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Original Research Article Embracing Continuous Auditing for Public Sector in Kenya

ABSTRACT

Aims: The purpose of the study was to assess the changes the government financial system in Kenya has undergone in the recent times and with the aim of proposing a model that could be used to implement continuous auditing by the Public Sector Audit Organization.

Study design: Adoption of existing model and survey using questionnaires.

Place and Duration of Study: Kenya, 2013.

Methodology: The existing continuous auditing models were studied and the Integrated Continuous Auditing, Monitoring and Assurance Conceptual Model was adopted for use. The model was tested using data collected using questionnaires. Data was collected from 100 auditors in the Public Sector Audit Organization. The Audit Command Language software (a Computer Aided Audit Tool) and a database system of a government Ministry were used to demonstrate how data can be obtained directly from a client system.

Results: The study found the need for training in the skills necessary for continuous auditing and the acquisition of Information and Communications Technology resources and infrastructure were necessary in realizing continuous auditing.

Conclusion: The Integrated Continuous Auditing, Monitoring and Assurance Conceptual Mode would offer a good starting point in the implementation of continuous auditing by the Public Sector Audit Organization.

Keywords: Continuous Auditing, Continuous Auditing Model

1. INTRODUCTION

The Kenya government financial system has undergone changes with the traditional paper-based manual systems being replaced with automated systems. The traditional source documents such as purchase orders, invoices, and cheques previously used for audit evidence are now in electronic form. The change in business process that removes the paper-based sources of information requires the creation of new audit procedures. In addition, business transactions have become complex and thus increased risk exposure such as possibility of fraud and misappropriation of funds. This calls for a more effective audit to mitigate these risks. Automation of the audit process would result in greater efficiency, timeliness, and high quality audits. The deployment of a continuous auditing system would be an effective audit method of modern business processes.

This research sought to explore the necessary requirements for implementation of continuous auditing by the Public Sector Audit Organization to perform audit work electronically with the aim of improving quality, reliability and efficiency of audit. The Public Sector Audit Organization, established by an Act of Parliament, is an independent office mandated to audit all Government Ministries, Local Authorities and State Corporations in Kenya. The objectives of the study included assessing the level of automation of the business systems used in processing transactions, investigating technologies, and automated audit tools for continuous auditing.

Several existing models of continuous auditing were studied. A step by step comparison of the selected models identified the key common elements covering technical, professional, and governance aspects of continuous auditing. These elements were hence proposed for adoption in continuous auditing by the Public Sector Audit Organization.

2. LITERATURE REVIEW

2.1 Continuous Auditing

According to Canadian Institute of Chartered Accountants and American Institute of Certified Public Accountants Research Report (CICA/AICPA, 1999), Continuous Auditing is “a methodology that enables independent auditors to provide written assurance on a subject matter using a series of auditors’ reports issued simultaneously with, or a short period of time after, the occurrence of events underlying the subject matter”. Developments of continuous auditing over the last 20 years include use of Audit Modules (AM) to capture and evaluate information when predetermined integrity constraints were breached (Groomer and Murthy, 1989), Continuous Process Auditing System (CPAS) to deal with the issues surrounding an increasingly paperless audit environment by continuously monitoring and auditing AT&T’s billing system (Vasarhelyi and Halper, 1991), and the joint report on continuous auditing sponsored by the Canadian Institute of Chartered Accountants and American Institute of Certified Public Accountants (CICA/AICPA, 1999).

Advancements in technologies have continued to improve Continuous Auditing. Auditors therefore need to have proficiency of the emerging technologies required for the automated systems. These technologies include Embedded Auditing Modules (EAM), Extensible Business Reporting Language (XBRL), Database Technology, Data Warehouse, and the Internet (Hanli et al., 2007). In addition, there are various tools and techniques which aid in analysis of transactions and internal controls. These tools can either be purchased software packages or auditor-designed modules. The tools are collectively referred to as Computer Aided Audit Tools and Techniques (Rezaee et al., 2002).

In today’s environment, organizations can produce standardized financial information on a real-time, online basis. Real time accounting needs real time auditing to provide continuous assurance about the quality of data. This calls for various technical conditions to be present. These includes reliable systems, highly automated continuous audit process and effective links between the audit’s firm system and the clients system to enable fast, accurate and secure communication of audit instructions and results (Shields, 1998).

2.2 Review of Continuous Auditing Models

Four models of continuous auditing were examined as described below:

2.2.1 Continuous Audit Approach (Rezaee et al)

This is a conceptual model which describes Continuous Auditing methodology. An optimal Continuous Auditing is one that uses client/server architecture and web-enabled data for delivery to audit work stations. The approaches for collection and storage of data include use of an audit data warehouse and audit data marts. In the former approach, a repository for storing transaction data produced by different business systems (data warehouse) is designed. This data warehouse should be scalable to allow for more data as audit continues. This approach is appropriate for dispersed systems with varied data formats. The other

79 approach is where audit data marts are used to automate the capture of relevant data, and
80 the auditing and reporting processes

81 **2.2.2 Model For Secure Continuous Auditing (Onions)**

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83 The model is concerned with three basic data examination areas. These are keystroke level,
84 transaction level, and transaction pattern level data. It suggests that in order to guarantee
85 the integrity of accounting information captured in ledgers, it is necessary to monitor all
86 keystrokes and transactions within the system, and then search for patterns in groups of
87 transactions. The keystroke level data examination, involves monitoring database utilities
88 and applications for commands which could cause fraud or error. These utilities give users
89 ability to modify and update a master file, bypassing the normal safeguards present in the
90 accounting system itself. Transaction level data examination involves auditing and reporting
91 on each transaction at the time of entry, each being treated as an isolated entity. This is
92 meant to ascertain whether each transaction meets the set business rules. Transaction
93 pattern level examination involves examining the effects of transactions, as a whole over a
94 longer time period. Expert systems trawl through stored transactions looking for patterns as
95 defined by business rules so as to identify transactions which could together result in fraud.

96 **2.2.3 Continuous Audit Model (Woodroof and Searcy)**

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98 The model was developed and implemented within a debt covenant compliance domain. It
99 therefore relates to a particular business domain and aims to create a working model of
100 Continuous Auditing. The definition of Continuous Auditing used in this model is, "an
101 assurance service, where the time between the occurrence of events underlying the
102 particular subject matter of a client, and the issuance of an auditor's opinion on the fairness
103 of the client's representation of the subject matter is eliminated.

104 **2.2.4 Integrated Continuous Auditing, Monitoring, and Assurance Conceptual Model** 105 **(Coderre)**

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107 Continuous auditing helps auditors to identify and assess risk, as well as establish intelligent
108 and dynamic thresholds that respond to changes in the organization. It also supports risk
109 identification and assessment for the entire audit universe, contributing to the development
110 of the annual audit plan, as well as the objectives of a specific audit. The focus of continuous
111 auditing ranges from controls-based to risk-based while the analysis techniques used in it
112 range from the real-time review of transactions to the analysis of trends over time.

113 **2.2.5 Comparison of the Four Models**

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115 We made a comparison of the elements among the models as shown in Table 1. The
116 comparison indicated that the Integrated Continuous Auditing, Monitoring and Assurance
117 Conceptual Model is more inclusive as it encompasses a wider scope of continuous auditing
118 which include technical, professional and governance aspects. Hence the model was
119 proposed for adaption by the Public Sector Audit Organization. The other models (Rezaee,
120 Onions, and Woodroof) are biased towards the technical architecture.

121 **Table 1: Comparison of four selected models**

Element	Continuous Audit Approach (Rezaee et al)	Model for Secure Continuous Auditing (Onions)	Continuous Audit Model (Woodroof and Searcy)	Integrated Continuous Auditing Conceptual Model (Coderre)
Accuracy (fraud and error) within transactions	Standardized audit tests are built into audit data marts. They run either continuously or at predetermined times. These gather evidence and then generate the relevant reports	Transactions are checked both at time of entry and later	Rule-based detection by digital agents	real-time review of transactions to the analysis of trends over time
Reliability of internal control system	CAATS are used	Parsing of keystrokes to detect database management utilities	Adapt and apply SYSTRUST principles	CAATS are used
Real-time	Real-time processing is the aim for this system	All proposed systems run in parallel with operational systems in real-time	Real-time reporting is one of the aims of this model. To this end, information must be collected and monitored in real-time	Frequency of analysis will depend on the level of risk and the degree to which management is monitoring the controls
Reporting method	Web-enabled data delivery of data to auditors' workstations, where reports can be generated (possibly by Generalized Audit Software).	Graded alerts sent through Virtual Private Networks (VPNs) to audit Department.	Three levels of reporting, alerts are sent to the audit or via email. Evergreen reports are produced on demand through a web interface – information pull approach	Prioritizes results and determines the frequency of the continuous auditing activities. Runs the tests on a regular, timely basis.

3. METHODOLOGY

Survey method using questionnaires was used to collect data from the target population of 400 auditors in the Public Sector Audit Organization who perform the financial audits of the Kenya's central government, local authorities and state corporations. This descriptive method enhanced a systematic description that was accurate, valid and reliable as possible regarding continuous auditing in the public sector. A total of 100 auditors participated and this sample fulfilled the requirements of efficiency, representativeness, reliability and flexibility.

133 The key questions posed to the respondents included: Extent to which business systems
134 and processes are automated; Amount of data in business systems that was in auditable
135 format; Extent of the availability of data extraction and analysis tools; Skills and knowledge
136 possessed by the auditors; Existence of adequate information technology infrastructure for
137 continuous auditing

138 Data collected was analyzed using SPSS and Excel. In addition the Audit Command
139 Language (ACL) software and a database system of a government ministry were used to
140 demonstrate how data can be obtained directly from a client system and audited shortly after
141 the transactions take place.

142 The research design logically linked the data that was collected and the conclusions drawn
143 and to the initial questions of a study so as to ensure coherence. The design was an action
144 plan for getting from the questions to conclusions. This ensured that the concept of
145 Continuous Auditing was made clear and provided a model of how it can be implemented in
146 the Public Sector Audit Organization.

147 4. RESULTS AND DISCUSSION

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149 The results are discussed in five categories: Business Systems and Processes; Auditable
150 Data Format; Data Extraction and Analysis Tools; Data Analysis Knowledge and Skills; and
151 Information Technology Infrastructure. Table 2 represents an aggregate of the categories.

152 **Table 2: Summary of Responses on Continuous Auditing**

To what extent do you agree with the following statements regarding continuous auditing in the organization	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Automation of Business Systems and Processes	2.6	39.5	18.4	32.9	6.6
Auditable Data Format	6.6	15.8	13.2	52.6	11.8
Availability of Data Extraction and Analysis Tools	21.1	31.6	14.5	26.3	6.6
Auditor Data Analysis Knowledge and Skills	11.8	25	28.9	30.3	3.9
IT Infrastructure for Continuous Auditing	11.8	46.1	18.4	23.7	0

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154 39.5% of the respondents agreed that business systems and processes were automated
155 while 42.1% disagreed. Business systems and processes automation is a key consideration
156 necessary for implementation of continuous auditing. When asked whether the data obtained
157 from these systems was in an auditable format, 64.4 % agreed. This suggests that auditors
158 would be able to perform audit procedures soon after obtaining the data without having to
159 perform data cleaning and conversion. Further, the respondents were asked the extent for
160 the availability of data extraction and analysis tools where 52.7% disagreed. This means
161 access to the tools was very low. This was followed by the question on whether the auditors
162 possessed skills and knowledge in use of these tools in which 36.8% disagreed. This
163 indicates that there is need for more training in use of Computer Aided Tools for the auditors.
164 Finally, 57.6% of the respondents disagreed on the existence of adequate Information
165 Technology infrastructure for continuous auditing suggesting the need for Public Sector
166 Audit Organization to invest in Information Technology resources in order to realize
167 continuous auditing.

The research sought to find the control measures and risk management models put in place by the management. This is an important condition for implementation of continuous auditing. Table 3 summarises three components: Adequate System Control Measures; Efficient Internal Controls and Processes; Risk Assessment Model.

Table 3: Summary of responses on continuous controls and risk assessment

To what extent do you agree on the existence of the following	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Adequate System Control Measures	1.3	11.8	36.8	46.1	3.9
Efficient Internal Controls and Processes	5.3	25	39.5	26.3	3.9
Risk Assessment Model	5.3	48.7	23.7	22.4	0

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The results indicate that 50% of the respondents indicated that there exist controls within the clients' systems. It further indicated 36.8% of responses were neutral about existence of controls. Those who did not agree on existence of the controls formed only 13.1%. There is therefore a strong indication that the systems in place have adequate controls. In regard to risk assessment, majority of the respondents (65%) indicated that there were no existing risk assessment models in the client's organization. This suggests that the role of identifying the risk areas within the organization has not been prioritized.

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5. CONCLUSION

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The study found out that time is ripe for continuous auditing to be implemented in the Public Sector Audit Organization in Kenya since most of the requirements for it are already in existence. With the advancement being made in technology and the changes in the Kenya government financial management system, the use of continuous auditing is an important paradigm shift which will enable the auditors to remain relevant and cope with these changes. With the increasing automation of business processes, the use of continuous auditing can increase efficiency in the Public Sector Audit Organization. There would be tangible benefits that would result in the use of continuous auditing and hence enable the office to carry on it mandate effectively and with ease.

The findings indicated that there was a low level of training in the skills necessary for continuous auditing among the respondents. It is therefore recommended that training needs in future should incorporate these skills and knowledge. In addition, the study revealed that there was no adequate investment in IT resources and infrastructure. It is therefore important to consider improvement in these resources in future in order to realize continuous auditing.

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Further research work needs to explore the use of intelligent agents in conducting audit. The use of these agents to detect unusual activities or unexplained activity patterns and alert the auditor would play a great role in changing the way audit is done. There is need for the development and implementation of tailor made continuous auditing software tools that would encompass all the required functions of continuous auditing.

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207 **COMPETING INTERESTS**

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209 The authors declare that no competing interests exist.

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