Internal and External Audit Effectiveness in Fraud Detection through Continuous Auditing

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Abstract
In the age of real-time accounting and real-time communication, the current audit practices, while effective, often provide audit results long after fraud and/or errors have occurred. Real-time assurances can assist in preventing intentional or unintentional errors. This can best be achieved through continuous auditing which relies heavily on technology. These technologies are embedded facilities which are crucial to continuous auditing models. Moreover, the recent rash of corporate frauds and malfeasance has intensified the focus on continuous assurance as a viable enterprise risk-management tool. In line with this focus, this study explores the feasibility of implementing continuous assurance as a means of facilitating early detection of fraudulent activities as they occurred. This study adopted a cross-sectional survey design using purposive sampling to ensure that only knowledgeable respondents were chosen. Kruskal-Wallis Rank Test statistical technique which is an extension of the Mann-Whitney U-test was used to analyse the data. The findings suggest that those firms that adopted continuous audit in conjunction with performing certain analytical functions in line with IAS 520 are better positioned to detect fraudulent practices as they occurred.

Keywords: Continuous Auditing, Advanced technology, Detection, Fraud, Immediate alarm.

1. Introduction
With massive corporate failures sending shock waves throughout the stock markets across the globe, the last decade have seen a heightened focus on enterprise-risk management through stronger corporate governance, improved internal-control systems, more transparent corporate reporting, and broadening of the assurance scope to encompass all of these areas. Continuous assurance has accordingly received substantially greater attention as it is increasingly being viewed as a potential tool for helping minimize the risk of corporate fraud—particularly on the scale of what occurred at Enron, WorldCom, and Tyco in US, Oceanic Bank, Intercontinental Bank and Bank PHB to mention a few in Nigeria. Internal audit function as an integral element of the internal controls has been a vital tool for good corporate governance. Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization’s operations (IIA 2012). It helps an organization to accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes. The emphasis is on assisting management in the proper discharge of their duties. To accomplish this, they focus on accountability, internal controls, transparency, probity, equity and management efficiency (Onulaka 2012) Although internal auditors are employees, they are expected to operate within the framework of complete independence. Internal audit examines and evaluates the adequacy and effectiveness of these controls, especially administrative and accounting controls. In addition to the above, Internal Auditors’ roles in an organization include monitoring, assessing and analyzing organizational risk and controls, reviewing and confirming information and compliance with policies, procedures and laws. Working in partnership with management, internal auditors provide the Governing Council or the Board and the Executive management assurance that risks are mitigated and that the organization’s corporate governance is strong and effective (Coserat and Rodda, 2009). The above overlapping functions is a

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confirmation of George; Theofanis and Konstantinos (2015) who succinctly asserted that internal audit is a child of necessity because of the widening gap between management and action points in a large organisation.

In a joint study performed by the Canadian Institute of Chartered Accountants and American Institute of Certified Public Accountants, continuous auditing (CA) was defined as ‘a methodology for issuing audit reports simultaneously with, or a short period of time after, the occurrence of the relevant events’ (CICA/AICPA 1999). Hay; Knechel and Ling (2008) offered a framework from which to explore the development and refinement of a continuous auditing approach. In their methodology, transactional and system data are monitored and analyzed continuously based on a rule-set predefined by the auditors in the continuous audit application. Exceptions to the rules trigger alarms that automatically notify the auditors of potential irregularities. The nature of audit work transcends from primarily a substantive-based test of details approach to a focus on auditing by exception.

A white paper by KPMG (2008) claimed that continuous auditing is the collection of audit evidence and indicators by an internal auditor on information technology (IT) systems, processes, transactions, and controls on a frequent or continuous basis throughout a period. According to this paper, CA efforts can provide organizations with greater audit coverage (i.e., 100 percent of the selected population) for the same or less effort over time—specifically by redesigning the traditional audit approach so it can become repeatable and sustainable and by retooling people, refining processes, and incorporating embedded or enabling technologies. CA allows the internal audit team to virtually identify control breakdowns in real time (allowing action to be taken immediately) by keeping track of specific controls, transactions, and business events as they occur (Woodroof and Searcy, 2001). The use of CA tends to raise the overall profile of internal audit within the organization. By contrast, continuous monitoring is a feedback mechanism used by management to ensure that controls operate as designed and transactions are processed as prescribed. This monitoring method is the responsibility of management and can form an important component of the control structure.

Problem Statement

The advent and proliferation of corporate-wide networks is enabling progressive integration of worldwide manufacturing, inventory keeping, and financial management as well as increasingly informative forms of corporate reporting. Operational requirements for the global organization now allow for worldwide deployment of the production cycle. The world car concept by Ford allows for manufacturing in different countries and delivery of differently configured models (e.g., left-right steering wheel, narrower models for the narrower streets of Europe and high-wheeled model for the African rough roads). On the other hand this creates great coordination and communication needs across these units and creates increased country and supply chain risk.

A pretty classic view of Continuous Audit is that it is one of many tools used by Internal Audit to provide reasonable assurance that the controls in the business operational environment are suitably designed, established and operating as intended. The ‘continuous’ element of the label can refer to the frequency of testing throughout the year as opposed to end of year snapshots.

A more contemporary view is that Continuous Audit is the application of automated tools to provide continuous assurance over financial or operational control and to check whether internal controls are functioning to prevent error and fraud (Dan French 2011). But the world is moving on. Businesses are striving for global standardization, simplification and automation.

The new world requires an approach to audit (and indeed to management) that recognizes the inherent complexity and volume associated with today’s global processes. Major organizations today are looking for a better way to assure their businesses run ‘as advertised’ and to avoid any issues that could cause reputational damage. Despite the wide disparity between definitions, widespread application of Continuous Audit remains elusive. For example, 32% of organizations recently surveyed by the Institute of Internal Audit (IIA) reported
that they perform continuous auditing. In another recent survey by Price Waterhouse Coopers (PWC) 81% of companies ‘aspired to’ continuous auditing.

In spite of the enormity of tasks associated with traditional audit, technological, political, regulatory and economic changes that have occurred during the last decades, have significantly affected basic functions and operations of internal audit departments in many organisations. In this respect, the rise of business risks, the economic instability and the increase in financial scandals across the globe have brought the relevance of annual auditing and its effectiveness to question (Bekiaris et al., 2013; Onulaka, 2015; Vinary and Skaerbaek; 2014; Tsipouridou and Spathis, 2014; Gbadago, 2015; George, Theofanis and Konstantinos, 2015).

Widespread availability of computer networking makes it possible to dramatically increase the frequency of periodic audits by redesigning the auditing architecture around online auditing. For example, if internal (or external) auditors annually perform reconciliations in an audit, these procedures can be “wired into” software and performed every day or after each business cycle and if out-of-balance conditions arise, alarms can be created. Vasarhelyi (2005a) cited by Kuhn and Sutton (2006) provides an examination of the Enron fraud and demonstrates how continuous auditing would have helped detect the fraud surrounding the special-purpose entities (SPEs) that were used to hide debt and prop up a positive outlook presented in the corporate financial statements. However, the continuous audit metrics that would have been most useful in detecting fraud at Enron are fairly specialized metrics that would have addressed a fairly unique fraud issue—and one that was reasonably understood by the auditors a priori to the fall of Enron. WorldCom presents a very different situation, albeit a fraud of very similar magnitude. According to Kuhn and Sutton (2006) in 1999, revenue growth at WorldCom (the then second largest telecommunications company in the U.S.) began to slow quite dramatically, expenses became a steadily increasing percentage of revenue, and accordingly WorldCom’s stock price began to drop. In an effort to meet earnings projections, management effected several fraudulent cost-reducing and revenue-enhancing mechanisms. In spite of recent legislation and reporting trends, such as the Sarbanes-Oxley Act of 2002 (SOX) and initiatives for continuous disclosure of financial information provide greater incentives for the development and use of continuous assurance in the financial reporting environment, several factors have mitigate against the application of continuous auditing using specialized audit software in many organisation in Nigeria. In an effort to enhance auditor performance in fraud risk assessment, Eining et al. (1990) created an expert system and subsequently tested auditor performance with the system against use of a fraud risk-factor checklist or a logic predictive model (Eining et al. 1997). The expert system outperformed both alternative decision aids. This finding is somewhat encouraging from a continuous audit perspective as expert system technology could easily be integrated into a Continuous Assurance Analyzer Components. The Expert System Technology and Continuous Assurance Analyzer if effectively employed can prevent a high tech management fraud in an organization. IAS No. 520, Analytical Procedures, requires auditors to use analytical procedures in planning the nature, timing, and extent of other auditing procedures. It would therefore seem that an appropriate initial step in continuous audit research would be to suggest possible Analytical Procedures that might be applied in a Continuous Audit setting. These Analytical Procedures would be aimed at the detection of errors or anomalies requiring follow up by auditors. It is for this reason that this research is being undertaken to provide answers to the following research questions:

**Research Question**

1. To what extent do auditors both internal and external apply analytical procedures (IAS 520) for fraud detection with the aid of Expert System Technology and Continuous Auditing?

2. To what extent will continuous auditing be difficult to implement because of low level infrastructure and effective communication technology in Nigeria?
2. Literature Review and Development Hypotheses

Today’s auditor is facing numerous challenges and because of high demand for auditor’s input in corporate governance process, auditors are expected to be more involved in the scheme of things and not to wait for errors to occur before raising alarm. The era of looking at internal auditor as only a resident “Watch dog” of the organisation is over. A modern day internal audit encompasses both financial, operation and management audit. Auditors are expected to be looking at existing procedures, identify the inadequacies therein and advise the management and the Board through the appropriate reporting channel. A recent study in Greece by George, Theofunis and Konstantinos (2015) it was found that the above task will not be effectively handled where the required manpower is lacking and where management tactfully excludes internal auditor in some important decision making. Similarly, Achua and Ogunjuboun (2014) in their study on the Imperatives of Value-for-Money Internal Auditing in Nigeria Universities observed that too often, the activities of internal auditing are mere responses to an immediate tactical need. In a rush to implement a response, key strategic issues can be overlooked. The result can be a tactical internal audit function in search of a strategy. This is a major pitfall of Director of Internal Audit (DIA) in some of our tertiary institutions and other government establishments. Internal auditor is often seen as an appendix that does not necessarily need to be included in the strategic plan of the overall structure in the institution. Lack of strategic planning has confined this all-important element of management to the traditional ‘tick-box’ approach. This may explain why Internal Auditors (IAs) in the system are often relegated to the background, neglected or even ignored. Successive studies have shown that internal audit quality is examined as one of the variables associated with internal audit effectiveness (Miheret and Yismaw, 2007). In a study of one of the public sector in Ethiopia, the findings indicate that internal audit effectiveness is affected by the internal audit quality, along with the support of management, the organization environment and the characteristics of the organization. In another research Barac and VanStaden (2009) studied the relationship between the perceived quality of internal audit and the safety of corporate governance structure in South Africa. In contrast to the above, the results indicate that there is no correlation between the corporate governance structures and the perceived quality of internal audit. More recently, examining one hundred and eight Israeli organizations, Cohen and Sayag (2010) also considered the quality of internal audit work as a factor of internal audit effectiveness. Along with the above Alzeban and Gwilliam (2014) emphasize the impact of internal audit quality to internal audit effectiveness. Similarly, Vasarhelyi and Halper (1991) observed that the traditional attestation framework contains inherent flaws hindering timely and relevant assurance reporting. Unlike internal auditor, external auditors typically receive data from clients that present only a “‘snapshot” of the financial reporting system. Their assertion was in agreement with Kuhn and Sutton (2006). The external audit rarely provides information facilitating timely decisions for management, creditors, investors, or auditors. While auditors increasingly work to spread the audit work throughout the year, the bulk of business process and information technology (IT) controls testing, as well as high-level financial analytics, are still conducted during third quarter interim testing prior to the detailed end-of-year substantive-based test procedures. The result is a concentration of activity during a short timeframe, making time very precious. Continuous auditing by internal auditors represents a means to alleviate this time pressure (Kuhn and Sutton, 2006) In a similar study by Woodroof and Searcy (2001) it was observed that Continuous flow of information facilitates the use of time series analyses to create points of reference based on historical data for comparison with current data. In addition, the continuous auditing rule-set can integrate industry norms and trends derived either from internal auditor’s research or information provided by digital agents.

Kuhn and Sutton (2006) in their analysis of the advantages of continuous auditing considered WorldCom’s fraudulent capital expenditures as an example and argued that comparison of historical balances and ratios of operating expenses and capital expenditures in relation to current balances and industry norms would have triggered alarms to auditors. For example, shifts in account balances from operating expenses to capital expenditures, similar to the significant reclassification entries at WorldCom, would automatically trigger alerts to the auditors. That is, WorldCom posted fraudulent entries totaling several billion dollars associated with the MCI merger by writing down assets and transferring costs to goodwill. Analytic monitoring would again identify similar entries with appropriate rule-set configurations that flag the
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simultaneous decrease of assets and increase in goodwill (i.e., balanced entries). On the basis of the above, the first hypothesis will be formulated to test if strict adherence to IAS No. 520, *Analytical Procedures*, will increase the fraud detection rate when continuous audit approach is implemented in an organisation.

**Hypothesis 1:**

There is no significant difference among the three respondents group on the need to use analytical procedures (IAS 520) for fraud detection and subsequent alarm.

In a related study in Ernst & Young Center for Auditing Research and Advanced Technology University of Kansas by Nigrini (2000), the Panel on Audit Effectiveness concluded, amongst other things, that the auditing profession needs to develop new approaches to auditing, including some form of continuous auditing, with a greater emphasis on technology-driven analytical and diagnostic procedures (The Panel on Audit Effectiveness, 2000, p.160). Similarly, study by the Canadian Institute of Chartered Accountants (CICA) on continuous audit report concluded that continuous audits are viable under certain conditions and that automated “alarm triggers” would be needed to signal anomalies and errors. They called for research to show how auditors could effectively use sophisticated automated audit tools (CICA, 1999). This paper suggests two digital analysis based tests that might be used by auditors as a technology driven analytical and diagnostic procedure. The first-two digits test checks whether the first-two digit proportions of the current data matches that of past audited data. The summation test analyzes the totals of the numbers with specified first-two digits to test for the inclusion of high dollar values in the current set that do not match those in the past audited data. A suggestion for future research is for goodness-of-fit tests to assist auditors in concluding whether material errors might have occurred. According to Turley and Zaman (2007) CICA report noted that research was needed to show how auditors could most effectively use sophisticated automated audit tools in continuous audit. They considered Continuous Auditing viable if, amongst others, auditors could be quickly informed of the results of automated procedures, when the process has identified anomalies or errors requiring follow up procedures.

According to Cosserat and Rodda (2009) a continuous audit presents a number of issues. There will be little time for the auditors to gather audit evidence in verifying and substantiating the subject matters concern. They further argued that auditor would have to employ fully automated audit software such IDEA or ALC to read, manipulate and generate the information required. This means other conditions would be necessary as a platform for continuous auditing such as a high level security infrastructure, effective communication technology, prior agreement as to the form and scope of the audit and a sound knowledge by the auditor of the operating system employed by the entity.

In a similar study CICA and the AICPA identified six preconditions that must exist before an organization can implement continuous auditing, namely:

1. A system with suitable characteristics
2. A reliable information system, including primary controls for collecting data on the system
3. An audit or secondary control system that is highly automated
4. Auditor proficiency in information technology and the system
5. Reliable means to obtain the results of the audit procedures
6. Control over the audit process (Nehmer, 2003).

It is now clear that in order for an organization to implement continuous auditing having the 21st century technological infrastructure is of essence. However the costs of implementing the technology needed for a continuous auditing system have to be taken into consideration. The willingness of the organization of implementing continuous auditing in order to have transparency will be a deciding factor for the company to in fact implement continuous auditing. Singleton and Singleton (2005) present a critical analysis of implementing continuous auditing and outlined the following as the pros and cons of implementing continuous auditing to include:

1. Mitigates risks
2. Leverages opportunities inside the system (e.g. evaluating risks internal to the IS)
3. Facilitates internal control objectives
4. Instant access to information
5. Drill-down capability
6. Flexibility in changing elementary types of CAR into full-fledged CAR
7. Integrating internal and external stakeholders
8. Assists external audit

The cons of implementing continuous auditing include:
1. Infrastructure needed—must have information in digital form and access to it (connectivity)
2. Cost (for larger companies)
3. Complexity—new security issues, managing infrastructure, adapting to new procedures
4. IS performance—a real-time, online CAR will reduce the level of performance (processing speed) of the IS as it filters transactions
5. Staff-CAR will work best, like any other IT, if a qualified—champion exists to promote and support its use
6. CAR that is not linked directly to the corporate strategies and business processes
7. Poor design, such as an inappropriate scale and scope of CAR—that is, an improper fit of CAR and the entity

It is on the basis of these assertions that the second hypotheses are being formulated to test the above claim.

**Hypothesis 2:**

There is no significant difference the scoring rates among the three respondents groups that continuous auditing will be difficult to implement because of low level infrastructure and effective communication technology in Nigeria.

Also in a related study Woodroof and Searcy (2001) developed a conceptual model of continuous audit, and as a proof of concept, they designed a demonstration and implementation of continuous audit within the debt covenant compliance domain. According to this study, the demonstrated web application uses digital agents and alarm triggers sent over the internet to continuously monitoring whether actual values of client’s variables are in compliance with standards set out in the debt covenant agreement. The author is positing that the widespread availability of computer networking makes it possible to dramatically increase the frequency of periodic audits by redesigning the traditional auditing architecture around online auditing.

Vasarhelyi and Greenstein (2003) cited by Kayaham (2013) explained that the most significant effect of information technology on businesses is the digitalisation of business processes. According to them, the electronization of business processes created significant efficiency in reducing the cost of supply, tightening of business processes, removing the unnecessary procedures between partners, and physical documentation. Digitalisation lays more emphasis on reduction of paper-based documentation in businesses, the nature, timing and form of audit evidence. Many studies have shown that in the face of the changing audit environment while the demand for traditional auditing is decreasing, the interest in continuous auditing and assurance services is increasing.

Rezaee et al. (2001 and 2002) observed that information technology (IT) such as electronic data interchange (EDI), electronic commerce and the internet have provided business practices in electronic environment. He claimed that such information technologies facilitate the production, presentation and assessment of financial information on a real-time basis and supported the view that real-time financial information must be audited on a real-time basis. Similarly, Coderra (2006) claimed that organizations are continually exposed to errors, frauds or inefficiencies that can result in continual financial loss and increased level of risk. He contended that timely and continuous assessments of risk levels and control systems of firms have great importance over financial data to be continuously reliable. Similarly, Woodroof and Searcy (2001) in their discussion paper contended that audit risks have emerged that cannot be properly addressed by traditional audit methodologies. These risks involve many issues including: (1) paperless transactions that are completed rapidly without human review for reasonableness, (2) progressive Omni-presence of e-business
and processes that are automated, (3) widespread existence of viruses, (4) internetworked processes that serve more than one organization, (5) extensive use of outsourcing, (6) denial of service attacks over the Internet, and (7) businesses that are essentially faceless and multinational. According to Committee on Basic Auditing Concepts of the American Accounting Association (AAA, 1973), auditing is a 'systematic process of objectively obtaining and evaluating evidence of assertions about economic actions and events to ascertain the correspondence between those assertions and established criteria and communicating the results to interested parties'. Continuous auditing is a type of auditing which produces audit results simultaneously, or a short period of time after, the occurrence of relevant events. In continuous auditing, the collection and evaluation of the evidence occurs promptly after the relevant event (Vasarhelyi, et.al, 2006).

In a similar study by KPMG (2008) it was observed that advances in technology have paved the way for increased use of CA/CM. In recent years, many software vendors have developed applications that can analyze significant amounts of data on a frequent basis and provide dashboard reporting and alerts. This technology has given organizations the capability to put the theories of CA/CM into practical use by providing insight into areas of risk and opportunity.

What’s more, management and internal audit efforts to adopt innovative ways of assessing and managing risk and enhancing performance are now more critical than ever. Providing senior management with a “post-mortem” after a problem has occurred is no longer acceptable. The information generated through CA/CM can change where management or the internal auditor focuses its attention and resources. As a result, management and internal audit teams are embracing CA and CM as important efforts that can provide efficient and continuous discipline to monitor important issues on a frequent or real-time basis, resulting in risk events being addressed before issues arise.

Dan French (2011) in a discussion conference paper, it was observed that modern business systems such as ERP present a unified view of a process across plants, divisions and legal entities through a highly standardized process template and interface for the business users. The paper further opined that simplicity hides a complex set of internals, including the elements we rely on for controls. Cosserat and Rodda (2006) holding a similar view asserted that the mechanism for designing and implementing controls are complex in many environments and the permutations of usage are enormous. According to them some years ago the SAP R/3 ERP system had 55 thousand options for executing business transactions, and it is getting more complex as each year and upgrade goes by.

To monitor the integrity of the data, Onions (2003) suggested keystroke level data examination. This basically involves monitoring database utilities and applications for commands which could cause fraud or error. This model addresses the testing of transactions in two ways. Firstly, each transaction is audited and reported on as an isolated entity. This is done “ephemerally” – the transactions are tested at the time of entry. This is referred to as transaction level data examination.

Flowerday, Blundell and Solms (2006) said that this transaction level data examiner ascertains whether each transaction fits the pre-specified rules for that transaction. These may be business rules or even rules dictating what actions are permissible for certain users. This is done in conjunction with performing certain analytical functions. Computer Assisted Audit Tools could be used. However, these operations would need to be performed on the transactions in real-time rather than batch. After the transaction has been examined it may be added to a data mine for possible further examination. Secondly, the transactions are examined as a whole over a longer time period (perhaps even years). This examination looks for patterns in the transactions which could together result in fraud. This is known as the transaction pattern level of data examination. Expert systems and rules based criteria would be employed. Rules would be similar to virus definitions and would be available for different industry types.

The problem when attempting to use expert systems is that each software package available has a different data schema. It would be very costly and time-consuming to create expert systems for each application. The solution would be to create a generic master file and transaction layout which could be used regardless of application data schema. This newly defined generic schema for a transaction would allow one expert system to travel through the data mine. This schema would be defined using eXtensible Continuous
Auditing Language (XCAL) which is similar to (eXtensible Business Reporting Language (XBRL) or eXtensible Markup Language (XML)-based. The model consists of four levels:

1. Transactions and data from various sources are entered for processing.
2. Transactions and keystrokes are mapped to XCAL schemas. This is done in real-time and is captured forensically on a daily basis.
3. Real-time CAATT processing is used to check transactions and keystrokes. Alerts may be sent to an Online Systems Audit Centre (OLSAC). Transactions are stored at this level for a day (but passed to level 4 where they are stored for years).
4. Expert systems look for patterns in the data.

In a study on continuous auditing by Srinivas (2004) it was found that one of the challenges affecting continuous auditing solutions in real-time accounting systems is the varied data formats used. Srinivas (2004) observed that ability to access and retrieve data from a variety of record sources, including legacy systems, is crucial to the creation of a continuous auditing system. This means that data will be in a variety of formats, with different file types and record systems. It becomes necessary to standardize these data. This view is similar to Dan Franch (2011). This can be a complex and expensive venture especially in developing countries the enabling environments are lacking. Even more problematic is the risk of introducing errors such as duplicate records. Technologies such as XBRL go a long way in creating a standard reporting format. Add to this, intelligent technology such as FRAANK (Financial Reporting and Auditing Agent with Net Knowledge) which can convert older reports into XBRL. This can create a way to compare non-XBRL data produced by legacy systems with newer XBRL reports (Kogan et al., 1999). Until XBRL becomes widely implemented, using data marts to collect and assimilate data is an option. Onions (2003) also suggests adding XCAL, which would create a generic master file layout.

3. Method

Research Design

The study adopted a cross sectional survey design. According to Kothari (2004), surveys are concerned with describing, recording, analyzing and interpreting conditions that either exist or existed, opinions that are held, process that are going on or effects that are evident. This was designed to investigate the existence and effect of continuous auditing in 30 internal audit departments out of large, medium and small organisations.

Population Sample Size and Sampling Technique

The population of the study from which the sample was drawn comprised of internal audit departments of both public and private sectors in Nigeria. Purposive sampling was adopted to ensure that only knowledgeable respondents were chosen. A sample consisting of respondents in Lagos and Abuja were considered a good representation of the respondents groups since the ultimate test of a sample design is how well it represents the characteristics of the population it purports to represent (Denscombe, 2003; Ogunbamuru, 2003). Fifty (50) questionnaires were distributed by mail and partly by hand during periodic meetings of Heads of Internal Audit Departments from both Federal, State and Private sector organisations out of which only 38 were returned but 30 were found to be usable. The respondents were required to indicate the extent of their agreement in the list of semantic differential belief statements on the score of 1 to 5. A score of one (1) represented strong disagreement with the statement while a score of (5) five represented strong agreements. This type of scaling was in agreement when items are to be judged on a single dimension and arrayed on a scale with equal interval (Kothari, 2004; Oseni and Ehimi, 2010; Baridam, 2008)

Data Collection

The data collection comprised of both primary and secondary data. The primary data were collected from the responses received from the structured questionnaires while secondary data were collected from
Journals and text books and from the internet. Mail questionnaires to 50 subjects comprising three separate groups namely, large, medium and small organisation with extensive knowledge about auditing practices were used for this study. It was designed to ascertain the respondents’ perceptions about the application of continuous auditing as a measure to reduce fraudulent practices in an organisation.

4. Data Analysis and Interpretation of Results

Descriptive statistical tools used for this research include tables, percentages and frequency distribution while the Kruskal-Wallis Rank Test statistical technique which is an extension of the Mann-Whitney U-test were used because it allows us to compare any number of independent groups rather than only two and it does not require equal sample sizes. It is also appropriate in this data analysis because as a non-parametric test, it is a good procedure for count data in categories or rankings (Kothari, 2004). It can be calculated using the following model:

\[ K = \frac{12}{N(N+1)} \sum \left( \frac{R_i^2}{n_i} \right) - 3(N+1) \]

Where \( N \) = total number of cases in C groups
\( N_i \) = number of cases in a given sample
\( R_i^2 \) = square of the summation of ranks in a given sample

<table>
<thead>
<tr>
<th>Table 1: Response Rate and Demographic of Mail Respondents</th>
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<td>Subject Group and org. size</td>
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<td>Medium</td>
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<td>Small</td>
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<td>Total</td>
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Source: Author’s computation from survey questionnaire

It can be seen in Table 1 that the overall response rate is 60%. But 59% of the respondents are from large organisation, 67% from medium enterprise and the remaining 55% are from small firm. The table also indicates that over 100% of respondents have accounting experience in both organizations and also the relevant accounting qualifications, and all had extensive occupational experience.

<table>
<thead>
<tr>
<th>Table 2 Highest Professional Qualifications of the Respondents</th>
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<td>Professional Qualifications</td>
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<td>Group</td>
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From the above Table, more than 50% of the respondents have a locally recognised accounting qualification from the Institute of Chartered Accountants of Nigeria. This is expected because only few can afford to acquire foreign based internationally recognised qualification like ACCA (UK) and CPA (USA). Below are responses and ranking on key issues from the questionnaire on continuous audit.
Table 3: Krukal Wallis Rank Test for number of fraud and irregularities detected with the adoption of continuous auditing and when continuous auditing approach is not in use

<table>
<thead>
<tr>
<th>S/N</th>
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<th>Group 2</th>
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<td>9</td>
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<tr>
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<td>17</td>
<td>24.5</td>
<td>11</td>
<td>7</td>
<td>8</td>
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<td>13</td>
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<td>7</td>
</tr>
<tr>
<td>10</td>
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<td>10</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>162</td>
<td>217.5</td>
<td>136</td>
<td>146.5</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>N=10</td>
<td>RN₁=217.5</td>
<td>RN₂=146.5</td>
<td>RN₃=100</td>
<td></td>
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</tr>
</tbody>
</table>

Source: Survey Result Computation by the author

Hypothesis 1

There is no significant difference among the three respondents group on the need to use analytical procedures (IAS 520) for fraud detection and subsequent alarm in continuous audit setting because of numerous benefits associated with the new audit approach.

From the data presented in Table 3 above, the null hypothesis can be tested using the following statistical model:

\[ K = \frac{12}{N(N+1)} \sum \left\{ \frac{R^2}{n_1} + \frac{R^2}{n_2} + \frac{R^2}{n_3} \right\} - 3(N+1) \]

\[ K = \frac{12}{30(31)} \left\{ \frac{(217.5)^2}{10_1} + \frac{(146.5)^2}{10_2} + \frac{(100)^2}{10_3} \right\} - 3(31) \]

K = 8.63

Using the critical \( X^2 \) value with C-1 = 2 degree of freedom and corresponding to a 0.05 (\( \alpha = .05 \)) level of significance \( X^2 \) is 5.99. Since \( K = 8.63 > 5.99 \), the null hypothesis is rejected. We can therefore conclude that there is significant difference in the mean scoring rate of the three respondents group on the need for the application of IAS 520.
Table 4: Kruskal Wallis Rank Test on continuous auditing and poor infrastructures and effective communication technology in Nigeria

<table>
<thead>
<tr>
<th>S/N</th>
<th>GROUP 1</th>
<th>GROUP 2</th>
<th>GROUP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obs.</td>
<td>Rank</td>
<td>Obs.</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>R_1</td>
<td>18</td>
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<tr>
<td>2</td>
<td>16</td>
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<td>8</td>
</tr>
<tr>
<td>3</td>
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<td>5</td>
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<tr>
<td>Total</td>
<td>123</td>
<td>189.5</td>
<td>103</td>
</tr>
</tbody>
</table>

N=10 \(R_{N1}\) \(R_{N2}\) \(R_{N3}\)

Source: Survey Result Computation by the author

From the data presented in Table 4 above, the null hypothesis can be tested using the model:

\[
K = \frac{12}{N(N+1)} \sum \frac{R^2}{n_1} + \frac{R^2}{n_2} + \frac{R^2}{n_3} - 3(N+1)
\]

Using the critical \(X^2\) value with \(C-1 = 2\) degree of freedom and corresponding to a 0.05 \((\alpha = .05)\) level of significance \(X^2\) is 5.99. Since \(K = 2.3 < 5.99\), the null hypothesis is accepted. We can therefore conclude that there is no significant difference in the mean scoring rate of the three respondents group on the fact that continuous auditing in Nigeria will be hampered on the basis of poor infrastructures and effective communication technology.

5. Discussion of Result and Conclusion

The identified significant relationships in hypothesis I and 2 are consistent with field result in table 3 and 4 and findings in previous studies. From computed result in hypothesis 1 it can be deduced that continuous auditing will be more effective if the auditor make adequate use of analytical procedure as stated in IAS No. 520 and therefore conclude that there is significant difference in the mean scoring rate of the three respondents group on the need for the application of IAS 520.

For example, after an empirical study by Woodroof and Searcy (2001) it was claimed that audit risks have emerged that cannot be properly addressed by traditional audit methodologies. These risks involve many issues including; (1) paperless transactions that are completed rapidly without human review for reasonableness, (2) progressive omni-presence of e-business and processes that are automated, (3) widespread existence of viruses, (4) internetworked processes that serve more than one organization,(5) extensive use of outsourcing, (6) denial of service attacks over the Internet, and (7) businesses that are essentially faceless and multinational. The finding is also in line with a study in Flowerday, Blundell and Solms (2006) which claimed that this transaction level data examiner ascertains whether each transaction fits the pre-specified rules for that transaction. According to the study, there may be business rules or even rules dictating what actions are permissible for certain users. This is done in conjunction with performing certain analytical functions in line with IAS 520. This view is similar to Dan (2011). This can be a complex and
expensive venture especially in developing countries like Nigeria where the enabling environments are lacking.

This finding has far reaching implications for the auditing/accountancy profession, educational institutions, regulators, and the general public. The level of fraudulent practices in our public sector can be minimized if the ruling government in Nigeria whose target is to stamp out corruption can focus much in improving the infrastructural facilities especially public power supply to create the enabling environment for implementation of Technologies such as XBRL which will go a long way in creating a standard reporting format. Add to this, intelligent technology such as FRAANK (Financial Reporting and Auditing Agent with Net Knowledge) which can convert older reports into XBRL. This can create a way to compare non-XBRL data produced by legacy systems with newer XBRL reports with a view to raising immediate alarm for any abnormality.

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