# THE INFLUENCE OF SYSTEM QUALITY AND INFORMATION QUALITY ON ACCOUNTING INFORMATION SYSTEM (AIS) EFFECTIVENESS IN NIGERIAN BANKS

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## ABSTRACT

*Due to advancement in technology and the globalization of large scale organizations, banks are being faced with the issues of how well to design, coordinate and manage their Accounting Information System (AIS) to ensure effective planning and decision making. Banks in Nigeria are plagued with reported cases of persistent systems failures, system error, and inaccuracy of output, which is indeed as a result of the ineffectiveness of the system. However, limited attention has been given to the issues. This paper therefore conceptualizes the influence of system quality and information quality on AIS effectiveness. It is an attempt to develop a conceptual framework for determining AIS effectiveness in Nigerian banking sector. The aim is to provide adequate information to managers within the banks on how to reap the expected benefits of AIS as well as to facilitate prompt decision making.*

***Keywords:*** *Accounting Information System, System Quality, Information Quality, Nigerian Banks*

## 1.0 INTRODUCTION

Information and communication technology (ICT) has brought major changes in the banking industry in Nigeria, through provision of effective banking practices. Banks customers perceived ICT to enhance the effectiveness of banking services provided and to strengthen the mutual relationship between banks and its customers. Thus, the importance of Information Technology (IT) or Information System (IS) to the Nigerian banking industries cannot be overemphasised (Ayanda, Veronica & Ayodele, 2011). However, given the integrated nature of IS today, rarely is Accounting Information System (AIS) distinguished separately from IS (Gelinas, Dull, & Wheeler, 2012). An effective IS serves as a mechanism that enables banks to manage their resources effectively, and provides them with efficient service delivery system to their customers. Agbolade (2011) stated that due to the rapid changes in technology and dynamic nature of business environment as well as increased demand from customers, most organizations especially banks are left with no choice but to invest in new technology in order to meet their customers' satisfaction and to compete favourably in the industry.

Banks in Nigeria have recently increased their investment in IS as a fundamental e-banking tool, capable of yielding significant contributions to their financial results especially in terms of cost efficiency. Nevertheless, the claim is mere expectation because there is no clear evidence of banks achieving their objectives from IS investments (Adewole, 2013). According to Ibrahim and Muhammad (2013), banks have invested heavily in IS solutions for both front and back office operations, but the increased challenges of IS usage in conformity with banking best practice remained a burning issues in banking industry due to the inability of the banks to reap the expected benefits of the system. Furthermore, Ekwueme, Egbunike, and Okoye (2012) claimed that the challenges caused by IS in the Nigerian banking sector remain an issues of great concerned to the general public. This is because many customers' complaints of persistent systems failures, system error, and inaccuracy of output. Which is indeed as a result of inability of the system to do what is expected of it.

In addition, Dandago and Rufai (2014) maintained that banks are faced with the problems of AIS mismanagement, technical issues and maintenance issues, which often led to loss of customers' confidential information and low productivity. Therefore, given the foregoing discussions, it can be concluded that the system quality and information quality of the AIS needs to be explored further. Empirical evidence revealed that system quality and information quality are the most important determinants of AIS effectiveness (Katungo, Duda & Srinivas, 1999; Seddon, Graeser & Willcocks, 2002; Gorla, Somers & Wong, 2010). It is therefore imperative to consider the relationship between system quality and information quality with AIS with a view to providing solution to the persistent problems.

Previous studies have attempted to examine the influence of ICT on AIS in some banks in Nigeria (Dandago & Rufai, 2014; Dandago & Farouk, 2012). Other stream of literature focused on the impact of IT on the operational efficiency and effectiveness of the banks (Abiola, 2014; Ekwueme et al., 2012; Agbolade, 2011). However, inadequate literature on factors that determine AIS effectiveness in the Nigerian Banks is evident. Most of the empirical evidences of AIS effectiveness are confined to the developed nations, making it inadequate to generalised the findings to developing nations with entirely different social, economic, and cultural characteristic differs (Khalil & Elkordy, 2001). What seems lacking in literature is the understanding of the factors that influence the effectiveness of AIS in the banks, which this paper is set to address.

This paper begins with discussion of IT/IS in the banks, followed by highlight on the issues facing the Nigerian banks and the aim of the paper. The paper continues with definition of AIS, importance of AIS to the banking sector, and review of previous literature on AIS. Then discussion on the theoretical foundation of the paper followed next. Subsequently, the conceptual framework of the paper is presented as well as an in depth literature review on system quality and information quality. Finally, the paper offered a brief conclusion on AIS effectiveness in banks.

## 2.0 DEFINITION OF ACCOUNTING INFORMATION SYSTEM

Regarding the definition of AIS, it is important to note that there is no single or universally accepted definition of the term, as there are different definitions given from one literature to another. However, AIS is considered a logical intersection between two main broad subjects of accounting and IS (Manteghia & Jahromi, 2012). According to Swierczek and Shrestha (2003), IS refers to the use of computers and other ICT to collect, store, retrieve and reproduce information used for decision making. Tambovcevs and Tambovcevs (2013) defined IS as a set of interrelated components which increases organizational competitiveness and provides reliable information for decision making. Nicolaou (2000) stated that IS as a computer-based system that process information of financial nature and help decision makers to coordinate and control organizational activities.

Similarly, Delone and Mclean (1992) defined IS as an integrated systems which provides information in order to support operations, management analysis, processes and decision making functions in organizations. On the other hand, Grande, Estebanez and Colomina (2011) explained AIS as a tool, which if incorporated in the design of IT/IS, enables organizational managers to monitor and control financial activities. Accounting Information System comprises of qualified individuals, hardware, software databases and set of procedures which interact together to provide useful information for effective decision making within an organization (El-Dalabeeh & Al-Shbiel, 2012). On the same note, Wilkin and Chenhall (2010) related that AIS concerns with the production of accurate, relevant, cost effective and timely information to business in order to assist organizations to compete favourably in business environment.

According to Al-Kassawna (2012), AIS is the administrative components of an organization, which deals with the process of data collections, organizing and disseminating of information to various users for decisions making purposes. Amidu, Effah and Abor (2011) defined AIS as the process of collecting, organizing and reporting financial information, which has an economic value to the internal and external users of organizations. Recently, Amaefule and Iheduru (2014) defined AIS as a system, which records and reports financial activities within an organization. Similarly, Andrei-Coman and Utab (2011) defined AIS as the process of gathering, processing, storing and communicating information using the latest IS/IT.

Considering the above definitions of IS and AIS by various scholars, it is evident that both terms explained the same thing thus making it possible for scholars to conclude that the terms can be used interchangeably. Therefore, this study defines AIS as the process of collecting and disseminating of information to users to enable accurate and timely decision making within a bank.

## 3.0 IMPORTANCE OF ACCOUNTING INFORMATION SYSTEM

Banks have made IT implementation as one of their key strategies for competitive advantage, sustainability and effective decision making. It is very important for banks to understand their customers' needs and the changes in market environment in timely manner. However, previous literatures have indicated that effective AIS contributes in organizations in several ways.

Accounting information system helps organization to improve the quality of products and services, reduce waste of materials, improve the decision making and sharing of knowledge by providing competitive advantages to the organization (Bawaneh, 2014). In addition, Rodriguez and Spraakman (2012) concluded that the use of AIS, such as Enterprise Resource Planning (ERP), has enhanced the computing power and standardization of organizational activities. Thus leads to the provision of more accurate and timely information to various users in an organization. Evaluating government AIS, Al-Kassawna (2012) revealed that the systems help to provides timely financial information, which facilitates decision regarding fund borrowing and making financial policies. Likewise, Shiri (2012) found that information system increases the operational efficiency and significantly contributes to the realization of departmental potentials within an organization. It also helps in analysing organizational problems and providing possible solutions.

Impact of IS system has cut across all levels of management and functional units within organizations (Abdelhak & Dalel, 2009), as well as the type of settings in which the organization is established (Mario & Bozidar, 2012). Mario and Bozidar further stated that AIS provides organizations with competitive advantages in two ways; (i) supporting organizational effectiveness and (ii) distinction the organization model by enabling technological and methodological innovations. Relatedly, Fengyi, Olivia and Sheng (2005), argued that AIS plays an effective role in enhancing performance of modern organizations more especially in the banking sector through provision of integrated value chain system, rapid financing services, excellent fund allocation and payment, global capital logistic services and saving cost compares to the traditional bank accounting information.

Kaka and John (2010) found that, the use of IS in banks has enhanced the image of the banks and help in solving the operational and planning problems thus, leading to a wider and more efficient market. Likewise, Al-Swalhah (2014) findings revealed that effective use of AIS helps banks managers in rationalization of its administrative decision making process. He concluded that AIS effectiveness strengthens the control procedures and supervision, planning of marketing and sales operations as well as comparison and analytical future provisions in the banks. It can therefore be concluded that investment in AIS is well recognised as key to competitive advantage to banking sector, which provide enabling environment that support bank information exchange, integrate the flow of information (internal and external) and link to a supply chain platform (Rodriguez & Spraakman, 2012), which greatly enhances the relationship between bank and users.

## 4.0 OVERVIEW OF ACCOUNTING INFORMATION SYSTEM

A well design AIS adds value to an organization by reducing cost of product and improving quality. Boonmak (2008) revealed that AIS increases organizational effectiveness, in terms of cost saving and revenue generation. Several studies have been conducted regarding AIS in different organizations, and findings from these studies remains inconclusive. For example,

Al-Frijat (2013) examined the impact of AIS on the effectiveness of tax audit and tax collections in Jordan income tax department. It was revealed that, use of AIS has a positive impact on the effectiveness of tax audit and tax collections. In support of these findings, Shagari and Saad (2015) empirically found that IS has significant and positive influence on tax administration efficiency.

Unlike studies by Al-Frijat (2012) and Shagari and Saad (2015), which focused on the role of AIS in organizations, Emeka-Nwokeji (2012) focused on the effectiveness of data (information) quality in AIS adopted environment. The findings revealed that information quality reduces cost and improves organizational performance. However, the study used only two organizations as a sample, and hence the findings of the study are prone to generalization problem. In a related study, Ahmad, Ayasra and Zawaideh (2013) examined the effectiveness of AIS in relation to data quality, stakeholders, and audit issues. The findings revealed that there is significant relationship between data quality and AIS effectiveness. They concluded that to achieve successful implementation of AIS both the system and organizational factors should be considered.

Similarly, Sambasivam and Assefa (2013) examined the effectiveness of AIS in manufacturing companies in Ethiopia. A survey research approach was used in the study. The result of the study revealed that AIS have a significant influence on information quality while no relationship was found between AIS and improvement of organizational performance. It was concluded that AIS design and implementation is effective except for achieving organizational performance. In contrast, Stefanoul (2012) documented that post implementation of IS have positive and significant impact on organizations.

Study by Bach et al. (2011) evaluated the influence of user perceptions on AIS effectiveness. Users' feedback and technology partner were used as antecedent variables, independent variables of the study are information quality, system quality and service quality. Furthermore, intention to use, and user satisfaction were used as moderators. The empirical results of the study indicated that system quality, service quality and information quality have significant relationship with AIS effectiveness.

Contrary, to the quantitative method used by Bach et al. (2011), Tona, Carlsson and Eom (2012) employed mixed research approach in their study. Out 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 showed that only five out of eight hypotheses tested were significant. They are; system quality and information quality were found to influence users' satisfaction. Moreover, system quality influences use and users' satisfaction, which ultimately influence individual impact.

Survey conducted by Alzoubi (2011) involved financial managers and accountants of organizations in Jordan aimed to determine AIS effectiveness in ERP adopted environment. The empirical results of the study showed that information quality and internal control have significant influence on AIS effectiveness. Nevertheless, the study weightily required justifications and also the sample size of the study is small. Thus, the research findings are prone to generalizability issues.

Recent study by Shatat, Yusof and Abdulaziz (2013) in which about 500 survey instruments were distributed to top middle and lower level managers in the banks in an attempt to investigate the Business Intelligent System (BIS). The study examined the impact of system

quality, information quality and service quality on BIS effectiveness. A descriptive statistics was used to analyse the 97 valid responses collected. The result of the study indicated that information quality, system quality and service quality have a significant influence and increased the effectiveness of BIS in banks. This study focused on another AIS application, which is BI, however, our interest here is the application of information quality and system quality to test the BIS effectiveness. In general, considering the results of previous literature, it can be concluded that examining system quality and information quality on AIS effectiveness in banking sector would provide good understanding of the determinants of AIS effectiveness in banks.

## 5.0 THEORETICAL FOUNDATION

One of the model that is commonly use in IS study is the Delone and Mclean success model of 1992. Delone and Mclean proposed an IS success model consisting of six key dimensions which are as follows; (i) system quality (the technical quality of the system) and (ii) information quality (the quality of the out produced), which individually and mutually affect both (iii) system usage and (iv) user satisfaction. Usage and user satisfaction are antecedents of (v) individual impact and lastly the (vi) individual performance affect organizational impact (organizational performance).

In 2003, Delone and Mclean refined their earlier model in responses to the criticism of some authors. They proposed a more unified model, which they described as follows; the information quality, system quality, and service quality singularly and mutually affect intention to use and user satisfaction. Furthermore, intention to use affects net benefit. This model has been described by many authors as the most appropriate basis for both theoretical and empirical future research. For example, the model is considered as the best known and most complete model in IS success (Seddon, 1997; Ballantine, Levy & Powell, 1998). Similarly, Al-Mushayt (2000) opined that the model is valid and reliable in AIS context. On the same note Ismail (2009) used the model in an attempt to examine the determinants of AIS effectiveness in Malaysia. Recently, Daoud and Triki (2013), Quintero et al. (2009), Ali and Younes (2013) used the model in their studies. Therefore, this paper will equally adopt this model. The framework of the paper is depicted in *Figure 1*.

## 6.0 CONCEPTUAL FRAMEWORK

Below is the framework of the paper, showing the relationship between the independent variables (System quality and Information quality) and dependent variable (AIS Effectiveness).

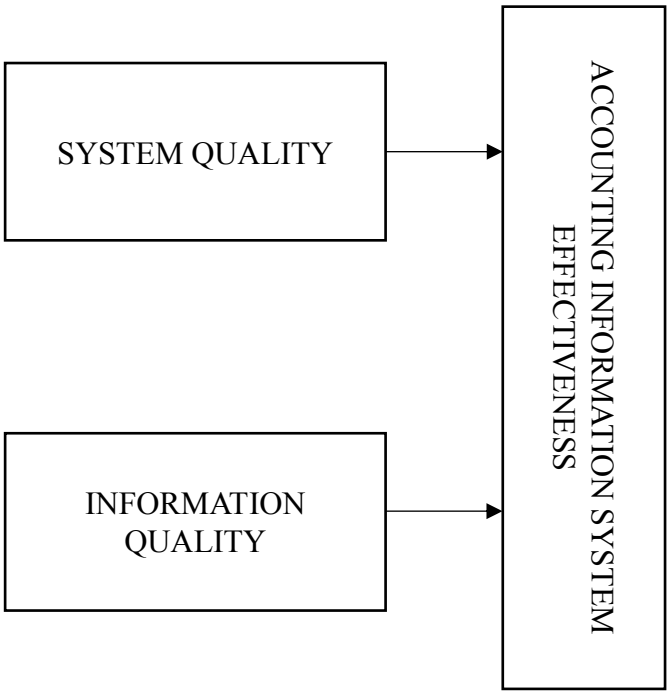


**Figure 1: Proposed AIS Effectiveness Model**

## 6.1 SYSTEM QUALITY AND AIS EFFECTIVENESS

Previous literature have studied system quality construct in different settings. The construct is regarded as very essential in determining AIS effectiveness. System quality is concerned with the technical aspect of the system in term of meeting the user requirements. It has some commonly used measures such as reliability, flexibility, response time, maintainability (Delone & Mclean, 1992; 2003). This study defines system quality as 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.

Study conducted by Nelson, Todd and Wixom (2005) examined the impact of system quality in an IS environment, used reliability, flexibility, accessibility, integration and response time as the determinants of system quality. Interestingly, all the determinants with the exception of responses time were found to have significant influence with system quality. Similarly, Jingjun, Benbasat and Cenfetelli (2013) explored the impact of system quality, service quality and information quality on adoption of website, using 3Q model (integrated model of technology usage by Wixom and Todd's). It was found that system quality influences information quality as well as service quality in e-service context.

In contrast with the model used by Jingjun et al. (2013), Delone and Mclean's IS success model was adapted by Quintero, Pedroche, and Ramos (2009), the study revealed that there is significant relationship between system quality and the decision making of the user. In addition, Ali and Younes (2013) examined the impact of IS on user performance by integrating Task Technology Fit (TTF) model, Technology Acceptance Model (TAM) and

Delone and Mclean model. The result indicated that system quality has significant influence on organizational performance directly and indirectly. Moreover, of all the measures of system quality integration and reliability are found to be the most important factors that contribute to user performance significantly within an organization. Furthermore, Ching-Sheng, Su-Yueh and Yi-Ting (2012) study found that system quality have positive influence on IS performance.

Determining the effectiveness of e-learning systems in Taiwan Universities, Ming-Lang, Ru-Jen, and Hui-Ping (2011) found that system quality has significant effect on e-learning effectiveness. Also, Negash, Ryan and Igbaria (2003) found positive relationship between system quality and Web based customer support system. In a related study, Hien et al. (2014) found that system quality has significant relationship with IS effectiveness in Lac Hong University. Similarly, study by Hyung and Jae (2010) evaluated the end user satisfaction of Campus Wide Information System (CWIS) effectiveness in Korean university. The results of the study indicated that system quality significantly influenced user satisfaction. In an attempt to examine the post implementation success of ERP system in organizations, Yan et al. (2010) found that system quality has significant influence on the post implementation success of ERP in an organization.

In contrast to the above studies, which focused in the universities and other organizations, Sajady et al. (2008) evaluated the effectiveness of AIS in Tehran Stock Exchange. The results indicated that the use of AIS enhances decision making, internal control and quality of the report produced. The study further indicated significant improvement in transaction process while relationship between implementation of AIS and improvement in organizational performance could not be found. However, the respondents of the study were inappropriately determined because only managers were used while other important stakeholders such as CIO and accountants, who have better knowledge of how the system's function were not included. This might be the reason for none existence of relationship between AIS and performance improvement in the study. Similarly, analysing 386 valid responses from Jordanian banks, Shatat et al. (2013) found positive and significant relationship between systems quality and BI effectiveness. On the same note, Bach et al. (2011) findings revealed significant relationship between system quality and AIS effectiveness. In light with the inconsistency of findings above and limited literature on AIS in banks, we proposed;

***P1***: System Quality is positively related to AIS effectiveness

## 6.2 INFORMATION QUALITY AND AIS EFFECTIVENESS

Information system has been one of the important construct in determining AIS effectiveness in an organization. Prior research have indicated that the effects of information quality on AIS effectiveness provides a strong argument that producing qualitative information improve decision making process in organizations and thereby leading to the AIS effectiveness (Corina & Nicolae, 2012). Information quality refers to the quality of the output produce by the system and have some commonly used measures such as completeness, timeliness, accuracy, and relevancy (Delone & Mclean, 1992; 2003). Therefore, this study defines information quality as the ability of the system to provide timely, accurate, relevant, and complete information to user for effective decision making. However, previous study have explored on the relationship between information quality and AIS effectiveness in different contexts.

Ali and Younes (2013) study integrated three theoretical model of information system. The result of the study indicated that information quality has positive correlation with organizational performance. The study further revealed completeness and timeliness as the most important characteristics of information quality. The authors concluded that organizations must treat information as strategic assets and most implement strategies that would improve information quality.

In addition, Nelson et al. (2005) examined the influence of information quality on the effectiveness of IS in data warehouse by considering five dimensions as the determinants of information quality. Using a sample of 465 users across seven different organizations, the results of the study indicated significant relationship between completeness, accuracy and format with information quality, which lead to the effectiveness of IS but no relationship was found with occurrence dimension. Similarly, study by Mouzhi and Helfert (2013) focused on the effects of information qualities on the decision making of a firm using a laboratory experiment. The results revealed that information accuracy and completeness significantly affect the decision quality. They further stated that high quality information increases productivity and enhanced decision making in organizations. Nonetheless, the significant findings documented in the above studies, it can be observed that the studies are fragmented and inconsistent thus making generalization difficult.

Moreover, Wongsim and Gao (2011) investigated the influence of information system quality in AIS adopted environment. Data collected were analysed using content analysis, pattern matching and cross case synthesis. The results of the study revealed that information quality dimension in AIS provide information to managers for decision making in organizations. The study suggested that information quality should be considered as an important factor in order to have an effective AIS. Also, Rahayu (2012) found data quality to have significant influence on the quality of AIS in organisations. In addition, Stefanoul and Athanasaki (2012) concluded that effective ERP system enhance the quality of management reports in organizations. However, these stream of literature might be bias because it considered information quality as unidimensional construct thus prone to generalization issues.

Study by Negash et al. (2003), collected a survey response of 726 from 22 different Universities in order to examine the quality and effectiveness in Web based customer support system effectiveness. The results of their study indicated positive relationship between information quality and system effectiveness. More recently, evaluating key determinants of IS effectiveness in Lac Hong university, Hien et al. (2014) found that information reliability which, is one of the dimension of information quality has a strong correlation with IS effectiveness. Bach et al. (2011) documented that information quality has significant influence on AIS effectiveness within an organization.

Similarly, Shatat et al. (2013) tried to determine IS success factors in Jordan. It was found that information quality positively influences BI system effectiveness in banks. Unfortunately, the study focuses on BI and not AIS effectiveness. Unlike, Shatat et al. (2013) who studied BI, Alzoubi (2011) studied the relationship between information quality AIS in an ERP adopted environment. The findings revealed significant relationship between information quality and AIS effectiveness. He further stated that, the integration of AIS have led to significant improvement in the quality of information produce by the banks. In a closely related study, Ikem, Chidi and Titus (2014), and Ige and Odetayo (2014) found positive and significant relationship between information quality and bank IS effectiveness. The authors stated that the higher the quality of information the more effective organization

will be. In support of these, Amiri and Salari (2012) indicated significant relationship between the quality of information produced and AIS in organizations. Therefore, based on the literature reviewed above, it can be concluded that very few studies focused on banks. These studies either focused on IS in general or other IS related applications and not AIS. In of this, the next proposition is thus,

***P2***: Information Quality is positively related to AIS effectiveness

## 7.0 CONCLUSION

Banks in Nigeria have invested heavily in AIS in order to enhance their daily operations. However, evidence from literature claimed that such investment does not yield the expected benefits because of persistent failure of the system, system error and production of inaccurate information which affect the decision making processes. Therefore, this paper proposed examination on the influence of system quality and information quality on AIS effectiveness. In the course of doing that, conceptual discussion on the impact of system quality and information quality on AIS effectiveness was presented, in which Delone and Mclean success Model was adopted as an underpinning theory that support the conceptual framework. The framework is developed after reviewing existing relevant literature. Our proposed model consists of two independent variables namely; system quality and information quality. The variables will be tested empirically in the future in order to validate these factors. It can be concluded that the findings of this study would assist banks management in understanding the determinants of AIS effectiveness, thereby enhancing their operational activities and decision making.

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