Quality, Information Quality, and Service Quality, whereas Internal Control Quality, Training and Top Management Support were added to the DeLone and McLean model as an extension to the model. All these determinants were proposed to have a significant and positive relationship with AIT usage. With respect to the results for the direct relationship of the structural model, three of the hypotheses (system quality, information quality, and internal control quality) revealed a significant and positive relationship with AIT usage whereas service quality, training and top management support revealed an

insignificant relationship with AIT usage. The following discussion compares the results of the current study with respect to the results of previous studies.

6.2.1 System Quality

System Quality is defined in the context of current study as the degree of technical efficiency of the system, in terms of user interface consistency, ease of use, documentation quality, programming error and maintainability of the system. The system quality was operationalized as second-order formative construct. Therefore, a hypothesis was put forward and tested; it was posited that the relationship between system quality and AIT usage would be positive and significant. The result indicated that system quality has a significant and positive relationship with AIT usage. The findings substantiate previous studies that have examined a similar relationship. For example, Shatat et al.'s (2013) study revealed a positive relationship between system quality and BI technology usage. Also, consistent with this study, Balasubramanian et al. (2014) found a significant relationship between system quality and bank AIT usage. Interestingly, these studies share contextual similarities considering that both AIT and BI are new technologies that come with the potential to improve the operational efficiency and effectiveness of the banks.

Furthermore, the first-order constructs of system quality results indicated that system security, ease of use, and efficiency are core antecedents that are used to evaluate system quality. The quality of the system depends on these three important characteristics: 1) security, 2) ease of use, and 3) efficiency (Chang et al., 2012). The

results of current study implied that a system should have adequate security that would prevent unauthorized access and prevent a virus attack. In addition to security features, when the system user(s) developed a positive attitude on the dimension of ease of use, this attitude or perception would motivate the user to utilize and manage the system effectively thereby reducing the problem of underutilization and technology maintenance problem, thus leading to the achievement of the expected benefits of the technology. In support of this finding, Nelson et al. (2005) stated that a system that is perceived to be easy to use is also perceived to have high quality. Therefore, ease of use is an important antecedent of system quality. Beyond ease of use, system quality can also be influenced by efficiency. The system should have a high processing speed that can improve the user(s) work efficiency. By implication, a user's perception of system efficiency would have a positive effect on the operational efficiency of the banks, hence, leading to decreased products cost and retention of bank customers (Gorla et al., 2010).

In the same manner, system quality was also found to have a positive and significant relationship with AIT usage in studies by Yan et al. (2010) and Ching-Sheng et al. (2012). The findings of the current study concurred with the result of the investigation of the relationship between system quality and IS usage in Lac Hong University (Hien et al., 2014). The result is also in line with Ming-Lang et al.'s (2011) findings about Taiwan University. However, the context might differ with respect to the subject of the studies (Managers and IT vs. students), and the countries in which the studies were conducted. Therefore, the result of the current study further confirmed that system

quality is an important determinant of AIT usage because the relationship holds for a different context and country.

6.2.2 Information Quality

Information quality is defined in the context of this study as the ability of the technology to provide timely, accurate, and complete information to the user for effective decision making. The information quality was operationalized as a second-order formative construct. Thus, the hypothesis was formulated based on the previous studies. The hypothesis stated that information quality would have a significant and positive relationship with AIT usage. Based on the statistical evidence from the previous chapter, this hypothesis was supported.

The finding in the current study is consistent with past studies that investigated a similar relationship (e.g., Nicolaou, 2000; Nelson et al., 2005; Gorla et al., 2010). Their study's findings indicated a significant and positive relationship between information quality and AIT usage. Furthermore, the finding of the current study implied that all the first-order constructs of accuracy, timeliness, and completeness of the output (information quality) produced by the technology are important dimensions that influence information quality based on the perspectives of the respondents (Regional/Branch Managers and Account Managers of the banks).

The finding suggests that information produced should be correct, unambiguous, and meaningful to the user(s). The information should also be provided at the right time

for the right user for an effective decision-making process. Information not only must be accurate and timely but also must be complete because incomplete information may result in incorrect and untimely decision-making to the management. This finding further suggests that employees at the operational level bank who are the users of the technology will be satisfied, decision making will be enhanced at the tactical level, and the speedy execution of bank strategies at the strategic level will also be improved. In line with current study findings, Saha et al. (2012) found that accuracy, timeliness, and completeness were the most important features of information quality. Thus, the significance of information quality dimension suggests that accuracy, timeliness and completeness are important first- order constructs for good information.

Moreover, in the context of e-government Al-Kasswina (2012) found that information quality has a significant relationship with e-government AIT. These findings were further substantiated in the context of Jordanian banks by Shatat et al. (2013), who found a positive relationship between information quality and IT in banks. Also, consistent with the above studies' results in Ikem et al. (2014), Ige and Odetayo (2014) found a positive relationship between information quality and bank AIT usage. Findings similarities in the above studies are not unexpected because they share the same contextual similarities with this current study. Therefore, the findings of the current study clearly indicated that information quality is also a key determinant of AIT usage. Thus, good information provided by a system can enable banks to realize the expected benefits of their investments.

6.2.3 Service Quality

Based on the definition of this construct in the current study, service quality refers to the degree of responsiveness, assurance, and empathy of the bank IT unit that support the efficient operation of the systems that results in AIT usage of banks. A hypothesis was formulated after literature review. The hypothesis stated that service quality would have a significant and positive relationship with AIT usage. Based on the statistical evidence presented in the previous chapter, this hypothesis was not supported, implying a insignificant relationship between service quality and AIT usage. The result of the current study is consistent with previous study that has examined a similar relationship. For instance, Negash et al. (2003) found no significant relationship between service quality and IS usage.

One likely reason for why service quality has an insignificant relationship with AIT usage in the current study might be the attitudes of the user(s) toward the technology. When they perceived the quality of service provided by the staff of the IT unit or overall support delivered were below their expectations such as unresponsiveness to user(s) complaints or unprofessional manners in dealing with user(s), they felt so. Thus, user(s) considered service quality as a less sensitive issue in determining technology usage. This is possible especially when other important drivers of AIT usage such as system quality and information quality function effectively.

In this situation, a temporary disruption of service cannot stop them from carrying out their transactions successfully, as such user(s) are less concerned about the quality of

service. Similarly, DeLone and McLean (2003) contended that service quality dimensions may have different weights depending on the context of analysis. More recently, Peter et al.'s (2013) study revealed that the service quality dimension had mixed findings. Therefore, based on this finding, users of AIT consider the service provided by the staff of IT unit in terms of assurance, empathy, and responsiveness as less relevant than other determinants in determining AIT usage in the Nigerian banking sector.

6.2.4 Internal Control Quality

Internal control quality is a new construct that forms an extension of the DeLone and McLean model of 2003. This construct is defined in the context of the current study as the mechanisms adopted by the banks to safeguard and evaluate the accuracy and reliability of its accounting information technology that ensures the operational efficiency of the banks. Thus, a hypothesis was formulated. The hypothesis regarding this relationship stated that there would be a significant and positive relationship between internal control quality and AIT usage. The hypothesis was tested, and the result confirmed that the stated relationship exists. Therefore, the higher the internal control quality, the higher the usage of the technology in the banks. This finding gives credence to the argument that internal control quality is an important management tool that is used to safeguard bank assets and to control operational activities to achieve efficiency in their operations.

Although an inadequate number of empirical studies have examined a similar relationship, this is an interesting outcome because it is incongruent with some assumptions in past literature. For instance, based on DeLone and McLean assumptions other important determinants of AIT usage were yet to be explored by past studies. The result of current study confirms this past theoretical assumption. Therefore, having adequate internal control is important in ensuring AIT usage. Supporting this argument, Stefanoul (2012) contended that inadequate internal control affects AIT usage of the organization. Consistent with these assumptions, Abu-Musa (2006) revealed that many organizations are suffering from both internal and external financial losses due to an ineffective internal control system within the organization.

Moreover, this finding supports Acklesh et al. (2013) proposition that a good internal control system reduces financial irregularities in banks and thus increases the likelihood of AIT usage. The qualitative characteristics of AIT could be maintained with an effective internal control system within the organization (Toposh, 2014). Given the intensely competitive nature of the business environment, banks need to have an effective internal control system that enables them to manage risk and monitor their operational activities. The finding suggests that a quality internal control facilitates the achievement of organizational goals, the safeguarding of assets, and ensures the relevance and integrity of data. Hence, this makes certain the accuracy and completeness of the output produced by the technology. Furthermore, the strength of internal control gives management the opportunity to make corrective actions in the event of any control deficiencies and reduce the impact of an unfavourable event. This

is especially salient in Nigerian banks in which increased cases in e-banking and other related financial frauds were reported. Likewise, in the context of Jordanian Banks, Hayale and Abu-Khadra (2006) found that banks that have strong internal control reduce the risk of fraud and error, which, in turn, improves AIT usage in the banks. Based on the above findings, current study provided empirical evidence that internal control quality is an important determinant of AIT usage in the Nigerian banks.

6.2.5 Training

Training is defined as the extent to which employees' skills and knowledge acquisition programs assist them in understanding how important the technology is and how it is related to their work and other functional areas within the organization so as to contribute to AIT usage. Therefore, after a review of the previous studies and careful consideration of the context under study, a hypothesis was formulated which stated that a significant and positive relationship would exist between training and AIT usage. The results of previous studies, for example, Dehghanzade et al. (2011) claimed that adequate training courses for employees would significantly increase AIT usage. Conversely, a lack of training employees regarding the usage of IS such as the AIT will make employees find a means of manipulating the system, and these manipulations eventually may result in the failure of a system (Umble, Haft, & Umble, 2003). To avoid the underutilization or failure of a system, continuous training of the employees is indispensable because it would reduce technical problems resulting from misuse (Ajami & Bertiani, 2012).

Contrary to the current study's hypothesis such a relationship was found to be positive but not significant. This situation perhaps could be because some training was directly related to work while other, more general compulsory training, did not have direct application to real work. Also, a second possible explanation for the insignificant relationship of training construct on AIT usage could be due to the proliferation of IT across the globe. As a result this, today's employee may be more familiar with different types of IS technology such as the AIT thus, requiring less training to operate the system. A third possible reason is that a sizeable number of the respondents believed that most AIT training programs focus on specific tasks. Thus, these programs do not cover the overall training needs of the user(s); such a flawed approach might only assist and prepare AIT users for implementation of specific tasks in the short term.

In line with this finding, Ignatiadis and Nandhakumar (2009) stated that such types of training might be for immediate task completion and often fail to provide the user(s) with sufficient knowledge of how the overall system functions across the organization. Therefore, the inability of the user(s) to adequately understand the AIT might only encourage them to finish their immediate operational activities at the moment without considering the overall effects of their actions on AIT usage. This finding concurs with a previous study by Medina et al. (2013), who found an insignificant relationship between training and AIT usage in a SME-adoption environment in Mexico.

Similarly, the explanation for the insignificant relationship between training and AIT usage in Nigeria could be because previous study has considered training as a dimension or measure under external consultant or top management support (Thong et al., 1994; Dezdar & Ainin, 2010) and not a predictor variable. In closely related findings, Argyropoulou (2011) revealed a statistically weak relationship between training construct and IS effectiveness in organizations. Therefore, users of AIT do not consider training as a direct determinant of AIT usage and may consider training less relevant than other determinants. Thus, the evaluation of this construct would require further research with different measures to assess the influence of training on AIT usage.

6.2.6 Top Management Support

In the context of this study, top management support is defined as the extent to which bank managers provide funds, guidance and all the necessary resources needed before and after the implementation of AIT. After an extensive review of past literature, a hypothesis was formulated thusly, a significant and positive relationship would exist between top management support and AIT usage. This hypothesis was tested. Contrary to what was posited, the result indicated an insignificant relationship between top management support and AIT usage in the context of Nigerian banks.

Although the result of the current study was unexpected, the lack of support for the hypothesized effect of top management support toward AIT usage may be understood in the light of system quality, information quality, and internal control quality, which

either directly or indirectly depend on top management support. Nonetheless, this finding of the current study is not in isolation from previous studies. For example, Thong et al.'s (1996) empirical finding revealed no significant relationship between top management support and IS usage.

A possible explanation of this study's finding can be seen from the demographic profile of the respondents given that account managers of the banks comprised a significant proportion of the respondents. They might perceive IT unit staff as more important in providing the needed support. For instance, when bank employees have problems in relationship to AIT usage, they normally report them to them to the IT unit which they believe to have adequate knowledge and experience in handling AIT-related issues. Consistent with this argument, Ein-Dor et al.'s (1984) study show no relationship between top management supports (in terms of financial resources) and IS usage.

Similarly, Thong et al. (1996) claimed that top management are only involved in AIT project approval but do not participate in AIT implementation and rely on the suggestions and recommendations of AIT experts. Thus, the findings of the current study suggest that users of AIT consider top management support as less relevant than other determinants in determining AIT usage in the Nigerian banking sector. Therefore, top management support does not directly influence AIT usage in the context of the Nigerian banking sector but provides an enabling environment in which AITs are developed and implemented.

6.3 Discussion of Findings of Moderating Hypotheses

Based on the review of past studies, the conclusion was reached that a need existed to expand the body of knowledge in AIT usage literature in part because of the inconsistent results of previous studies. This was achieved by subjecting some of the direct relationships discussed in the previous section to a test of the moderating effect of external consultant involvement. External support has been recognized as one key determinant of AIT usage in an organization because external consultant involvement may bring an outside perspective into the organization, which may significantly contribute to the success of this system (Thong et al., 1994). A high-quality external consultant has the ability to carry-out many tasks that organizations may be unable to handle themselves. Thus, involvement of external consultant can be an invaluable resource for AIT success in organizations (Ifinedo, 2008).

To achieve effective AIT usage, a need exists to have the support of an external consultant in the form of extended technical support and adequate maintenance during and after the implementation of the systems (Dezdar & Ainin, 2010). An external consultant is defined in the context of current study as a specialist who has technical knowledge and experience on how AIT operates and can assist users in understanding a system to utilize its potentials to the fullest extent. Therefore, this study identified and theorized that external consultant involvement moderates the relationship between the DeLone and McLean independent variables and AIT usage. Thus, three hypotheses were formulated and tested. The following section discusses these findings.

6.3.1 System Quality * External Consultant Involvement * AIT Usage

An external consultant is defined in the context of current study as a specialist who has technical knowledge and experience on how AIT operates and can assist the users in understanding the system to utilize its potentials to the fullest extent. Due to conflicting findings in the past literature, this study subjects the relationships between system quality and AIT usage to the moderation of external consultant involvement. The hypothesis posits an interactive effect in this path that external consultant involvement moderates the significant and positive relationship between system quality and AIT usage, such that the relationship will be stronger for banks with a more effective external consultant than banks with a less effective external consultant.

The hypothesized relationship was supported, and the result revealed that the relationship is stronger for banks with a more effective external consultant, but weaker for banks with a less effective external consultant. This is consistent with the assertions of Thong et al. (1994), who concluded that the level of AIT usage was higher in firm with a high level of external support than those with a low level of external support. Moreover, Ifinedo (2011) indicated that system quality will be higher when a knowledgeable, dependable and reliable external consultant is engaged. The finding of the current study implied that external consultant involvement provides banks with extended technical support regarding system maintenance and upgrades, performing information requirement analysis, and recommending suitable AIT solutions. Moreover, the result implied that the user(s) perceived external consultant to be cooperative and knowledgeable, thus, assisting them in managing their AIT resources

and also strengthening the internal relationships among banks employees. Hence, a lack of involvement of a external consultant may negatively affect the system quality. Put simply, the involvement of external consultant enhances the positive effect of system quality on AIT usage in the Nigerian banking sector.

6.3.2 Information Quality * External Consultant Involvement * AIT Usage

The hypothesized interacting effect in this path postulated that AIT usage of banks with more effective external consultant would be stronger than those with a less effective external consultant. Likewise, this hypothesis was supported. The findings revealed that external consultant involvement significantly moderates the relationship between information quality and AIT usage.

The finding empirically confirms the observations of previous study that the level of AIT usage was higher in firms with a high level of external consultant support than those with a low level of external support (Thong et al., 1994). Consistent with the current study's finding Ifinedo (2011) indicated that information quality will be higher when the external consultant possesses quality attributes such as good technical expertise, reliability and dependability. This is congruent with the supposition of Baron and Kenny (1986) that a moderator can strengthen or weaken a relationship between an independent and a dependent variable.

In the current study, the intervention of external consultant involvement as a moderator on the relationship between information quality and AIT usage strengthened the

relationship. This finding corroborates the results of the current study for the direct relationship between information quality and AIT usage.

The finding further revealed the importance of the information quality (including its attributes; accuracy, completeness, and timeliness) as significant contributors to AIT usage. For information to be relevant to the user(s), information that is produced must satisfy and enable a user to make an effective decision. Also, the information needs to be complete, error free and communicated the right time to the intended user(s). The findings of the study suggested that high-quality output is information that is desirable to managers of the banks in terms of content and format and enriched with some attributes such as timeliness, accuracy, and relevance. In other words, external consultant involvement enhances the positive effect of information quality on AIT usage in the Nigerian banking sector.

6.3.3 Service Quality * External Consultant Involvement* AIT Usage

For the moderation effect of external consultant involvement on the relationship between service quality and AIT usage, the hypothesis posited that external consultant involvement would moderate the significant relationship between service quality and AIT usage such that the relationship would be stronger for banks with a more effective external consultant than banks with a less effective external consultant. The results revealed that external consultant involvement strengthened the positive effect of service quality on AIT usage, which is consistent with the assertions of Baron and Kenny (1986).

Therefore, by having adequate support from the IT unit personnel in the event of any problem through excellent relationship with users in a timely manner user(s) may be motivated to learn and explore more functions of the system. This, thereby, solves the problem of under-utilization and maintenance issues of the system. Thus, the appreciation of service quality will be higher where the external consultant is perceived to possess adequate technical expertise, good communication skills, reliability, and dependability qualities. Similarly, the findings empirically confirm the observations of previous study that the level of AIT usage was higher in firms with a higher level of external support than those with a lower level of external support (Thong et al., 1994; Ifinedo, 2011).

Although the direct relationship between service quality and AIT usage was not statistically significant, the findings of the moderating effect between service quality and AIT usage revealed that an external consultant is an important moderating variable for this relationship. Such a moderator is known as “pure moderator” because it is not related to either the predictor variable or the criterion variable but rather to moderate with the predictor to modify the form of relationship (Sharma, Durand, & Gur-Arie, 1981).

6.4 Discussion of Research Objectives

The discussions in this section were carried out based on the practical and theoretical issues highlighted in the problem statement. Two research questions were stated to

answer the research questions; then the questions were transformed into research objectives. After that, the objectives were transmuted into hypotheses and subsequently verified empirically.

The first research objective of the current study was to examine the influence of six independent variables on AIT usage in Nigerian banking sector including: 1) system quality, 2) information quality, 3) service quality, 4) internal control quality, 5) training, and 6) top management support. Subsequently, these constructs were hypothesized and tested as direct drivers of AIT usage. Based on the results of the hypothesis testing presented in Chapter Five, three of the six hypotheses were accepted (system quality, information quality, and internal control) while service quality, training, and top management support were not accepted. The accepted hypotheses confirmed the findings of previous studies and the justification of the findings, and the possible explanations for the contrary findings were presented in section 6.2. Therefore, the set objective of the study was achieved.

The next objective of this study was to determine the moderating effect of external consultant on the influence between system quality, information quality, and service quality on AIT usage in Nigerian banking sector. The argument said that the relationship would be stronger for banks with a more effective external consultant than those with a less effective external consultant. Consequently, three hypotheses were formulated and tested. The results of the hypothesis testing revealed that all the hypotheses were supported. Accordingly, a discussion of the justification of the results

was presented in section 6.3. Thus, the objective was also achieved. Therefore, having discussed on the objectives of this study, the next section discusses the implications arising from theoretical, methodological, and practical contributions.

6.5 Theoretical, Methodological, and Practical Contributions

This section discussed on the theoretical, methodological and practical contributions made by the current study. For a clearer discussion, the section is divided into three subsections as follows.

6.5.1 Theoretical Contributions

The conceptual framework of the current study in Chapter Two was developed in line with empirical and theoretical gaps not addressed by the extant literature. The framework was underpinned and supported by two theories: the DeLone and McLean model (1992 & 2003) and the Resource-based View theory (Barney, 1991). Even though what constitutes a theoretical contribution is still a subject of debate in the academic literature, Phillips and Pugh (2010) highlighted what makes a Ph.D. work original. This includes synthesizing what was previously fragmented and adding constructs to the existing theory among others. In line with this, Whetten (2009) opined that formulations of novel theory or an extension of the existing ones are considered as a theoretical contribution. Whetten (2009) further emphasized the need of context in theory development. Context-specific theory development emphasizes the interplay among the characteristics of IT such as AIT, users, and usage contexts (Hong et al., 2014).

Context is defined as a set of factors that exert influence either directly or indirectly on a phenomenon (Whetten, 2009) and is an important driver of cognition, attitudes, and behavior, or moderator of relationships among lower level phenomena (Bamberger, 2008). Several scholars have called for additional study of the context, For example, Petter et al. (2013) explored determinants omitted from the DeLone and McLean model to answer the need for more comprehensive study of the variables. Moreover, DeLone and McLean (2016) emphasized the need for future researchers to explore a specific IS context rather than general IS. After a careful consideration of the context of the study and extant literature review, this current study proposed and extended the DeLone and McLean model within a specific AIT-adapted environment with an independent and moderating variable.

Based on the review of previous literature, previous researchers paid little attention to the influence of internal control quality on AIT usage; thus, the current study incorporated the construct to the existing model. The construct was operationalized as reflective construct, and the findings revealed that internal control quality is an important determinant of AIT usage in the Nigerian banking sector. Interestingly, looking at Hong et al.'s (2014) approaches to theory contextualization in IT research, the current study is single-context driven because this study added a new construct to the existing model of AIT usage. Therefore, this study advocates the inclusion of internal control quality as an important driver of AIT measurement.

6.5.1.1 Specific Contribution to the DeLone and McLean Model

In the domain of IT theory, this study offered additional theoretical implication by providing empirical evidence not addressed by the extant literature. The theory regards e-commerce success measures as multidimensional constructs and proposes a research model for the causal relationship between the dimensions involved. The model was later updated, and many studies have adopted it in various IT contexts, including the banks (DeLone & McLean, 1992; 2003). Considering this theoretical insight, three measures of success were investigated to examine the influence of AIT usage in the context of Nigerian banking sector. These three measures are: 1) system quality, 2) information quality, and 3) service quality. Although analysis from the direct relationship between service quality on AIT usage was not significant, system and information quality were found to be the most important factors and showed significant relationship with AIT usage. To address the problem of inconsistency findings as was highlighted in Chapter Three, this study examines the moderating effect of external consultant involvement on the quality measures and AIT usage.

Therefore, as a theoretical contribution, the findings of the study indicated that external consultant involvement strengthens the significant and positive relationship between system quality, information quality service quality, and AIT usage. This means that external consultant involvement is an important moderating variable between the predictors and criterion variables in AIT usage study. Nevertheless, drawing on the empirical findings and the discussion above, the current study has provided new evidence in the IT theory domain. Based on knowledge, this theoretical

implication in the domain of IT usage theory in general and AIT usage, in particular, is new theoretical evidence from a global perspective. Hence, attention should be given to the role of external consultant involvement in the usage of the technology. Thus, this study advocates that external consultant involvement be included as an important moderator variable in the domain of AIT usage literature.

6.5.1.2 Specific Contribution to Resource-based View Theory

In the domain of RBV, the current study offered theoretical implications by providing more evidence to AIT literature. The resource-based view emphasizes that if capabilities are unique, appropriate, and valuable, then these qualities will enable organizations to gain a competitive advantage if they are non-substitutable, in-imitable and immobile (Barney, 1991). Thus, leading to AIT usage success.

Specifically, the theory emphasizes that, to achieve a sustain competitive advantage in a highly dynamic business environment that is characterized with rapid advancement in IT, banks should add unique AIT-related capabilities (internal control, training, top management support, and external consultant) to their AIT because the successful integration of these resources will enable banks to achieve a unique use of its AIT when compared with other competitors, thereby reaping the expected benefits of their huge investments in AIT. This, in turn, will lead to the achievement of the desired goals of AIT usage success.

Therefore, this study has provided additional evidence in the domain of RBV theory from the context of Nigerian banking sector in two ways. First, it shows how different AIT determinants such as internal control quality, training, and top management support predict AIT usage in banks. Second, this study provides new evidence on the domain of RBV theory, in that it integrated the moderating effect of external consultant effectiveness on the influence of system, information, and service quality on AIT usage. Hence, a sustainable competitive advantage flows from the internal capabilities of the banks and AIT resources that are unique, valuable and imperfectly imitable. In sustaining a competitive advantage, bank management should implement strategies based on their organization's internal strength, abilities to respond to environmental opportunities and threats, and improve internal weaknesses. Based on this researcher's knowledge, this is new theoretical evidence from a global perspective.

6.5.2 Methodological Implications and Contributions

Qualitative analyses and the use of simple statistical approaches have dominated the methodologies used in evaluating the determinants of AIT usage. For instance, the DeLone and McLean model (1992, 2003), surveyed more than 180 studies in IS to develop a model of AIT usage. Unfortunately, the model was not tested empirically (Nicaoula, 2000; Nelson et al., 2005), thus, calling for future researchers to validate the model. Other studies such as Kanungo et al. (1999), Bentley et al. (2013), and Khassawneh (2014) have used qualitative approaches to explore the determinants of AIT. Another stream of researchers like Ismail (2009), Hien et al. (2014), Shih and

Lin (2011), and Nabizadeh and Omrani (2014) employed simple analytical tools such as SPSS in drawing their findings. Thus, the authors called for the future study using better tools to verify their findings. This could mean that many past studies might be characterized by erroneous approaches in research design and data analysis. In answering this call, the current study employed survey research, and data were analyzed using the more robust statistical tool of PLS.

Second is the measurement mode of the internal control quality that is a new construct that extended the DeLone and McLean model, which had not been specified. The internal control quality construct was adapted from Alzaoubi (2011); however, the author was silent on whether the indicators should be reflective or formative. Therefore, this current study specified the measurement mode of the construct as reflective based on the criteria highlighted in Hair et al. (2014) such as the direction of causality, whether the indicator could be expected to have similar antecedents and consequences, and covariations among the indicators. Specifically, the measurement mode of the indicators satisfied the requirements relating to indicator loadings, the convergent validity that was evaluated using AVE of the construct, and the internal consistency that was evaluated using composite reliability. Thus, the current study provided the measurement mode for application and validation by future studies.

Similarly, despite the conceptualization of the system quality and information quality measures as a composite concept in DeLone and McLean's (1992; 2003) model, previous studies (Argyropoulou, 2011; Hien et al., 2014) treated these constructs

reflectively. However, an incorrect specification of the measurement model may lead to specification biases and subsequently make the interpretation of results difficult (Petter et al., 2007). Therefore, this current study treated the constructs as second-order formative constructs, thereby correcting the flaws of previous studies by enhancing the validity of the constructs and improving the statistical conclusion of the findings.

6.5.3 Practical Implications and Contributions

The findings of current study provide sufficient evidence for confirming a significant causal relationship among the three major constructs and three moderating three causal paths each. The results were drawn based on the statistical findings, and the practical recommendations were consequently derived logically from the results. Therefore, this study provides bank managers, academics, and practitioners with more insights regarding the implications of AIT usage in the Nigerian banking sector.

The study provides empirical evidence that system quality is significantly related to AIT usage. Results from the context of this study imply that banks in Nigeria are more sensitive to finding more security to protect their customer's confidential information. Furthermore, the findings suggest that a system should be designed in a manner in which users will find it easy to use and efficient in carrying out their day- to-day routines. Having a well-designed system plays an important role in increased revenues and the quality of work processes and save costs of banking services. Banks employ AIT to improve process efficiency such as collecting and transforming the large scale

of data used for tactical and strategic decision-making by managers. Similarly, to produce application that meets users' satisfaction, designers should put an emphasis on the security, ease of use, and efficiency dimensions because they have proven to be significant characteristics of system quality in the context of Nigerian banks.

Moreover, information quality has a significant relationship with AIT usage in the context of Nigerian banks. This implies that several characteristics of evaluation measures are important to the users, including the accuracy of the output information and the availability of the information at the right time. These improve a user's ability to rely on AIT to carry out different tasks across different functional areas of the banks such as the real-time transaction processing (e.g., online transfers, withdrawals, and or deposits) for bank customers. Thus, this improves the quality of products and services offered to users, leading subsequently to AIT usage in Nigeria. Hence, managers should be concerned with these important key attributes because of their importance to quality information.

Similarly, internal control quality was found to have a significant and positive effect on AIT usage. The implication of this is that view of user perceptions that having an adequate internal control system environment prevents undesirable practices in the performance of their daily routines, a good internal control structure could protect the AIT from problems such as fraud and error. Thus, this will enable banks to generate more accurate and timely information for strategic and operational decision-making. In turn, this would lead to increased large-scale productivity and financial gains for

the banks. In this regards, this would increase shareholder funds. Therefore, bank managers should give attention to internal control quality because it can add value to their business and assist in enhancing bank performance thereby achieving competitive advantages.

The study provides evidence that external consultant involvement has an effect on the relationship between system quality and AIT usage. The results revealed that bank managers and practitioners should be more concerned about technical efficiency that facilitates job completion and the security of the system, which would prevent various attacks and unauthorized access to the AIT.

From the perspective of system designers, the findings of this study suggest that they should place more emphasis on the quality of the system due to its focus on the technical aspect of the systems. A good system reduces costs and increases productivity as well as facilitating decision making, which leads to the achievement of goals and objectives. Based on this, bank managers should ensure that the system quality is excellent. This would reduce the problems of system failure and technical difficulties. Consequently, this would improve user satisfaction with the system, support different transaction processing activities of the banks, and facilitate effective decision making. Also, practitioners would find it easier to evaluate AIT, thereby enabling banks to realize the benefit expected of their investments.

Also, empirical evidence revealed that external consultant involvement influences the relationship between information quality and AIT usage. This finding implies that users believe that higher information quality is critical in making economic decisions. Put differently, management decision making is contingent on the accuracy, reliability, timeliness, and completeness of the information produced. Consequently, bank managers should pay close attention to the attributes of information quality of their AIT usage. Thus, to effectively utilize and reap the promised benefits of their huge investment, addressing the problem of the persistent failure of AIT is critical.

Furthermore, based on the statistical findings, external consultant involvement positively impacts the relationship between service quality and AIT usage. These findings revealed that external consultant involvement strengthened the positive effect of service quality on AIT usage in the banks, implying that the more management focuses on service quality delivery to users, the greater will be the positive effect on AIT usage of the banks. This situation ensures effective financial transaction processing and the availability of accurate and up-to-date information to decision makers, which will improve the decision-making processes in the banks on the one hand. On the other hand, this contributes to the efficient and effective service delivery to bank customers.

Based on this finding, managers of banks should ensure that quality service is delivered to users in such a way that users are satisfied and delighted with the technology. This, in turn, would strengthen the relationship among banks employees

as well as their relationship with their customers, thus, enhancing the corporate image of the bank. Consequently, this would enable banks to capture a larger segment in the market environment and be able to have higher returns on their investments on AIT. Also, this would translate to enhancing the socioeconomic activities of the society at large.

In summary, the findings of this study imply that managers, practitioners, and academics should promote and give close attention to these key determinants as they have significant effects on AIT usage. Therefore, the management of Nigerian banks needs to pay close attention and to integrate these factors, as this would likely improve the problem of the system ineffectiveness. Consequently, this would assist banks in fully actualizing their desired goal of having an effective system, thereby enabling banks to reap the promising benefits of their huge investments in AIT.

6.6 Limitations and Recommendation for Future Research

Although current study provided answers to the research questions raised in Chapter One, the study has several limitations. These limitations are hereby highlighted and discussed.

First, measuring the relationship between predictors (determinants) variable and the criterion variable (AIT usage) as well as the moderating effects of the external consultant involvement were carried out using subjective data collected through survey questionnaires. Dunlop and Lee (2014) argued that the use of subject measures

may be prone to judgmental bias. Therefore, to minimize this type of bias future studies should explore the adoption of both subjective and objective assessments of AIT usage to replicate the findings.

Second, the cases used in the current study were limited to 257 valid responses, obtained from managers and account managers of the regional or branch offices of the banks in three regions of Nigeria. The sample was sufficient based on the 571 questionnaires distributed, representing about 48.3% that was in line with Sekaran's (2003) guidelines. Nonetheless, future studies should increase the sample size relative to their total population. This will enhance the generalizability of their findings.

Third, the integrated framework of this study could explain 35.1% (including the moderator) of the variation in AIT usage in Nigerian banks. This means that 64.4% of the variation in the AIT usage framework in Nigeria could be explained by other variables not considered in this study. Therefore, future studies should explore other factors such as user satisfaction as the DeLone and McLean model (2003) highlighted.

Finally, the discussed findings and implications of the current study were carried out through a cross-sectional approach, which examines a single sector in Nigerian. Thus, caution needs to be taken when generalizing the findings to other sectors. Therefore, future study should validate the framework of this study using a longitudinal approach in different sectors and different contexts. This might enhance the understanding of the determinants of AIT usage.

6.7 Conclusion

To conclude this thesis, recapitulating what this study intended to achieve is important. This study was motivated because the investment in AIT has failed to deliver the expected benefit to banks in Nigeria due to persistent failure. Nonetheless, past studies have attempted to study the determinants of AIT usage to enable organizations such as the banks to achieve the promising benefits of their investments. However, such efforts have been an elusive goal for both practitioners and academics, and few studies have been conducted in response to this phenomenon. Therefore, this study examined the relationship between system quality, information quality, service quality, internal control quality, training, and top management support on AIT usage. The study further investigated the moderating effect of external consultant involvement on the relationship between system quality, information quality, service quality, and AIT usage. Thus, this study achieved all its objectives and answered all the research questions.

However, the existing literature has not been comprehensive in investigating the determinants of AIT usage. The current study conceptualized internal control quality as a determinant of AIT usage, and the results of current study lend support to key theoretical propositions of the existing DeLone and McLean model of 2003 and other similar empirical evidence in the literature. It provides evidence about the relationship between the determinants and AIT usage in the Nigerian banking sector. Furthermore, the study also revealed how external consultant involvement theoretically moderates the relationship between some determinants and AIT usage.

In conclusion, his chapter highlights and summarizes the entire thesis. The study added theoretical and practical implications to the body of knowledge and practitioners in the domain of AIT usage in Nigeria. It also provides guidance to managers to develop strategies for realizing the benefits of their investment in AIT. To sustain a competitive advantage, bank management should implement strategies based on their organization's internal strengths and abilities to respond to environmental opportunities and threats and improve internal weaknesses. In line with its limitations, the study offers direction for future research both in Nigeria and across the globe.



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Appendix A

Determining sample size for a given population

Population size	Sample size	Population size	Sample size	Population size	Sample size
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361

110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	260	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

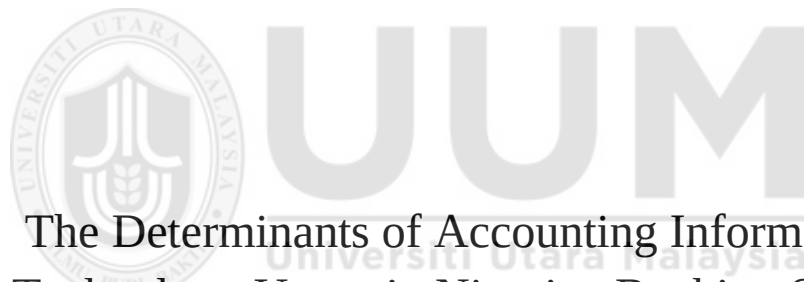


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APPENDIX B



RESEARCH QUESTIONNAIRE



The Determinants of Accounting Information Technology Usage in Nigerian Banking Sector

The questionnaire will take fifteen minutes to complete. Your objective response would be highly appreciated as it will contribute immensely in generating reliable evidence that can assist managers and other decision makers in the Nigerian banking sector, in order to understand the factors that results to accounting information technology failures. Please, be rest assured that your response will be treated with utmost confidentiality as it will exclusively use for academic purpose.

PART A

*Please indicate the extent of your agreement with each of the following statement by circling the appropriate option using the scale below. Please note that AIT stands for **Accounting Information Technology**.*

1- Strongly Disagree (SD), 2- Disagree (D), 3- Not Sure (NS), 4- Agree (A), 5- Strongly Agree (SA).

		SD	D	NS	A	SA
		1	2	3	4	5
1	The AIT assists our bank in achieving a competitive advantage.					
2	The use of AIT helps in satisfying our customers.					
3	The use of AIT does not facilitate effective integration between departments in our bank.					
4	The use of AIT does not assist in reducing cost.					
5	The use of AIT issues periodic report on all the organization activities for decision making.					
6	The use of AIT allows our bank to save a lot of time.					
7	The use of AIT enables us to manage our task effectively.					
		SD	D	NS	A	SA
		1	2	3	4	5
8	User login is required to access the online banking facilities.					
9	Auto logout is enabled after a period of inactivity online.					
10	The antivirus software does not prevent the systems from being attacked by virus.					
11	Our AIT is not regularly examined and maintained by IT unit staff.					
12	The user interface of our bank information systems is easy to use.					
13	The tutorials or instructions provided by our AIT help me to use the system easily.					
14	The user interface design by our AIT is user friendly.					
15	I understand every function of the AIT.					
16	I am not familiar with the interface of our AIT.					

17	The user interface items of our AIT are easy to understand.					
18	Our AIS greatly facilitates my work efficiency.					
19	The processing speed of the AIT assists me in accomplishing my work very fast.					
		SD	D	NS	A	SA
		1	2	3	4	5
20	Our AIT does not provide me with accurate information.					
21	Our AIT does not provide me with relevant information.					
22	Our AIT does not provide me with the necessary information in a timely manner.					
23	The information contained in our website is timely and regularly updated.					
24	The information from our AIT improves the quality of my work.					
25	Our AIT does not provide sufficient information related to my task.					
26	Our AIT provides me with comprehensive information to complete my task.					
		SD	D	NS	A	SA
		1	2	3	4	5
27	When I have problem, the official of the bank IT units show a sincere interest in solving it.					
28	The employees of the bank IT units does not have the knowledge to maintain the system and solve the problems well.					
29	The employees of the bank IT units have never given me personal attentions.					
		SD	D	NS	A	SA
		1	2	3	4	5
30	Our AIT does not improve the controls of breaking through or trespassing of the system.					
31	Our AIT regulates the access of employees to the system according to their level of authorization.					
32	Our AIT contributes in segregating the discrepant tasks among employees in the bank.					

33 Our AIT does not enable the linkage across all branches
of the banks properly and appropriately.

34 Our AIT is in-effective in safeguarding against internal
and external threats.

35 Our AIT does not provide the document needed to follow
up work and evaluate performance.

36 Our AIT provides appropriate method that ensures proper
data entry and processing in order to obtain the required
output.

37 Our AIT provides a library and archive to all files,
programs and data which can be stored in separate tools.

SD	D	NS	A	SA
1	2	3	4	5

38 The AIT training programs provided by my bank are not
useful.

39 The AIT training programmes provided covers specific
needs.

40 The AIT training programmes provided does not cover
our needs.

41 The AIT training programmes are organised regularly

42 The AIT training programmes are not educative.

43 The AIT training programs are cost effective.

44 The AIT training programmes help me learn the various
system uses.

SD	D	NS	A	SA
1	2	3	4	5

45 Top management does not provide the resources needed
for the implementation of our AIT systems.

46 Every departments are of equal importance.

47 I am not satisfied with the changes that the top
management decides on AIT issues such as financial
support.

48 Top management encourage the sharing of information in
our bank.

SD	D	NS	A	SA
1	2	3	4	5

- 49 Our consultant is effective in performing information requirement analysis.
- 50 Our consultant is effective in recommending suitable AIT solution.
- 51 Our consultant does not response rapidly in case of emergency.
- 52 Our consultant facilitates internal relationship.
- 53 Our consultant does not provides adequate technical support if needed.
-

PART B

Accounting Information Technology

Among the following Accounting Information Technology subsystems, Please tick the applications presently implemented in your Bank (You may tick one or more boxes if appropriate).

Transaction Processing System
General Ledger System
Financial Reporting System
Management Reporting System

☐
☐
☐
☐

Please indicate your demographic background by ticking the appropriate option:

1- Age:

Below 30 years
30-39 years
40-49 years
50-59 years
60 years and above

☐
☐
☐
☐
☐

2- Gender:

Male
Female

☐
☐

3- Highest Qualification:

Diploma
Degree

☐
☐
☐

Masters

PhD

☐

4- Working Experience:

Below 5 years

☐

5-9 years

☐

10-14 years

☐

15 years and above

☐

5- Job Position (Please specify).....

Thank you for taking your precious time to complete this questionnaire. Your support in providing this information is highly appreciated

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APPENDIX C

Summary of Determinants of Accounting Information Systems

Author	Context	Independent Variables	Moderator/Mediator
Abdallah (2013)	Jordanian tax authority	Information quality	
Ahmad et al. (2013)	Jordanian organizations	Information quality	
Abu Taber et al. (2014)	Jordanian Private Higher Institutions	Human Resources, Hardware, Software, and Databases	
Hien et al. (2014)	Hong University	Information quality, system quality and service quality	Use and user satisfaction
Daoud and Triki (2013)	Tunisian Organizations	Information quality, accounting practices used, and systems quality	Accounting staff competency
Al-Oleemat (2014)	Jordanian Public Universities	Knowledge, Creativity, and Skills	
Anggadini (2015)	Indonesian Organizations	Top management support and Internal control	Accounting Information system quality

Gorla et al. (2010)	In Hong Kong Organizations	information quality, system quality, service quality	
El-Dalabeeh, & Al-Shbiel, (2012)	Saudi Hospital	Human resource, hardware equipment, software, databases and procedures	
Alzoubi, (2011)	Jordanian organizations	Quality of accounting information, and internal control	
Elpez and Fink (2006)	Western Australian organizations	Information quality, system usability, expenditure control, interaction with IT infrastructure, accountability and user acceptance	
Awosejo et al. (2013)	South African Financial institutions	Perceived usefulness and Perceived ease of use	Intention to Use
Bach et al. (2011)	Financial Service firms in South Africa	Information quality, system quality and service quality	Intention to use and user satisfaction

Balqaa (2012)	Jordanian Communication companies	Hardware, software, network, and databases Low data quality, Lack of system specification, lack of communication within the system, inflexibility of the systems, and poor system management
Bentley et al. (2013)	UK Higher Education	Security and general control of organization, security and general control for IT and application controls for transaction processing
Bawaneh, (2014)	Jordanian Banks	Age, users' involvement and tenure in office, organizational level, and education
Khalil and Elkordy (2001)	In Egyptian Banks	

Hayale and Abu-Khadra (2006)	Jordanian Banks	Effective control system and perception of User	
Chang (2003)	Taiwan Organizations	Timeliness, scope and aggregate	Decentralization and task uncertainty
Coman and Coman (2013)	SMEs in Romania	Information Quality and System Usage	
Kanungo et al. (1999)	Indian Institute of Technology	Facilitating information retrieval, improving product, services quality, and system integration	
Khassawneh (2014)	Jordanian SME's	AIS sophistication, managers tenure, firm size and internal experts	
Moolanazir and Abdolkarimi (2012)	Tehran Stock Exchange	Task uncertainty, user satisfaction, AIS characteristics and decentralization	

Nabizadeh and Omrani (2014)	SMEs in India	External and internal consultant, firm size and managerial knowledge
Ramezan (2009)	Iranian Oil sector	System quality, information quality and system use
Shatat (2013)	Jordanian Banks	Information quality, system quality and service quality
Shih and Lin (2011)	Taiwan Hospital	System quality, information quality and service quality ICT infrastructure, cost of adoption, users' perception of the system and human resource proficiency
Nyang'au, Okibo, and Nyang'au (2015)	In Kenyan's Organizations	
Seddon et al. (2002)	In European and US Organizations	Systems quality and information quality
Pathar et al. (2003)	South African Organizations	User satisfaction and measuring service quality

Malik (2001)	Indian automobile industry	Products, process, and environment perspectives
Chalu (2012)	Tanzanian local authority	Management support, external auditors, specialization and councilor's involvement
Ortiz et al. (2007)	Canadian SME's	Managerial support and vendor support
Kankanhalli et al. (2003)	In Singapore	organizational size, top management support
Cho (2007)	Hong Kong Organizations	Management support and training
Hamdan (2004)	Organizational context	Top management support, training and users' involvement, with AIS effectiveness
Saliem et al. (2003)	Egyptian Organizations	Management supports and user involvement
Rahayu (2012)	Indonesian public organizations	Management commitment and data quality

Ismail (2009)	SMEs in Malaysia	Managerial accounting knowledge, the effectiveness of accounting firm, vendors, AIS sophistication, managers AIS knowledge, government agencies and consultant effectiveness
Harash et al. (2014)	SMEs in Iraq	Reliability, relevance, and timeliness
Mamic and Oluic (2013)	Croatian large organizations	speed, accuracy and quality information
Tona et al. (2012)	Sweden Public Organizations	System quality and information quality, User satisfaction, individual impact
Lam et al. (2014)	Vietnam University	System quality and service quality

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.850	18.585	18.585	9.850	18.585	18.585
2	2.845	5.368	23.953	2.845	5.368	23.953
3	2.204	4.159	28.112	2.204	4.159	28.112
4	2.046	3.861	31.973	2.046	3.861	31.973
5	1.940	3.660	35.633	1.940	3.660	35.633
6	1.876	3.540	39.173	1.876	3.540	39.173
7	1.670	3.151	42.325	1.670	3.151	42.325
8	1.568	2.958	45.282	1.568	2.958	45.282
9	1.488	2.807	48.090	1.488	2.807	48.090

10	1.343	2.534	50.624	1.343	2.534	50.624
11	1.313	2.478	53.102	1.313	2.478	53.102
12	1.227	2.315	55.417	1.227	2.315	55.417
13	1.170	2.207	57.623	1.170	2.207	57.623
14	1.124	2.120	59.743	1.124	2.120	59.743
15	1.093	2.063	61.806	1.093	2.063	61.806
16	1.006	1.899	63.705	1.006	1.899	63.705
17	.989	1.866	65.570			
18	.961	1.814	67.384			
19	.937	1.768	69.153			
20	.842	1.589	70.741			
21	.837	1.579	72.320			

22	.813	1.534	73.854			
23	.782	1.476	75.329			
24	.762	1.438	76.767			
25	.722	1.362	78.130			
26	.711	1.342	79.471			
27	.691	1.303	80.774			
28	.663	1.250	82.025			
29	.639	1.205	83.230			
30	.600	1.132	84.362			
31	.570	1.076	85.438			
32	.553	1.044	86.482			
33	.535	1.009	87.491			

34	.522	.984	88.475			
35	.492	.928	89.404			
36	.455	.859	90.263			
37	.449	.846	91.109			
38	.438	.827	91.936			
39	.407	.767	92.703			
40	.396	.747	93.450			
41	.375	.708	94.158			
42	.371	.699	94.857			
43	.363	.684	95.541			
44	.347	.654	96.196			
45	.297	.561	96.757			

46	.282	.532	97.289			
47	.254	.480	97.769			
48	.245	.463	98.232			
49	.218	.410	98.643			
50	.213	.403	99.045			
51	.189	.357	99.403			
52	.175	.330	99.733			
53	.142	.267	100.000			

Extraction Method: Principal Component Analysis.