Audit Procedures in an Electronic Data Processing Environment: A Study of Selected Audit Firms in Nigeria

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Abstract
Technology has continued to advance and businesses have become more sophisticated. Many business processes which were done manually are now automated and processed using computers. Accounting has not been left behind as many organizations now process their accounting information electronically, consequently auditing in such organizations has to be done electronically. This paper examined the audit procedures in an electronic data processing environment as has to do with audit planning, risk assessment and testing. Auditors must audit through and with the computer instead of merely auditing around the computer. It was concluded that the objectives of the auditor in an EDP audit remains the same as in a manual audit but there is a need for specialization as the auditor's ability to audit in an electronic data processing environment is a function of his technical-know-how.

Keywords: *Electronic Data Processing, Auditing, Computer, Accounting, Information Technology*

1.0 Introduction

Computers have now been widely accepted as a vital tool for processing business data. Since computers are now more readily available, affordable and easy-to-use than ever and due to the nature and complexities of today's business environments, more and more businesses have embraced the computer as a tool for collection and manipulation of items of data to produce meaningful information for their businesses.
Many administrative and accounting functions that were previously carried out manually are now carried out more efficiently with the use of computers. Electronic data processing (EDP) as the name implies, is the use of automated methods especially computers to process commercial data.

Since accounting involves the recording, analyzing, processing and interpretation of financial data, the accounting field has not been left out as computers have been increasingly used to increase work efficiency of accountants. In response, auditors have followed suit as manual audits can no longer be effectively used in an electronic data processing environment.
Auditing is the process of objectively examining and evaluating financial statements of a firm to ensure that the records fairly and truly represent the business dealings they claim to denote. An auditor's primary objective is to opine on an entity's financial statements, whether in all material respects they are prepared in harmony with the relevant financial reporting structure (Adeniyi, 2012). Auditing in an electronic data processing environment does not however change the function of an audit, instead the auditor who has now also become a computer

expert makes use of certain tools, softwares and CAATs which aid his job in an electronic data environment to give an independent opinion on the extent to which the financial statement of an entity represents its true and fair position.
Audit procedures refer to the strategy adopted by the auditor in assessing the completeness, accuracy and validity of financial statements. It is the process through which audit evidence is gathered. This process might include observation, inspection, recalculation, reperformance, confirmation and other analytical procedures that enable the auditor form an independent opinion.

Auditing in an Electronic data processing environment maintains the key stages as auditing in a manual system. The approach adopted by the auditor in an electronic data processing environment includes audit planning, risk assessment and testing.
The under listed hypotheses were subjected to test in this research paper:
H_0: EDP does not significantly affect audit planning
H_0: EDP has no significant consequence on audit risk assessment
H_0: Audit testing is not significantly affected by EDP

2.0 Theoretical Framework

The systems theory and the agency theory were used to explain the relationship between audit procedures and the electronic data processing environment.
Bertalanffy (1968) proposed a theory popularly referred to as the Systems theory. A system can be described as an entity having correlated and inter-reliant parts. An alteration in one part of the system impacts other factions and the entire system. The extent to which a system is well adjusted with its environment would determine the extent to which a system could be adapted and grow positively.

Accounting and auditing can thus be seen as two different systems in an entity's business, the result of one affecting the other. A change in how accounting data is processed by the use of computers has consequently led to a shift in how auditing in such an environment would be performed. Auditing techniques themselves are well suited to be computerized. Even though the computer would not express an opinion for the auditor, like we have in managerial decision making, computers can be used extensively to factualize.
The agency theory explicates the business correlation amid agents and principals. In business, the greatest conventional agency correlation exists amid agents in form of company executives and principals in the form of shareholders.

As observed by Gaturu and Ngahu (2015), agents have been alleged to act in their own interest rather than on the behalf of the principal. This has metamorphosed to mistrust between the two parties, particularly from the shareholders. Consequently the principal has increased the monitoring of the agents' activities. This is the bedrock upon which the modern day auditing profession lies.
Auditing has now become a statutory and compulsory assignment that must be carried on business entities to protect the interest of shareholders as well as other stakeholders who may rely on the financial statements of such business entities for their economic decision making.

2.1 Empirical Framework

Several researches have been carried out to determine the relationship that exists between audit procedures and electronic data processing. Arne (1969) found out that if auditors must serve their clients and safeguard third parties, they must dedicate a considerably large percentage of their time to the educational development concerning EDP systems. This is in

line with Sampson and Owusu (2013) who argued that for auditors to thrive in an electronic data processing environment, they must not only be accounting experts but have in-depth knowledge of computers as well as proficient in testing high-level technological controls themselves to minimize possibility of misstated audit report.

Gaturu and Ngahu (2015) argued that computer audits using CAATs and proper internal controls are tantamount to identifying errors and financial misappropriations in a company's accounts. Yang, Lin, and Koo (2011) concluded that the extent to which computerized internal controls can be adapted has a substantial impact on the effectiveness and efficiency of internal control as well as performance of Taiwanese companies.
Moorthy, Seetharaman, Mohamed, Gopalan and San (2011) in a study of the impact of information technology on internal auditing discovered that the proper use of technological tools in auditing is paramount to the attainment of an audit engagement, but is only a fore step to accepting the modifications technology is effecting in business and auditing as a profession. They stated that developing technology will unceasingly vary the nature and methodology to business controls, and thus audit methods and procedures must vary consequently.

Ohonba (2015) conducted a study on the relevance of auditing in a computerized accounting system and drew a conclusion that computerized accounting offers several more benefits than manual accounting even though the functions of manual accounting as well as manual auditing may never go away completely.

2.2 Conceptual Framework

In any engagement, the primary role of the auditor is to examine the truth and fairness status of an entity's financial statements as prepared by a professional accountant with a view of expressing an independent opinion. The auditing procedures in an Electronic data processing environment includes audit planning, risk assessment, audit testing and is achievable by auditing with the computer, auditing through the computer and auditing around the computer.

2.2.1 Planning

Planning an audit entails ascertaining the total strategy to be followed for the audit engagement. It is essential that the auditor adequately plans the audit as it is of tremendous benefits. In considering the overall audit strategy, ISA 300 obliges that the consequence of Information Technology on the audit procedures, including the obtainability of data and the anticipated use of CAATs be considered by the auditor.

2.2.2 Risk Assessment

The auditor needs to understand its client's business environment as this would help the auditor in evaluating the possibilities of misstated material items. In a bid to understand the firm and its business environs, the auditor must understand the firm's information system as well as the related business processes relevant to financial reporting and communication. IAS 315 clearly defines an entity's information system to consist of infrastructure (physical and hardware components), software, people, procedures and data.
The information system relevant to financial reporting objectives is one which is made up of processes that initiate record, process and report firm's transactions and ensures that related assets, liabilities and equity are properly accounted for. The ability of management to make proper decisions in the control and management of a firm's activities and to prepare reliable financial reports is determined by the quality of information generated by the system.

2.2.3 Testing

The auditor has a charge to plan and device responses to the possibilities of misstated material items as pointed out by IAS 315. This is usually done by using substantive and compliance tests. The use of CAATs would enable the auditor carry out more extensive testing of electronically processed transactions. ISA 330 requires that the auditor plans and executes additional audit procedures, the timing, nature and extent of which would be dependent and responsive to the risks of material misstatement already assessed.

2.2.4 Auditing Around the Computer

Auditing around the computer involves the traditional audit process where the computerized equipment is completely ignored as though it doesn't exist. Here, the computer is seen and treated by the auditors as a black box (Millichamp, 1998). The auditors depend on the physical inputs to and outputs from the computer and do not directly examine the process through which output is produced inside the computer.

2.2.5 Auditing Through the Computer

In auditing through the computer, the computer itself is used to test controls as well as transactions. Assurance of the computer process is obtained by the auditor through a direct examination of the processing procedures that take place within the computer. This approach requires adequate computer knowledge and skills and is often facilitated by the use of CAATs.

2.2.6 Auditing With the Computer

Auditing with the computer involves directly evaluating the computer processes, software as well as hardware. This approach is characterized by the use of audit facilities such as Integrated Testing Facilities (ITF) and System Control and Review File (SCARF).

ITF integrates dummy records within the clients application file. During the audit test, the result of processing data is posted to the dummy records and printed out for the auditor's subsequent review.

In the use of SCARF, the accounting application of the client is integrated together with the computer audit program in such a way that every data processing is spontaneously and simultaneously scrutinized by the program. It reduces the loss of audit trail. (Olowokere, 2003)

In summary, auditing in an electronic data processing environment would require that auditors plan their audit, access the risk of material misstatements and test the system to gather audit evidence upon which independent opinion would be formed. To achieve this, the auditor would audit around the computer, audit through the computer and audit with the computer.

3.0 Methodology

For the purpose of this study, the descriptive research design was employed. The study sought the opinions of sampled respondents (selected audit firms in Nigeria) on electronic data processing audit and audit procedures. Through the use of questionnaires as a research instrument, data pertinent to all the study variables were collected using a 5-point likert scale.

4.0 Analysis and Findings

Hypothesis 1:

Electronic data processing has no significant effect on audit planning.

Table X
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674[a]	.455	.386	4.01518

a. Predictors: (Constant), Electronic Data Processing

Table Xa
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	107.527	1	107.527	6.670	.032[b]
	Residual	128.973	8	16.122		
	Total	236.500	9			

a. Dependent Variable: Audit Planning
b. Predictors: (Constant), Electronic Data Processing

Table Xb
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.720	7.001		.246	.812
	Electronic Data Processing	.847	.328	.674	2.583	.032

a. Dependent Variable: Audit Planning

Tables X, Xa and Xb above report the results of regression analysis carried out to test Hypothesis 1. The results show that electronic data processing has a significant effect on audit planning ($b = 0.847$, $p < 0.05$). Therefore, Hypothesis 1 is rejected. Tables xa and xb further report a significant *F* statistic, indicating the model's strong prediction strength ($F = 6.670$, $R^2 = 45.5\%$, $p < 0.05$). The R^2 of 45.5 per cent implies that for every unit change in audit planning, 45.5 per cent of such variation is attributed to electronic data processing.

Hypothesis 2:
Electronic data processing has no significant effect on audit risk assessment.

Table Xc
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.656[a]	.430	.358	3.75788

a. Predictors: (Constant), Electronic Data Processing

Table Xd
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.127	1	85.127	6.028	.040[b]
	Residual	112.973	8	14.122		
	Total	198.100	9			

a. Dependent Variable: Audit Risk Assessment
b. Predictors: (Constant), Electronic Data Processing

Table Xe
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.480	6.552		.989	.352
	Electronic Data Processing	.753	.307	.656	2.455	.040

a. Dependent Variable: Audit Risk Assessment

Tables Xc, Xd and Xe above report the results of regression analysis carried out to test Hypothesis 2. The results show that electronic data processing has a significant effect on audit risk assessment ($b = 0.753$, $p < 0.05$). Therefore, Hypothesis 2 is rejected. Tables Xc and Xd further report a significant *F* statistic, indicating the model's strong prediction strength ($F = 6.028$, $R^2 = 43\%$, $p < 0.05$). The R^2 of 43 per cent implies that for every unit change in audit risk assessment, 43 per cent of such variation is attributed to electronic data processing.

Hypothesis 3:
Electronic data processing has no significant effect on audit testing.

Table Xf
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.678[a]	.459	.392	2.50583

a. Predictors: (Constant), Electronic Data Processing

Table Xg
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.667	1	42.667	6.795	.031[b]
	Residual	50.233	8	6.279		
	Total	92.900	9			

a. Dependent Variable: Audit Testing
b. Predictors: (Constant), Electronic Data Processing

Table Xh
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.700	4.369		2.449	.040
	Electronic Data Processing	.533	.205	.678	2.607	.031

a. Dependent Variable: Audit Testing

Tables Xf, Xg and Xh above report the results of regression analysis carried out to test Hypothesis 3. The results show that electronic data processing has a significant effect on audit testing ($b = 0.533$, $p < 0.05$). Therefore, Hypothesis 3 is rejected. Tables xf and xg further report a significant *F* statistic, indicating the model's strong prediction strength ($F = 6.795$, $R^2 = 45.9\%$, $p < 0.05$). The R^2 of 45.9 per cent implies that for every unit change in audit testing, 45.9 per cent of such variation is attributed to electronic data processing.

5.0 Conclusion

As evident in the results of this study, auditing in an electronic data environment has a significant effect on audit planning, audit risk assessment and audit testing. Auditing in an electronic data processing even though having the same objective as the traditional auditing can be a more complex. The auditor in such an environment has to adapt traditional audit techniques and use them electronically. This by far would depend on the extent of knowledge the auditor has on the system and its programming, hence he might not be able to audit beyond the point of his technical knowledge. However, Computer Assisted Audit Techniques such as the ITFs and SCARFs have been continually employed to perform EDP audits.
Due to the high susceptibility of electronic data processing to loss of audit trail – the basis upon which the traditional auditor draws evidence, it is necessary that a high level of internal control – Application and General controls – be maintained by the client. Computers often referred to as '*Idiot*' machines would only follow the line of programming in processing data (Farradane, 1970). If for any reason there is an error in the programming, any data processed through such erroneous program would always lead to information characterized by errors, hence the popular computer slogan *'Garbage-In-Garbage-Out'.*

For an auditor to achieve his objectives in an EDP audit engagement he must understand the client and its environment; proper planning is essential as the staffing as well as timing required for an EDP audit might differ from that of a traditional audit. The auditor must also access the level of audit risk in expressing an opinion on the client's financial statements. The risk an auditor faces in an EDP environment would significantly be minimized if there are proper application and general controls in the client's firm. The auditor must also perform tests of compliance on the clients internal control system as well as other substantive tests. The audit evidence gathered in performing these tests would form a vital part base upon which the auditor would draw his opinion.

6.0 Recommendations

The study recommends that for an auditor to function properly in an electronic data

processing environment, proper planning, assessment of risk and audit testing around, with and through the computer is paramount. Auditing around the computer by matching input-to-output data would not be sufficient for an Electronic Data Processing environment, the auditor needs audit the process through which the computer process information are derived.
Electronic Data Processing has the potential to improve audit performance as computers can process large amount of data within the shortest possible time frame. EDP audit also allows the auditors perform more compliance and substantive tests through the use of CAATs, however this is a function of the technical knowledge of the auditor, hence it is important that only staff with an in-depth knowledge of computers be used for EDP audit functions.

This study calls for the specialization of accountants. Considering the complexity of today's businesses, there is a need for the auditor who is an accountant to specialize in more specific areas such that Electronic Data Processing Audit becomes a special field and the auditor becomes an expert in this field. The auditor hence not only qualifies as a professional accountant but also as a computer expert. If the auditor is a computer expert, it would become much easier to unravel fraudulent acts by computer operators in an EDP environment as the auditor would be able to reach areas previously limited by his technical knowledge.
In extreme cases where the auditor faces limitation due to his technical knowledge, it is important that a computer expert be engaged alongside the auditor as the use of this expert would be essential for the auditor to form an opinion.

EDP audit is necessitated by a shift to process accounting as well as other administrative data electronically. Accounting software should be programmed in such a way that they can send real time information on questionable events to the auditor. These red flags raised would help the auditor determine what areas he may need to apply more professional skepticism in the course of his engagement.

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