Proposal of Continuous Audit Model

Data Integration Framework

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***Abstract*—The approximation of business areas with the use of new technologies, real-time savings, transactions with several countries and on several continents with different law guarantees are necessary. These warranties can be acquired through Continuous Audit (CA). Some research contributions may be listed as: provide a standardization of data and nomenclatures for the data used by Continuous Audit procedures; re-use of previously developed detection and analysis algorithms; reduction of the development and implementation costs of the processes of continuous audit in organizations due to the standardization of data and the reutilization of algorithm; encouragement for the creation of a repository of public access algorithms. The paper also aims to contribute to the literature with the deepening of ways to access, structure and collect critical and / or necessary data for CA. With the deepening of Audit Data Standard and eXtensible Business Reporting Language (XBRL), as well as creating a basis for future research with the integration of extraction, analysis and exception detection algorithms that are used by CA.**

Keywords-Continuous Audit; XBRL; Audit; Audit Framework

I. INTRODUCTION

Real-time economics and globalization have caused an increase in the amount of data that is captured and stored. This change is also facilitated by lower costs of storage, e-commerce, and increased use of information technology in business, such as Enterprise Resource Planning (ERP) systems, which generate huge amounts of transactional data for users. Various business systems have been developed to support decision making, planning and control, as well as monitoring organizational performance [1][2]. However, this phenomenon of high data volume requires a different approach to audit.

After conducting a global fraud research, the Association of Certified Fraud Examiners found that fraud costs organizations 5% of their annual income. The average time to detect and report frauds was 18 months. Confidence has been in traditional external audits as the primary fraud detection technique, however, these have only accounted for 3% of frauds. On the other hand, the implementation of controls to detect frauds has been proven effectiveness in reducing costs and extent of fraud [3].

Companies are increasingly dependent on computerized systems, such as ERPs, to handle their business processes. This process of business computerization, coupled with real-time economics, encourages and requires companies to generate data in a timely manner. To extract useful information, and finally knowledge that can support decision making [4], it is essential to ensure the quality and reliability of this data [5].

Advances in technology enable real-time or near-real-time monitoring; however, audit services have evolved at a much slower pace. Most of these services are still performed manually, an approach that is time-consuming and costly [6]. This comes in contrast to the technology currently available, which can offer ongoing credibility support.

Various aspects of the audit need to be reviewed. While traditional audit takes a sample-based approach, mainly due to time constraints and budgets, continuous audit examines the entire population of record. Companies can benefit from the use of automation and technology to improve the efficiency and effectiveness of auditing through the implementation of continuous auditing systems. Companies can lower the cost of work associated with audits by taking advantage of computerized technology and systems. In addition, this can increase the efficiency of their production [7][8].

Continuous Audit is an audit process that produces audit results simultaneously or in a short time after a relevant event occurs [9]. The continuous auditing implementation is only feasible as a fully automated process and with immediate access to relevant events and their results. To meet these requirements, systems must be permanently connected, for both auditors and auditees.

Continuous auditing begins to gain more space as organizations gain more automation in their business processes and, therefore, the requirements for monitoring business risk [10]. However, the development of continuous

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auditing has enormous technological and organizational challenges. The wide variety of software used in companies makes it difficult for auditors to develop integrated auditing systems. Many pieces of such software were designed as stand-alone systems, with little or no network communication capability. However, the current stage of ERP development demonstrates a greater tendency for standardization and better integration with other subsystems [11].

Traditional audits and the use of small sampling techniques are progressively less effective when dealing with large volumes of data. Unlike traditional auditing, continuous auditing does not work with samples, it analyzes the entire transaction population, which allows the change from manual detection to the development of prevention capabilities [12]. O'Reilly [13] points out the benefits generated using CA methodologies:

- Make the audit process faster, cheaper, more efficient and more effective;
- Reduce the time needed for audit cycles, providing better response times for risk control and reliability of operations;
- Increase the coverage of audit work without increasing the amount of resources needed;
- Enable the conduction of audits daily, monthly or in the interval of time that is deemed appropriate;
- Automate periodic audit testing, improving audit execution time;
- Test 100% of the data population in the audit work and not just a sample;
- Improve the quality of the audit and its speed.

CA allows corrective action to be taken sooner than traditional approaches. The focus of the audit will shift from manual detection to technology-based prevention [14]. The CA allows the auditor to analyze the data more frequently by performing control and risk assessment in a real-time environment. It allows the opportunity to go beyond traditional auditing approaches, such as sampling and analyzing at a specific point in time, providing automatic and timely detection of failures in controls and exception situations, directing efforts to find the facts and remedies needed [12].

Real-time monitoring techniques can reduce errors and fraud, increase operational efficiency and profits [12]. Sarbanes & Oxley (SOX) defines rules and conditions for auditing and controlling operational risks, which has created complex demands for companies. The legal requirement of financial statements to be published in real time led to the need for transactions to also be audited in real time [14].

The required control for compliance with legislation has forced companies to look for ways to meet this requirement at acceptable costs. The CA has been gaining strength due to the possibility of automating risk control through the early perception of possible problems, by using internal control to act in a preventive and no longer detective way [12].

Continuous auditing and monitoring can improve the efficiency of auditing work through automation and adoption of an audit-by-exception approach. In this approach, the total population is analyzed and only exceptions are investigated. This is a type of audit that can be done more often, in which exceptions are identified, and alarms are sent to those responsible to correct these errors. If they fail to correct the errors in a timely manner, the internal audit department may be notified to act [15].

In the literature, there are numerous studies that use statistical tests and techniques to identify exceptions [16] [17]. The proposed methodologies are efficient in helping auditors to identify anomalies and exceptions [18] [19]. However, these studies do not integrate with each other, and do not address the issue of data availability and extraction ways.

Flowerday et al. [14] describe problems affecting continuous auditing solutions is the variety of data formats and records, including legacy systems that are crucial to creating continuous audit system. For this, it is necessary that there is an evaluation and standardization of this data so that there are no processing errors.

The standardization of data format is the most complex and challenging aspect for building CA capabilities, which may entail high costs and complexity due to the need to collect information from different systems [20].

In light of the exposed issues and the difficulties pointed out by previous studies, the following problem question arises: How to standardize the data of the various systems so that it is possible to implement continuous audit?

A. *Research Objetives*

The general objective of the paper is to propose the development of a framework for integration of different systems for continuous auditing.

B. *Specific Objetives*

- Identify the structure of XBRL and Audit Data Standard templates;
- Define methodology and definition of classes and attributes;
- Identify flowchart of processes and data;
- Test the model and framework

II. BACKGROUND

Continuous Audit studies present as difficulties the availability and high cost of data access for the implementation of monitoring routines. As a consequence, what is lacking in the academic and professional literature is a deeper analysis of how to collect, structure, and elaborate sampling of critical data for Audit analysis. This omission of methods and standards can undermine the work of the auditor by multiplying his sample bases beyond what is necessary, which will lead to auditing in a larger number of substantive tests as well as too many analytical procedures [21]. The ability to access and retrieve information from a variety of sources, including legacy systems, is a crucial point in creating a CA system. This makes it important to standardize data. However, this can be a complex and costly process [14].

The high investments required for CA implementation are pointed out in [14] as a difficulty to be overcome for

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adoption. Similarly, the financial scandals that occurred in large organizations over the last decade, due to the execution of internal frauds, have amplified the performance of the audit, which needs to carry out analyzes in an instantaneous way and in opportune moments. In addition, the rigidity of regulatory requirements, such as the Sarbanes & Oxley (SOX) Act and Corporate Governance principles that offer a high level of transparency and an organized and well-managed internal control environment, have increased the importance of Auditing, be it internal or external [21].

The need for instant and steady security about the efficiency of risk management and the internal control environment is critical. Organizations are exposed to significant errors, fraud and inefficiencies that can lead to financial losses and increased risk exposure [22].

A. Research Contributions

The paper aims to contribute empirically, with the development of a framework for the application of CA in organizations. This will help companies in their projects of Continuous Audit.

The approximation of the business areas with the use of new technologies, real-time savings, transactions with several countries and in several continents with different law guarantees. are necessary. These warranties can be acquired through AC. Some research contributions may be listed as:

- Provide a standardization of data and nomenclatures for the data used by Continuous Audit procedures;
- Re-use of previously developed detection and analysis algorithms;
- Reduction of the development and implementation costs of the processes of continuous audit in the organizations due to the standardization of data and the reutilization of algorithm;
- Encourage the creation of a repository of public access algorithms.

The paper also aims to contribute to the literature with the deepening of ways to access, structure and collect critical and / or necessary data for CA. With the deepening of Audit Data Standard and XBRL, as well as creating a basis for future research with the integration of extraction, analysis and exception detection algorithms that are used by CA.

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