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### **Internal Control Quality**

Internal control quality has been perceived as an important determinant of AIS effectiveness (Ogah, 2013; Teo et al., 2003). Internal control quality refers to all the mechanisms adopted by the banks to safeguards, evaluate the accuracy, and reliability of its accounting information system which enhances the operational efficiency of the banks. Thus, quality internal control enables banks to produce accurate and reliable information for effective decision making at both operational, strategic, and managerial levels in the organization. However, the threats of AIS are increasing in today's dynamic business environment (Rajeshwaran & Gunawardana, 2013) which brought about many challenges particularly in internal control effectiveness which is normally related to fraud (Ekwueme et al., 2012). The complex nature of business transactions implies that AIS face threats of being manipulated to manage activities that are contrary to the assumptions of the real world (Acklesh et al., 2013). They further stated that this situation might have adverse effects on the relationship between internal control quality and AIS effectiveness. Moreover, unauthorized access to data by both employees and hackers, poor segregation of AIS duties and accidental data entry are some of the inherent problems in AIS environment (Rajeshwaran & Gunawardana, 2013). To this effect, AIS needs to be part of the dynamic nature of the environment and be able to detect possible threats of irregularities. Given the above argument, Stefanoul (2012) contended that inadequate internal control quality affects AIS effectiveness in organizations. On the other hand, Hall (2010) stated that a good internal control structure could protect the IS from problems such as fraud, error, and issues related to system failure. 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 within the organizations. Nonetheless, Teru and Hla (2015) argued that the qualitative characteristics of AIS could be maintained with an effective internal control system within the organization. Therefore, having adequate control environment and control activities will prevent undesirable practices in business which may lead to the achievement of organizational objectives. Thus, it is hypothesized that:

**H1:** There is a positive relationship between internal control quality and AIS effectiveness.

## **Training**

Training refers to the extent to which employees' skills and knowledge acquisition programs assist them to understand how important the system is, and how it relates to their works and other functional areas within the organization to contribute to the effectiveness of the system. Elnaga and Imran (2013) defined training as the program that provides employees with information, new skills or professional development. Regular training of the employees enhances their understanding of the system thereby enabling them to achieve organizational objectives (Coman & Coman, 2013).

However, insufficient training may have serious consequences for AIS effectiveness including a reduction in accounting information and internal control quality. Thus, resulting in poor quality information for management functions of resources allocation and reporting work in progress (Drum et al., 2017). Thong et al. (1993) pointed out that issues regarding system technical know-how, perceived difficulty, and poor output can be addressed through a qualitative training of the workers because it is a natural and reliable response to these challenges. Training is a systematic effort made by banks to increase or developed their employee's attitudes and skills toward AIS application so they can perform their job effectively. Training is one of the pervasive ways of enhancing employees' productivity and communicating organizational goals (Gupta, Bostrom, & Hober, 2010). Therefore, it can be concluded that training has a considerable influence on employees' performance which eventually affects the organization in general.

Nonetheless, developing countries like Nigeria have failed to achieve the desired benefit of AIS due to inadequate training of the employees'

(Ahmed & Mhamed, 2014; Ajami & Bertiani, 2012). Due to the fear of embarrassment user(s) of AIS tend not to discuss the issues they are facing either procedurally or technically, as such they do what seems most logical at the moment (Drum et al., 2017). Inadequate training of IS system users' leads to longer implementation period, adaptation difficulty and increase frustration (Vaughan, 2001). Bhatti (2005) contended that one of the reasons for training is to make the employee familiar with the AIS and to increase the understanding level, and expertise of the system. On the contrary, inadequate training would have an adverse effect on quality of information produced thereby causing a delay in decision making in the organization (Raza, 2014). It can be concluded that adequate training of the employees would enable them to understand the system properly which might result in the realization of the expected benefit of the system, thereby solving the problem of systems. Thus, it is hypothesized that:

**H2:** There is a positive relationship between training and AIS effectiveness.

### **Top Management Support**

Top management support has been widely believed to be a key determinant of AIS effectiveness in the literature. Top management support is important for the success of IS project based on the fact that they provide the needed resources, which facilitates proper integration and implementation of the project and gives appropriate guidance to the project manager (Marnewick & Labuschagne, 2011). Top management support concerns the extent to which bank managers provide funds, guidance, and other resources needed before and after implementation of the AIS system. In line with this, Ifinedo (2008) refers to the term as the degree to which managers in organizations provide authority, direction, and resources during and after acquisitions of IS.

Top management support monitors the entire implementation process and enables resource distribution, and is considered as a prerequisite for AIS success in organizations (Wang & Chen, 2006). Management is required to show full commitment to the implementation of the AIS and make decisions relating to the system while delegating specific responsibilities regarding system implementation (Yap et al., 1992). Given this, Chalu (2012) stated that lack of management support would be a critical barrier

to AIS effectiveness. Chalu further maintained that management support includes the provision of enabling environment and facilities where AIS can operate efficiently as well as allocating all the necessary resources. In this regard, Salman and Amusa (2011) claimed that for banks to be able to meet the current IS challenges, fulfilled its customer needs, and survive the dynamics of the business environment. They emphasized the need for bank management to provide the enabling environment to their managers and other personnel, in a manner that AIS can be utilized effectively. Also, Agwu et al. (2014) argued that lack of adequate in-house resources to support and maintain the system leads to system failure. Therefore, when managers providing all the required resources to support AIS, would lead to the success of the system and which eventual results to realizing the full potential of their investment. Thus, it is hypothesized that:

**H3:** there is a positive relationship between top management support and AIS effectiveness.

## UNDERPINNING THEORY AND RESEARCH MODEL

The Resource based view (RBV) is used as the underpinning theory of this study. The main assumption of the RBV theory is that competitive advantage of an organization is determined by their owned resources. A resource means a rare and inimitable organizational asset that creates additional value to the operational efficiency and effectiveness of an organization (Barney, 1991). Barney further stated that organizations that have valuable, unique, imperfectly imitable, and non-substitutable resources are more likely to gain sustainable competitive advantages. Given this, Wade and Hulland (2004) claimed that AIS is one of the organizational core resources that is valuable and cannot be totally imitable. Thus, AIS can be said to a valuable resource that can be combined with other internal organizational capabilities (such as internal control quality, training, and top management support) to generate sustainable competitive advantages. This will enable organizations to implement strategies that enhance their operational efficiency and effectiveness, which can eventually lead to AIS effectiveness. In line with this argument, Bhatt and Grover (2005) concluded that the value of the organizational resource (AIS effectiveness) could increase with the existence of other complementary resources (internal control quality, training, and

top management support) because it would be difficult for competitors to imitate the total effect. To successfully determine the competitive implication of AIS, one should include non-IS determinants especially those resources that have the potential of improving business processes of the organizations (Jeffers, Muhanna, & Nault, 2008). Therefore, organizations that have valuable, rare, and inimitable AIS and are able to complement it with other internal organizational capabilities such as internal control quality, training, and top management support can realize the full potential of AIS thereby addressing the problem of internal processing capabilities.

### Research Model

The research model of the study as in Figure 1 is developed based on previous studies. The framework of this study consists of three independent variables (internal control quality, training, and top management support) and one dependent variable (AIS effectiveness).

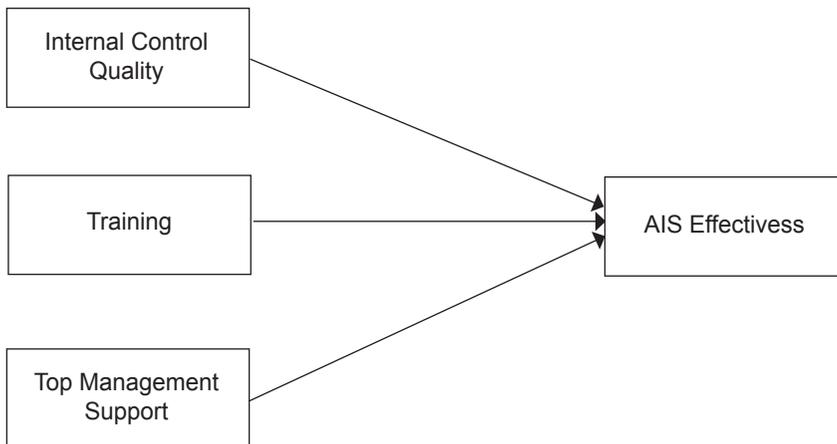


Figure 1: Theoretical Framework

## METHODOLOGY

### Sampling and Data Collection

A probability random sampling technique was adopted in the current study. A total of 571 questionnaires were distributed among bank branches

within the three geo-political zones (North, Central, South) of Nigeria using a self-administered questionnaire. The questionnaire of this study consists of two sections. Section one contains items that measure the individual latent construct of the current study. Whereas section two of the instrument collected the demographic information of the respondents, the sample selected were bank branch managers and head of IT. A total of 287 questionnaires was collected while 11 were incomplete. Thus, the valid response rate was 48.4%.

The first step was to analyze the descriptive data of the respondents to obtain information about their characteristics. The result of the analysis revealed that 16.1% of the respondents were below the age of 30, 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. The analysis further indicates that the majority of the respondents under the gender category are male which constitutes about 85.9% and the remaining 14.1% were female. Of the respondents, 3.6% had a diploma, 55.5% had a degree, and while 40.2 and 70% had Masters and PhD respectively. This suggests that a significant number of the respondents are educated hence they are in an appropriate position to answer the survey instrument. Also, 28.4% of the respondents are regional/branch managers, 29.5% are head of IT unit of the banks and others constitutes about 42.1 percent. This implies that the targeted respondents completed more than half of the survey instruments.

### **Data Analysis**

This study aimed to investigate the relationship between the endogenous and exogenous variables. As such Smart PLS version 2 was used to conduct the study analysis, unlike other analysis tools in which many separate analysis must be executed. The robustness of PLS enables a test of several relationships instantaneously. Thus, it produces valid and reliable conclusions better than covariance based analysis technique (Ringle, Wende, & Will, 2005). The PLS-SEM is an appropriate analytical technique for model prediction (Hair, Ringle, & Sarstedt, 2011), thus it was used in this study. Therefore, a two step analytical procedure was followed to analyze the data whereby the assessment of the measurement model was first carried out and then followed by the structural model.

## Measurement Model

Composite reliability (CR), Average variance explained (AVE), and factor loadings were used to assess the internal consistency based on the procedure suggested by Hair, Black, Babin, and Anderson (2010). Convergent validity is the degree to which the items that are an indicator of a particular construct agree in measuring a particular concept. The factor loading of all the items and the AVE are above 0.5, and the CR values are more than 0.7 as depicted in Table 1 below, which is considered acceptable based on the Hair et al. (2010) benchmark.

**Table 1: Measurement Model Results**

Constructs	Items	Loadings	Composite Reliability	Average Variance Extracted (AVE)
Accounting Information System Effectiveness	AISE2	.748	.777	.537
	AISE3	.693		
	AISE7	.756		
Internal Control Quality	INC4	.744	.815	.525
	INC5	.741		
	INC6	.717		
	INC7	.695		
Training	TR1	.769	.835	.560
	TR3	.793		
	TR4	.701		
	TR5	.726		
Top Management Support	TMG1	.835	.885	.658
	TMG2	.769		
	TMG3	.861		
	TMG4	.778		

The study further assessed discriminant validity which is the extent of how indicators truly represent a construct and how they are distinct from another construct (Hair et al., 2010). The square root of AVE value for each construct should be greater than its correlations with all the constructs (Fornell & Larcker, 1981). Table 2 depicts that the square root of the constructs' AVE and above the value of the correlations of the respective construct with all the other constructs. Therefore, the study has satisfied the requirement for discriminant validity.

**Table 2: Discriminant Validity**

Constructs	1	2	3	4
AISEF	.733			
Internal Control Quality	.414	.725		
Top Management Support	.200	.334	.811	
Training	.372	.450	.316	.748

### Assessment of the Structural Model

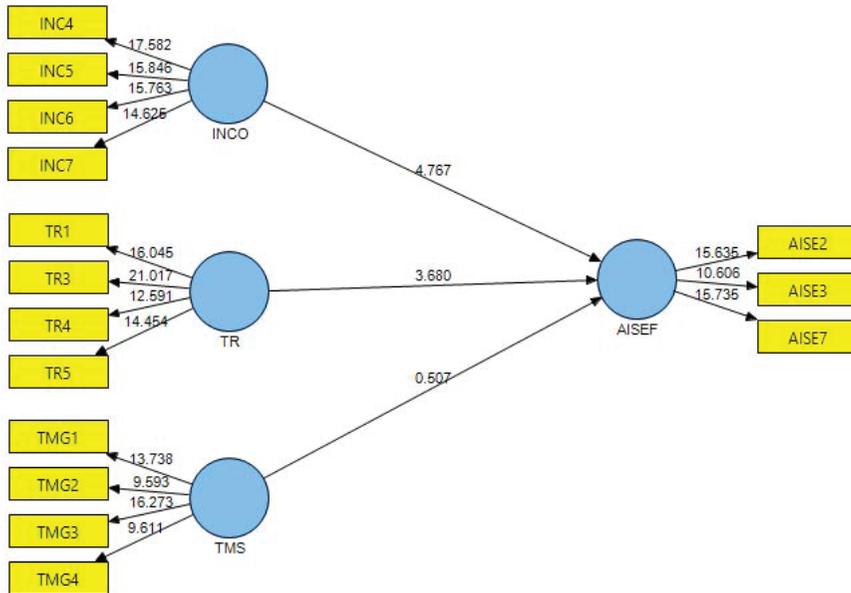
The structural model represents the relationship between constructs that were hypothesized in the research framework. Table 3 and Figure 2 indicates the results of the structural model.

**Table 3: Result of the Hypothesis**

Relationships	Path values	t-statistic	P value	Decisions
Internal control quality -> AISEF	.302	4.767	.000***	Supported
Top management support -> AISEF	.027	.507	.306	Not supported
Training -> AISEF	.228	3.680	.000***	Supported

Note: Significant at: \* $p < 0.05$  level; \*\*  $p < 0.01$  level; \*\*\* $p < 0.001$  level

The significant paths of the study model are presented in Figure 3. The figure revealed that all the hypotheses of the study with the exception H3 are positive and significantly related thus, supported.



**Figure 2: Structural Model**

As presented in Table 3 and Figure 2, internal control quality positively influences AIS effectiveness ( $\beta = .302, p < .01$ ). Thus hypothesis 1 is supported. It is clear that once there is quality internal control errors can easily be detected, and fraud be prevented which will significantly affect AIS effectiveness. Training was found to be statistically significant to AIS effectiveness ( $\beta = .228, p < .01$ ), thus supporting hypothesis 2. Obviously, when AIS user(s) have the necessary skills and knowledge of the system, it would increase their operational efficiency and effectiveness, which eventually leads to AIS effectiveness. Top management support ( $\beta = .027, p > .01$ ) was hypothesized to be positively related to AIS effectiveness, but the finding indicates an insignificant relationship with AIS effectiveness. Thus hypothesis 3 was not supported.

Moreover, evaluation of the research model predictive relevance ( $Q^2$ ) was carried out using the Blindfolding procedure in PLS. The predictive relevance measures the extent of how well the exogenous latent variables in this study have a predictive relevance to the endogenous variable. Table 4 presents the result of the blindfolding, a model with  $Q^2$  greater than 0 means the model has predictive relevance (Chin, 1998).

**Table 4: Blindfolding Result**

	SSO	SSE	1-SSE/SSO
<b>AIS Effectiveness</b>	771	693.479	.100

The blindfolding result as in Table 4 revealed that the  $Q^2$  value is 0.100 which indicated that the model of the study has a medium predictive relevance based on Chin (1998) criteria.

## DISCUSSION

The purpose of this study was to investigate the influence of intra-organizational factors (internal control quality, training, and top management support) on AIS effectiveness in the Nigerian banking sector. The results of this study indicate that AIS effectiveness is positively associated with the internal control quality. The findings revealed that the adequacy of internal control mechanism adopted by banks had played an important role in system effectiveness. The positive relationship between internal control quality and AIS effectiveness is consistent with assumptions in previous studies. For example; Abdelhak and Dalel (2009) stated that internal control quality has a significant influence on the security of the banks which eventually leads to the effectiveness of AIS. The findings of the current study provide convincing evidence that quality internal control guaranty security and control of data transfer both within and outside the bank. Furthermore, it prevents data spying and piracy issues which would enable the bank to maintain its competitive position. In addition to safeguarding against internal and external threats for the banks, the user(s) of AIS believe it ensures proper data entry and processing procedures are followed which improve the reliability of the output (information quality) thereby facilitating effective decision-making at both operational, managerial, and strategic levels of the banks. In line with this finding, Teru and Hla (2015) argued that the qualitative characteristics of AIS could be maintained with an effective internal control system within the organization. The effectiveness of internal control in the banks reduces the level of fraud and other sharp practices which in turn enhances AIS effectiveness (Hayale & Abu-Khadra, 2006). The extent of internal control quality is very important to the effectiveness of AIS, particularly in the context of the Nigerian banks where there are reported cases of e-banking and other related financial fraud. Nonetheless,

the finding of the current study suggests that strength of internal control gives management the opportunity to make corrective actions in the event of any control deficiencies and reduces the impact of the unfavorable event. Theoretically, this study adds to the growing body of literature in the AIS domain by providing empirical evidence on the influence of internal quality and AIS effectiveness. Therefore, for banks to reap the expected benefits of the system they should give more attention to internal control quality because it has proved to be an important construct.

Similarly, the relationship between training and AIS effectiveness was also positive and significant. This finding indicated that high-quality training of AIS user(s) has a significant influence on AIS effectiveness. The training of employees would determine the success or otherwise of AIS implementation in the banks. As banks are facing the risk and problem of in-house technical know-how, given quality training which enhances the knowledge and skills of AIS user(s) will reduce the problem of operational inefficiency and effectiveness of the banks. This finding provides support for prior researchers emphasizing the need for training as an influential factor in the success of AIS (Thong et al., 1993; Vaughan, 2001). Similarly, Dehghanzade, Moradi, and Raghieb (2011) claimed that adequate training courses for employees would significantly increase AIS effectiveness in organizations. Also, Karikari, Boateng, and Ocansey (2015) found that there is a significant relationship between training quality and AIS effectiveness. Since training has been considered as a pervasive way of improving employee's productivity which consequently influences AIS effectiveness, organizing regular training by banks has become strategically necessary so that user(s) can enhance their understanding of the system (Coman & Coman, 2013). Thus, realizing the expected benefit of the system usage. In support of these findings from a different context, Rondeau, Ragu-Nathan, and Vonderembse (2010) found that end-user training quality has a significant positive relationship with AIS effectiveness among US organizations. In line with these findings, Cho (2007) indicated that strong learning orientation has a positive relationship with IS effectiveness. A well-trained user possesses all the necessary skills needed to operate the system effectively, thus, leading to higher performance. Theoretically, the results of this study extend past literature by indicating the positive relationship between training and AIS effectiveness. Therefore, to increase the effectiveness of AIS banks should invest in end-user training because it has proved to be a critical factor for the success of the systems.

The unexpected result of the insignificant relationship between top management support and AIS effectiveness has other implications. Although previous research has reported consistent positive and significant findings on the relationship between the constructs (e.g., Anggadini, 2015; Chalu 2012; Cho, 2007). Even though the majority of the respondents are managers and IT unit staff of the banks, this finding is hardly surprising given that a significant part of the research instrument was filled by other employees of the bank. Hence, they might perceive the IT unit staff as more important in providing the needed support, for instance, when bank employees have a problem in relation to AIS usage, they normally report to the IT unit which they believe have the adequate knowledge and experience in handling AIS related problems. Thus, they consider top management support as a less important factor for the success of AIS. However, the findings in this study is not in isolation with some past studies, for instance, Ein-Dor, Segev, Blumenthal, and Miller (1984) indicated that there is no relationship between top management support (in terms of financial resources) and AIS effectiveness. Similarly, Srivan and Kaiser (1987) show that there is no relationship between management support and IS effectiveness in organizations. Consistent with this, Thong et al. (1993) indicated that there is no significant relationship between top management support and IS effectiveness. Another possible explanation for the current findings is that user(s) perceived the support given by the top management in relation to AIS effectiveness as not satisfactory. This is especially true when the user(s) demands financial or non-financial support for operational efficiency and effectiveness of the system failed. In other words, the result of this study implies that users of the AIS perceived top management support as less important for the success of the system. Thus, banks should pay more attention to other factors such as the internal control quality and training since they were found to be significant in the success of the system.

## CONCLUSION

Due to inadequate in-house technical processing capability by banks, this study examined the effect of intra-organizational factors on AIS effectiveness. The factors covered in the current study include internal control, training and top management support. Despite the importance of the internal control quality construct in the academic literature, there

is insufficient empirical evidence to assess their significance on AIS effectiveness. Findings of this study revealed that internal control quality and training are the key important organizational resources that could lead to the sustainability of the banks' AIS which might eventually result in the AIS effectiveness. Moreover, based on the findings of the study top management support revealed the insignificant relationship. The study suggests that managers need to pay more attention to the internal control and training construct for them to achieve the desired outcome of the system. Therefore, managers providing all the required resources to support AIS, would lead to the success of the system which would eventually result in realizing the full potential of their investment.

This study is not without some limitations. Firstly, the study focussed on the banking sector. Hence, caution needs to be taken when generalizing the findings to other sectors. The study focussed on examining the influence of the intra-organizational factors; internal control quality, training and top management support and does not include the technical factor such as the the quality of the system. Finally, the study is cross-sectional i.e. data collected were analyzed on single moments. Thus, future studies can expand the scope to other sectors. Future studies may also incorporate technical and other related factors that might lead to the success of the system.

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