Designing CA/CM to fit Not-for-Profit Organizations

Deniz Appelbaum (Rutgers, the State University of New Jersey) – denizappelbaum@gmail.com

Stephen Kozlowski (Rutgers, the State University of New Jersey) - spkozlow@aol.com

By Miklos Vasarhelyi (Rutgers, the State University of New Jersey) - miklosv@andromeda.rutgers.edu

Abstract

There has been much public attention recently regarding fraud and abuse in the not-for-profit (NFP) sector (Washington Post, 2013). The NFP sector has been subject to increasing pressure to conduct its internal audits in a more effective and efficient manner. In this setting, with the resources available to the Rutgers Accounting Research Center (RARC), a project evolved that is studying the demand for and application of Continuous Auditing/Continuous Monitoring (CA/CM) techniques by these NFPs. Although many large organizations have already implemented and incorporated these CA/CM tools into their internal and managerial activities to some degree (Alles et al, 2008), this occurrence has not been that prevalent in smaller organizations. Historically, small-to-medium sized (SME) organizations have not had an opportunity to participate in the benefits of CA/CM due to cost/benefit concerns, a general lack of product designed and priced for smaller organizations, and a lack of technical expertise in the organization. The purpose of this Rutgers Accounting Research Center (RARC) project is to undertake CA/CM implementations working with Small-to-Medium sized (SME) NFP organizations of varying sizes, business purposes, and levels of technical sophistication. The intent of this project is to demonstrate that existing CA/CM tools and techniques can be implemented and generate appropriate analyses in an SME NFP setting. This paper discusses in detailtwo completed case studies, one of which where the project team and SME NFP client successfully implemented CA/CM protocols in the payroll/HR process.

Keywords: Continuous Auditing tools, not-for-profit, Continuous Auditing, Continuous Monitoring

I. Introduction

There has been much public attention recently regarding fraud and abuse in the not-for-profit (NFP) sector (Washington Post, 2013). The NFP sector has been subject to increasing pressure to conduct internal audits in a more effective and efficient manner. Many large, and generally publicly-held organizations have implemented Continuous Auditing and Monitoring (CA/CM) tools into their internal and managerial activities to some degree (Alles et al, 2008), to support their internal audit function. Small-to-Medium sized (SME) organizations, and especially NFPs, have not had an opportunity to participate in the benefits of CA/CM technology due to cost/benefit concerns, a general lack of product designed and priced for smaller organizations, and a lack of technical expertise in the organization.

The overall purpose of this Rutgers Accounting Research Center (RARC) project is to undertake CA/CM implementations by working with Small-to-Medium sized (SME) NFP organizations of varying sizes, business purposes, and levels of technical sophistication. The intent of this project is to demonstrate that existing CA/CM tools and techniques can be implemented and generate appropriate analyses in an SME NFP setting. This paper discusses two pilot projects, the second in greater detail where the project team and SME NFP client successfully implemented CA/CM protocols in the payroll/HR process. The project team envisions this implementation will serve as a benchmark for CA/CM adoption.

This paper begins with this Introduction section, followed by the Literature Review section. The third section outlines the Motivation for the overall project, followed by a discussion of the Project Methodology. Section five recounts the Initial Pilot Projects, with the sixth section highlighting the Challenges of this endeavor. The final section concludes with general observations and suggestions for areas of future research.

II. Literature Review

Continuous Auditing and Monitoring (CA/CM) techniques were first described nearly twenty-five years ago (Groomer and Murthy, 1989; Vasarhelyi and Halper, 1991) and through use of computer-basedtechnology, applications have been developedthat can perform CA/CM analyses. Several research studies have described the benefits of continuous auditing (Vasarhelyi et al, 2004; Kuhn and Sutton, 2006), studied technical issues of CA/CM adoption (Kuhn and Sutton, 2006); discussed actual applications by businesses (Alles et al, 2004; Hermanson et al, 2006; Alles et al, 2008; Vasarhelyi et al, 2011), and explored the psychological issues regarding its adoption (Hunton et al, 2008, 2010; Gonzalez et al, 2012). Continuous Auditing (CA) may be defined as a methodology that enables independent auditors to provide written assurance on a subject matter using a series of auditor's reports issued simultaneously with, or a short period of time after, the occurrence of events underlying the subject matter (CICA/AICPA, 1999). Continuous controls monitoring (CM) provides a firm's management the ability to measure the effectiveness of the organization's internal controls (Vasarhelyi et al, 2012). Furthermore, the

adoption of CA/CM by organizations has been attributed with offering many improvements such as reduction of accounting errors, more real-time analysis and alerts of anomalies, and better audit efficiency and effectiveness (Vasarhelyi et al, 2004; Debreceny et al, 2005; Flowerday and von Solms, 2005; Kogan et al, 1999; Rezee et al, 2002; Vasarhelyi et al, 2002; Kuhn and Sutton, 2006). The differences between a traditional audit and a fully continuous audit that lead to the touted benefits are shown in Table 1 below (Vasarhelyi et al 2012):

Facets of Audit:	Traditional	Continuous
Audit Objectives	Assurance on the financial reports presented by management	-Improvements on data quality -Creation of critical meta-controls
Audit Approach	Traditional interim and year end audit	Audit by exception/monitor alerts
Data Access	-Case by case basis -Data captured during the audit process(batch, historical)	-Complete data access -Audit data warehouse, production, finance, benchmarking and error history
Audit Automation	Manual processes and separate IT audit	-Continuous monitoring and immediate response -Most of the audit is automated
Audit and management Overlap	Independent and Adversarial	Purposeful parallel systems and common infrastructures
Management of Audit Function	Financial organization supervises audit and matrix to BOD	-Centralized and integrated with risk management and compliance and SOX layered with external audit firm

Analytical Methods	Financial Ratios	-Corporate models of main sectors of the business -Early warning systems of outliers

Table 1: Characteristics of the Traditional and Fully Continuous Audit

Alles et al (2002) describe continuous auditing as the application of modern information technologies to standard audit products, whether the audit is internal/operational or external/financial. Originally, the ultimate goal of the CA process was to bring the external audit closer to the everyday internal processes of the client, and further away from the historical annual financial audit (Alles et al, 2008). Over time, however, CA/CM approaches have been mainly championed by internal auditors and less so by external auditors (Gonzalez et al, 2012; Alles et al, 2008). Every case study of CA/CM implementation in the academic literature has been limited to the internal audit function (Vasarhelyi et al, 2012; Gonzalez et al, 2012; Chan and Vasarhelyi, 2011).

Studies by accounting firms have not discussed their own use of continuous auditing techniques but about how CA/CM is being implemented (or not) by their clients (PwC 2006, 2007; KPMG, 2010; KPMG International, 2010; Grant Thornton, 2011). In these surveys, the firms discovered that about 7% - 13% of their clients had fully operational CA systems and/or tools in place and that another 13% to 37% had systems and/or tools available but were not deploying them (Gonzalez et al, 2012). Essentially, less than half of the surveyed firms had developed and/or deployed CA/CM systems and tools. As a continuation of these earlier non-academic surveys, Vasarhelyi et al (2012) conducted a field study on how awareness of CA translates into its adoption at some level by internal auditors. Internal auditors were interviewed and observed in great detail, and it was determined based on the authors' audit maturity model that all of the firms in their study were somewhere between traditional audit and emerging CA/CM – a huge difference from the reported survey results of between 7% – 13% full CA/CM system use. It could very well be that there existed confusion within the survey participants as to the difference between CA/CM system adoption and CA/CM tools adoption. Basically, an organization could be using an audit software such as ACL or IDEA, and incorrectly assume that their use of such a CA/CM tool constitutes a full CA/CM system.

Furthermore, according to Vasarhelyi et al (2004) in an earlier work, thisimplementation of CA/CM by internal auditors will begin with the automation of existing audit procedures before proceeding to any major alteration of the entire audit process. That is, manual tasks and components would be replacedby CA/CM techniques and/or tools on anindividual basis, in an

"infancy stage," until the feasibility and potentialvalue of this approach had been verified (Alles et al, 2008). Like any new technology, the biggest hurdle would be the transition from theory to practice (Alles et al, 2008).This path from the traditional audit to one of the fully mature CA/CM system was then explored in the field study by Vasarhelyi et al (2012) and its various stages were fleshed out in their Audit Maturity Model shown below:

Table 1
The audit maturity model.

	Stage 1	Stage 2	Stage 3	Stage 4
Audit maturity model stages	Traditional audit	Emerging CA audit	Maturing CA audit	Full continuous audit
Audit objectives	•Assurance on the financial reports presented by management	•Effective control monitoring	•Verification of the quality of controls and operational results	•Improvements in the quality of data •Creation of a critical meta-control structure
Audit approach	•Traditional interim and year-end audit	•Traditional plus some key monitoring processes	•Usage of alarms as evidence •Continuous control monitoring	•Audit by exception
Data access	•Case by case basis •Data is captured during the audit process	•Repeating key extractions on cycles	•Systematic monitoring of processes with data capture	•Complete data access •Audit data warehouse, production, finance, benchmarking and error history
Audit automation	•Manual processes & separate IT audit	•Audit management software •Work paper preparation software	•Automated monitoring module •Alarm and follow-up process	•Continuous monitoring and immediate response •Most of audit automated
Audit and management overlap	•Independent and Adversarial	•Independent with some core monitoring shared	•Shared systems and resources where natural process synergies allow	•Purposeful Parallel systems and common infrastructures
Management of audit function	•Financial organization supervises audit and matrix to Board of director	•Some degree of coordination between the areas of risk, auditing and compliance IT audit works independently	•IA and IT audit coordinate risk management and share automatic audit processes •Auditing links financial to operational processes	•Centralized and integrates with risk management, compliance and SOX/ layer with external audit.
Analytical methods	•Financial ratios	•Financial ratios at sector level/account level	•KPI level monitoring •Structural continuity equations •Monitoring at transaction level	•Corporate models of the main sectors of the business •Early warning system

M.A. Vasarhelyi et al. / International Journal of Accounting Information Systems 13 (2012) 267–281

Picture 1: Audit Maturity Model from Vasarhelyi et al, 2012

To summarize, in Vasarhelyi et al(2012) the firms and their internal auditors had progressed to Stage 2 of "Emerging CA audit" which entails: audit objectives of effective control monitoring, a traditional audit approach with some key monitoring processes, data extractions on cycles, audit management and work paper preparation software use, some integration of audit system core monitoring with management systems, some degree of integration between areas of risk, auditing and compliance with IT audit working independently, and analytical methods consisting of key financial ratios at sector and account levels. This is a far cry from the characteristics of the Full Continuous Audit which is an audit by exception of complete, real-time continuous data that is fully integrated with other organization systems and predictive in nature, as depicted in Stage 4 in Picture 1. As mentioned earlier, several papers investigate the level of current CA/CM technology adoption, where most organizations have adopted computer-based applications and tools but have not progressed further (Vasarhelyi et al, 2012; Gonzalez et al, 2012). In Vasarhelyi et al(2012), several issues were mentioned by internal auditors that impeded progress of CA/CM development: lack of or wavering support from management, limited access to data, limited permission to improve the audit-aid technology, and lack of technical proficiency and training of the staff. In these organizations, cost was not identified as a major barrier for the implementation of CA/CM. In Gonzalez et al (2012), the authors felt that the ease and clarity of

use, the support and encouragement of key organizational members, the annual sales volume versus the performance expectancy, and the strength of social influence and its effect on voluntariness of use were strong determinants of the degree of CA/CM adoption by firms. The prominent nature of the constructs of Social Influence and Voluntariness of Use implied that the slow adoption of CA/CM may be a result of the lack of socially conducive or coercive pressures by the audit industry. That is, the authors suggested that until CA/CM is championed by the auditing field as a whole, its use will generally lag.

However, to-datecomputer-based applications and tools have been effectivewhen applied to essentially continuous processing activities such as are found in the typical Enterprise Resource Planning (ERP) system (Alles et al, 2008, 2006).Most publicly traded firms have established ERP systems. Most firms operate on a real time basis as part of the real time economy (Economist, 2002). Businesses benefit from useful real-time information that is free from errors, omissions, and fraud (Chan and Vasarhelyi, 2011) – however, thesedata qualities cannot be assured unless the practice of traditional auditing keeps pace via CA/CM. It is very difficult to accurately and efficiently manually audit computerized systems and controls.

Not surprisingly,CA/CM approaches were successfully demonstrated in two pilot programs, one with a firm with highly automated business processes within a modern integrated ERP system, and the other with a firm with a fairly undeveloped level of automation and using mainly legacy relational systems (Alles et al, 2008). Both of these pilot studies were conducted with fairly large public multi-national firms subject to SEC regulations and reporting requirements. As such, these entities were subject to the demands of Sarbanes-Oxley (SOX), specifically Section 404, and were facing drastically increased workloads as well as higher standards for audit accuracy. Both issues were alleviated for these two firms when the manual audit process was replaced with automation (Alles et al, 2008). Both firms expressed a desire for audit automation due to the increased manual workloads from compliance with SOX (Alles et al, 2008).

However, according to Vasarhelyi et al (2012), there is no explicit relationship between CA/CM implementation and SOX compliance. The authors report that the technology of CA/CM can help fulfill SOX requirements, as described by their interviewees. CA/CM purportedly facilitates review activities and reduces the time required to meet SOX compliance. In one case, the auditors describe developing a monitoring tool that helped internal auditors work efficiently and effectively and that enabled comparison and benchmarking of internal controls. But, most firms in this field study had not implemented their own in-house version of control assessment, let alone off-the-shelf versions.

III. Motivation

Is a CA/CM implementation only possible or feasible for larger firms that have established ERP systems and are publicly regulated? All of the research to date would seem to imply that this is the case (Kuhn et al, 2010; Alles et al, 2008), as academic literature has been focused in this

direction. There has been zero academic literature to-date regarding the application of CA/CM in SMEs, public or private. What about entities who are not under the jurisdiction of the SEC? Alles et al (2008) propose that the demand for CA/CM did not really develop internally until the mandates of SOX began to be felt by public companies; it is not clear where CA/CM adoption would be today without that burden of regulatory compliance.What about smaller enterprises who do not utilize ERP systems? All of the studies have primarily addressed the technicalities of adding CA/CM modules to highly computerized firms (Gonzalez et al, 2012; Vasarhelyi et al, 2012; Chan et al, 2011; Hunton et al, 2008). Finally, what would be the challenges and potentialities of converting an internal manual audit procedure to one using CA/CM technology in a less technically developedSME?

Before addressing the challenges of transforming a manual audit procedure in a SME to a CA/CM-enabled audit, it is vital to consider if there could even be a demand for CA/CM in a small-to-medium enterprise. Some SMEs may have significantly fewer than 100 employees! Would this SME need CA/CM tools to audit its payroll? That is, what is the need to automate its manual audit process? After all, according to Alles et al (2002), the key driver for CA/CM is the demand for it. There is no guarantee that CA/CM procedures will prove to be cost effective or efficient, or that there would be a need for continuous processing (Alles et al, 2002).Furthermore, given Vasarhelyi et al (2004) earlier prediction that the transformation of the manual audit to a CA/CM process would start with a strategic implementation of specific, targeted tools to certain aspects of the audit, what sort of subsequent result would encourage a desire to develop CA/CM beyond this“infancy stage?” Basically, if the CA/CM transformation begins with applying Computer Assisted Audit Techniques and Tools (CAATTs) solutions to the existing audit procedures, why would the SME proceed to take the audit process beyond this level of integration? Interestingly enough, a recent study by Vasarhelyi et al(2012) confirmed this earlier prognosis with the observation that all of the firmsinterviewed were still at the “traditional auditstage” or “emerging stage,” despite having motivated internal auditors with access to CA/CM tools. Even the two successful pilot programs (Alles et al, 2008) tackled only one component of the audit procedures, and in that paperthe pilots were regarded as “emerging.”

Without the requirements of regulations and mandatory reporting that are faced by public entities, the possible motivation for anon-public SME to demand CA/CM applications is important to grasp. For some SMEs, this motivation may prove to be elusive due to cost/benefit concerns. Fortunately, one type of SME - non-for-profit (NFP) organizations –would seem to immediately possess sufficient incentive to undertake CA/CM approaches. Even though NFPs are not “public” companies, they are regarded in a similar fashion in that they rely on government grants, memberships and individual donations for their funding. Due to these sources of funding, NFPs are usually required to provide reports of additional auditor monitoring and internal controls (Johnson, 2005; Szymanski, 2003). Donors rely on robust monitoring because they personally do not reap a benefit from their contributions. Therefore, every NFP with more than $25,000 annual revenues must file a Form 990 with the IRS and make it available

to the public (IRC 6104(d)(1)(A)). Furthermore, any NFP entities who receive more than $750,000 in government grants or assistance are subject to a Single Audit (OMB A-133). The purpose of this Single Audit is to provide assurance to the granting agency that its funds were used appropriately by the NFP.

Furthermore, NFPsare uniquely susceptible to asset misappropriation due to a lack of direct ownership and lack of profit motive (Vanderwarren, 2001). In fact, this lack of defined ownership and profit motive creates both control and reporting issues for NFPs (Greenlee et al, 2007). NFPs primarily provide a service, and this service is measured by its effectiveness and efficiency (Gilkeson, 2006). NFPs feel significant pressure to avoid negative publicity and the reporting of even one incident of negligence and/or misappropriation of assets (Gilkeson, 2006) that might possibly be discovered. Such reports have historically led to huge drops in donation levels and fund raising efforts (Greenlee, 2000; Vanderwarren, 2001).

NFPs are also concerned with controlling operating costs since their revenues are not easily come by (Gilkeson, 2006). Furthermore, many NFPs are staffed very leanly, with employees undertaking multiple tasks (such as in purchasing) that would normally be segregated in larger firms (Greenlee et al, 2007). Also, they may be staffed with part time volunteers who are not able to closely monitor the financial transactions (Vanderwarren, 2001; Greenlee, 2000). In either situation, any improvement in the accuracy,cost, and efficiency of the external and/or internal audits should be welcomed by NFPs and help compensate for any internal control weaknesses (Vanderwarren, 2001). Additionally, there may be a general lack of technical expertise and a heavy reliance on manual processes and procedures in many NFPs.

This CA/CM implementation pilot project involves the developmentof fraud detection rules, scripts, and CA/CM routines based on input from the organization's management and staff. The subsequent execution of these routines, scripts, and ruleswill provide supportfor data analyses, including identification of exceptions, anomalies, trends, and areas of risk. The project also entails the development of presentation tools as requested by the client.To date, there have been two NFPs, both professional organizations, participating in the project.

IV. Project Methodology

A client profile was initially developed with which the team would assess potential clients for inclusion in the project. The criteria includes: Revenues and/or expenditures in excess of $15 million annually, headcount exceeding 65 employees, a mature accounting system in place, an engaged Audit Committee that supports the project, the use of generic, third-party accounting, payroll, membership, and fundraising software.

The project methodology includes both initiation and execution phases and proceeds as follows, once the client has agreed to participate: first, the project team gains an understanding of the client's processing scenario for the selected application area by means of interviews and

questionnaires; second, the team and client agree on appropriate data sources for the testing and the format in which the data will be presented to the team; third, the team presents typical testing scenarios and agrees with the client as to which scenarios to initially pursue; fourth, the team and client agree on appropriate analytics software to employ for the testing; fifth, the team implements the solution and generates appropriate tools to present the testing results.

One step in particular in the initiation phase that drives the execution phase involves the review with the client of questionnaires that the project team has prepared in advance. Questionnaires are used to efficiently and effectively gain an understanding of the client's specific operations and the data for which the CA/CM tools will be designed and deployed. The questionnaires originated from literature reviews and from those used by one of the team members when employed in a systems consulting role. The project team believes that the use of questionnaires is particularly applicable given the possible technical limitations of the target NFP client's staff, as the questionnaires will elicit responses that otherwise might be overlooked. Examples of questions posed to the client during the interview process are listed in Table 1:

Question	**Purpose**	**Typical response**
How many employees do you pay?	Indicative of volume of data and activity anticipated	Numeric
How many employees are salaried and how many are hourly?	Impacts testing routines that perform recalculations	Numeric
Who is your Payroll provider?	Identify major/minor provider and if the project team has worked with data from this provider before.	Provider name
Is Payroll interfaced with other systems?	Indicative of level of client automation and other databases that may be relevant for testing	Client narrative
How is Payroll information collected and entered (Master file, Timesheet, Other)?	Indicative of level of client automation and may indicate areas to target for testing	Client narrative
Which Payroll/HR files does the client have access to?	Indicative of ease of collecting data	Client Narrative

What tests are the clients currently running to test for duplicate transactions, etc.?	Indicative of testing to focus on with CA/CM tools	Client narrative

Table 1: Example questions for the client interview

Another important step in the initiation procedure is that of a review with the client of possible tests that can, with appropriate data as provided by the client, be undertaken. The initial list of potential tests is drawn from a review of tests as provided by several of the CA/CM application providers. This review of existing tests provides a foundation for the review and decision of which tests to undertake, as the client staff may have limited familiarity with the numerous CA/CM analytical techniques available to draw from. As each new client is interviewed and tests defined, the original list of tests is expanded so that a more robust listing has been provided for each subsequent client implementation. Examples of such tests are listed in Table 2:

Test	**Purpose**
Stratify payment amounts, hours worked, and check dates	Identify unusual trends and exceptions
Reconcile salaried employee pay from one period to the next	Identify unauthorized changes
List all employees working more than 40 hours a week	Identify possible fraudulent time reporting
Compare payroll files to HR files to match all deductions for insurance and 401k	Identify anomalies between databases
List possible duplicate payments based on the same day and same employee number	Identify duplicate payments
Review the sequence of check numbers for gaps	Identify possible fraudulent activities

Check for employees receiving paychecks after termination	Identify paychecks to terminated employees

Table 2: Example tests to undertake

The procedure for the execution phase is depicted in Diagram 1:

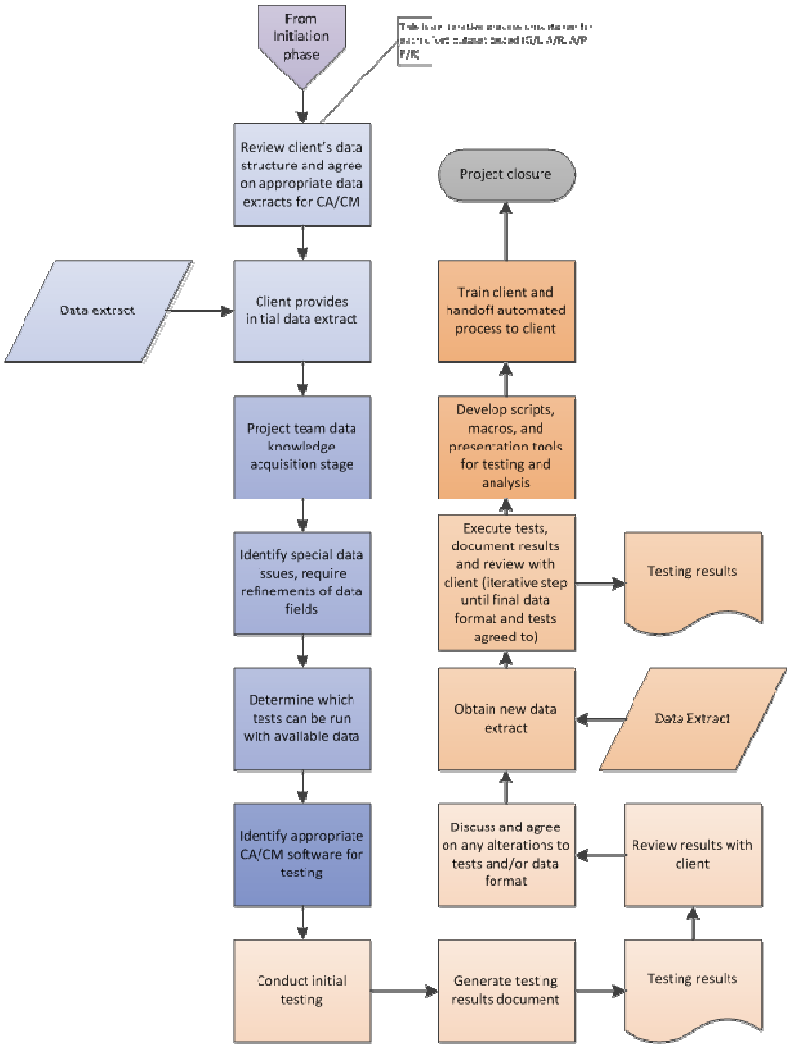

Diagram 1: Project Execution Steps

Subsequent to identifying the initial tests to be run, the client will review with the project team the data available on which the testing will be based. The specific data tables, attributes, and

their source will be identified. Sources typically include 3rd party applications, such as payroll providers, client systems, such as accounting packages[1], and other non-automated client sources, particularly manually prepared and maintained spreadsheets. The attributes of each data source are reviewed to identify those required to support the proposed CA/CM testing. The format of the source data is reviewed to determine if the proposed CA/CM tool can act on the data as-is or if the data needs to be reconfigured into a more suitable format. When identifying the various data sources used for CA/CM testing the project team also prefers to source or configure each table in a consistent format, such as MS Excel or CSV, to standardize the input into the CA/CM tool. The project team discusses data issues with the client in great detail to ensure client understanding of the data requirements, especially for those NFPs whose staff may not have an extensive background in databases and database design. When configuring data the project team requires the client remove or encrypt any sensitive attributes, such as employee personal details in Payroll/HR tables. Examples of typical data attributes, for payroll/HR testing, are listed in Table 3:

Attribute	**Purpose**
Employee ID	Test for duplicate payments
Hours (Regular, Overtime, Sick, Vacation)	Recalculation tests
Regular earnings (Salary, Hourly rate)	Recalculation tests
Dates (Check, Hire, Termination)	Test for pay before hire date, pay after termination date
Employee contribution percent (401K, FSA, Savings)	Recalculation tests
Employee contribution amount (401K, FSA, Savings)	Recalculation tests
Effective date of contribution change	Test for timely contribution changes taking effect

Table 3: Example data attributes for payroll/HR testing

[1] Due to the size of the pilot project clients the benefits provided by an ERP system could not offset the cost and support requirements involved and as such these clients had at most implemented packaged Accounting solutions.

The secondpilot project client has taken the initiative to merge several source data tables into a single ‘mega’ data extract, in MS Excel format, which includes only those attributes specifically required for testing.

Upon receiving the data extracts, the project team reviews the format of each attribute to ensure it coincides with that required by the CA/CM tool and reconfigures individual attributes as needed, for example, date format criteria.

After review and reconfiguration by the project team as required, the resultant data is loaded into the selected CA/CM tool. This step may include configuration of ‘projects’ in the CA/CM tool into which the data can be loaded, and thus translated by the CA/CM tool into a format suitable for testing purposes. Working within the CA/CM tool the project team next reviews existing routines as provided by the tool and selects and configures those as identified by the client, such as testing for duplicate records. The CA/CM tools generally provide pre-defined, standard routines such as tests for duplicates, missing records in a sequence, and others.

For specialized or highly sophisticated testing the project team utilizes the programming (macro) capabilities within the CA/CM tool and develops customized testing routines. The project team makes every effort to develop specialized routines using the capabilities provided within the CA/CM tool and if needed will reconfigure the client-provided data to fit the capabilities ofthe tool. The project team minimizes the amount of data reconfiguration needed as such an action would only increase the complexity in the resultant testing procedure and increase the level of client effort and sophistication required to provide data to the CA/CM tool. Custom routines or macros as developed in the CA/CM tool typically include tests for which data attributes from two or more sources will be compared for consistency. A typical example of such a test requires the comparison of the employee contribution percent for 401K (or other voluntary[2]) contributions. Examples of tests undertaken for the project are displayed in Table 4:

Test	**Purpose**	**Script**
Duplicates by Employee and Amount	Identify possible duplicate payments to employees in one pay cycle	Pre-defined duplicates test as configured in the CA/CM tool, based on employee ID (test 1) and check amount (test 2)
Check Date after Termination Date	Identify payments to terminated employees after	‘Check Date’ > ‘Termination Date’

[2] For voluntary deductions which the employee could change during the year, as some deductions were limited to an annual change or at a change-of-life event only.

	termination	
Overtime Pay at least ½ of salary amount	Identify possible overpayments to employees	'Overtime Amount' >= 'Regular Pay'/2
New hire pay before Hire Date	Identify payments prior to employment commencing	'Check Date' < 'Hire Date'
Payments without any benefits deductions	Verify that benefits deductions are being recorded properly	Search for payment/check where all 'Benefit Deduction' fields are -0-
Termination Date match	Verify the termination date coincides in both H/R and Payroll system databases	'H/R Termination Date' <> 'Payroll Termination Date'

Table 4: Example tests for payroll/HR

With data defined and provided, and tests identified and configured, the execution phase now becomes an iterative process where the project team launches the testing routines in the CA/CM tool, obtainsand analyzesresults, presents and discussesresults with the client, alters the testing routines and/or the data as required, and re-runs the analytics. During this iterative process the client will alter the data extracts to provide data more supportive of the current tests or newly defined tests, and the project team will alter the existing tests and/or configure new tests based on client requests. The project team allows for numerous iterations to ensure the client gains an understanding of the underlying procedures in order to provide a smooth hand-off at the conclusion of the project. To date the project team has found that this iterative process encompasses approximately a six-month period for Payroll/HR testing when working with one of the pilot project SME NFPs. The project team envisions that for applications with a somewhat less sensitive nature than Payroll/HR the iterative process can possibly be cut in half. As the project team gains familiarity with the overall process the timeframe should also decrease.

In addition to presenting the results based on the defined tests the project team also reviews the data for other anomalies or outliers. For example, for the second pilot project client the project team prepared an analysis of excessive overtime pay across several pay periods. The overtime pay test, as designed, analyzed excessive overtime pay within a payroll cycle only. By comparing overtime pay across several payroll cycles the project team identified a pattern of repetitive, excessive overtime pay charges for a particular employee. The client had not been aware of this situation before, found this analysis highly useful and followed-up on the situation.

After the individual tests and data structure is finalized with the client via iterative processing, the project team develops a script in the CA/CM tool that will launch the individual tests and output the analytics. The intent is to develop a script that allows the NFP to execute the tests and receive analytics in as efficient manner as possible.

The one area that the project team has encountered issues with, and has not been able to completely resolve at this point, is that consistency in the creation of the testing data by the client. The team has had to deal with varying data formatting and structure with the client-prepared data for the iterative testing.

At this point in the project the project team presents the results of the CA/CM testing and analytics in spreadsheet format (Excel) as discussions with the client focuson a review of specific transactions. The project team will refine the testing script as defined within the CA/CM tool in preparation for hand-off to the client.

V. Initial Pilot Projects

The First Pilot Project:

The first pilot project client was an industry trade association headquartered in the Washington DC area, with satellite locations in Mexico and China. This trade association has over 400 corporate members and a staff of 85. The primary source of revenue isgovernment grants and contracts, in addition to memberships and fees paid for educational/regulatory compliance services. This annual revenue has averaged about $28 million during the past ten years. The trade association acts, on behalf of its members, as an industry advisor for regulation, legislature, and business practices. This NFP prides itself on being at the forefront of modernizing business data processes, and desired to adopt CA/CM for its GL, AP, and AR ledgers initially, with Payroll/HR to follow. Although the NFP uses aMicrosoft Dynamics GP ERP system, the ledgers are manually audited by their internal auditorstaff in a batch process. External auditors perform the Circular A-133 Audits (single audits) and provide other advisory services. The NFP prides itself on being current in information systems, hence their interest in participating in this project. However, since there were tight internal controls in place, management expressed doubt that many new or material misstatements could beidentified.

The project commenced with the team researching in the literature and developing a questionnaire for each ledger. The second taskcomprised of extensive unstructured interviews with the client, where the team gained knowledge of the client's procedures, systems, and special concerns. Protocols were established for data access and encryption, as well as a project schedule that outlined expectations and timelines. Standards were established for the table and field name formatting. The client provided the following data tables for a specified time period: Vendor Master, Customer Master, G/L Chart of Accounts Master, G/L Transactions, A/R Invoice Detail, A/P Sub-ledger transactions, and A/R Sub-ledger transactions.The first data transfer of an entire

year of transactions was completed, after which the team embarked on the data knowledge acquisition stage and a further determination of which tests could be run, of any special data issues, and of any further refinement of data fields. At this stage, the audit automation software tools as developed by ACL were selected for use. This data knowledge acquisition phase was the longest of this particular pilot project study. The agreed upon tests were then run in a batch approach using the CA/CM tool. Scripts incorporating standard tests and entity-specific tests were generated. The tests that were undertaken, given the data provided included validating A/P Vendor information as listed in the A/P Sub-ledger transactions against the Vendor Master, and a similar validation between the A/R Sub-ledger transactions and the Customer Master. The G/L account as listed in the G/L transactions was validated against the G/L Account Master. A/R invoices were tied to related transactions in the A/R Sub-ledger transactions. In all cases no anomalies or errors were detected in the testing.

The results were then discussed with the client, and at which point they decided neither to continue with more data transfers nor to pursue incorporating any audit software into their ERP system. Since the tests had detected no anomalies in the data that would point to misstatement or misappropriation of funds, the client could not rationalize the cost/benefit to adopting a CA/CM tool into their processes. The NFP's own testing results mimicked those of the team, due to the extensive manual analytics that they conducted with their data and their rigid compliance to tight internal controls.

The Second Pilot Project:

The second pilot project client was a U.S.-based, national professional organization that requested that Rutgers develop a continuous auditing and monitoring prototype in the area of Payroll and Human Resource Benefits processing. Specifically, the team was asked to perform testing in the Payroll and HR areas as requested by the client and provide visualizations of the ensuing results. The project team is also developing predictive analytic routines with the support of this client.

This second non-for-profit project participant is considerably larger than the first, with offices in North Carolina, New Jersey, and New York. It has about 750 employees and 400,000 voting members whose dues contribute to about half of its revenues. In Fiscal 2013, it had annual operating revenue of about $225 million, with a positive cash flow of $6 million. Its revenue stems mainly from membership dues, conferences, publications, and other industry-related services. Although they were in the process of integrating their ledgers and audits within a newly upgraded cloud-based ERP system, they were dissatisfied with the Payroll/HR audit as this process was still quite manual and involved third party reporting.

The team met and worked primarily with internal audit staff for the duration of the project. The team met initially to present a list of Payroll/HR tests that had been previously developed. Review of this list elicited feedback from the client as to which tests applied to their situation

and which did not. The client provided information relevant to areas they wished to have investigated and the team developed tests to support the client's requests. This test development phase lasted for four months. As the client had licensed and was using ACLaudit software for several internal activities, the client and team agreed to configure the CA/CM tests using this product.

This project followed the same procedure as the previous study, with the exception that the project team was provided ten different reports bimonthlyfor the next four months that represented payroll, 401k, and benefits information from the client and its third party providers. These third party providers process payroll and benefits and administer the 401K plan. During the initial interviewing phase, ten tests were determined to be of interest to the client (Table 5). The team would then be able to develop customized scripts of the ten processes as requested by the client, and develop and refine these in an iterative fashion, as suggested in the software development industry (Larman, 2003; Boehm, 2000). Basically, scripts are being generated, tested, improved and refined based on the bimonthly tests and on the feedback regarding the results from internal audit management.

Additional managers from HR were brought in at a later phase, to validate the tests and to suggest refinements to the queries.

Test #	**Description**	**Summary**	**Risk**
1	Duplicates by Employee ID and Amount	Identify duplicate checks for an individual employee within a pay period by filtering on Employee ID and additionally another filter is then applied for duplicate amounts and <> 0	An employee is paid twice in the same period
2	Check Date after Termination Date	Identify payments with a termination date that is prior to the current pay period and an amount in the Other Pay field. Using the Gross Wages Table, a filter is applied testing whether check date precedes hire date fields	An employee continues to be paid after they no longer work at the NFP

3	Other Pay	Identify checks in the Gross Wages table that include an 'other pay' item, by pay period. This is determined by filtering for any amounts <> 0 in the 'other pay' field in the Paychex gross wages file, by pay period	An employee pay amounts is at a greater risk of being inaccurate given it has been manually changed
4	Overtime Pay	Identify checks paying for overtime that is at least ½ or more of salary amount	An employee is taking advantage of the overtime rules to generate additional income
5	Termination Date match	Compare separation date from Oracle to termination date as listed on the Paychex gross wages file by pay period and output Paychex records. Filter and reduce the term file first by dates	An employee continues to be paid after they no longer work at the AICPA or is paid the wrong amount on their last check
6	Hire Date test	Merge Hire Date (Current EE) information with Paychex Gross Pay data to determine if any payments were made to an employee before their hire date. Then check date < hire date	An employee first check is not accurate
7	Benefits Pay Hire Date	Benefits deductions should not occur until the 1st of the month following hire, unless the employee starts on the 1st of the month. This is filtered by first determining if the benefit start date is later than the hire date. Then a secondary filter is applied where the benefit start date is 1-30 days after the hire date	An employee's benefit selections are not reflected in their paycheck and thus they will not receive the benefit

8	Hourly wages for new hires	New hires starting after the first day of the pay period are paid by the day and those starting before the pay period are paid additional days	A new employee's pay is at a greater risk of being inaccurate given it is their first check and for a smaller period of time
9	HSA/FSA tests	New hires with HSA/FSA plans should not have these deductions occurring before the 1st of the following month. This test looks for any such deductions that may have occurred	An employee's benefit selections are not reflected in their paycheck and thus they will not receive the benefit
10	401K tests	The Oracle and Schwab files are merged and test to see if the percentage of contribution matches in Oracle and Schwab, particularly for contribution % changes. This test will determine which EE Contributions do not match the new percentage times the regular salary, other pay, overtime, and incentive	An employee's updated 401k and Roth 401K percentage is not reflected in their paycheck. Additionally, this could impact the NFP's employer match amount

Table 5: Initial client tests

Ultimately, scripts were developed for both the predictive (monitoring) phase and the detective (auditing) phase. For the monitoring phase, the team received the payroll report before it was provided to payroll processor, as well as the most current benefits and 401K reports. The tests were similar to the detective phase tests, except for the deletion of the Termination Date Match Test #5 and an addition of a test that matches the preprocess regular salary amount to the employee master file. This additional test is shown as a sample from the Payroll Preprocess script:

OPEN PayrollPreprocess_10152014

OPEN Pre_CurrentEE_10152014 SECONDARY

JOIN PKEY ID FIELDS EMP_ID NET_PAY SALARY_RATE Term_Date Rehire_Date Hire_Date E_1_REGULAR_HOURS E_1_REGULAR_AMOUNT SKEY ID WITH ID Annual_Salary Regular TO "Pre_CurrentEEProcessMerge_10152014" OPEN PRESORT SECSORT ISOLOCALE root

OPEN "Pre_CurrentEEProcessMerge_1015"

SET FILTER

DEFINE FIELD Pre_CalcSal COMPUTED (Annual_Salary / 24)

SET FILTER TO Pre_CalcSal <> SALARY_RATE

EXPORT FIELDS E_1_REGULAR_AMOUNT E_1_REGULAR_HOURS EMP_ID Hire_Date ID Term_Date Annual_Salary NET_PAY Regular Rehire_Date SALARY_RATE EXCEL TO "11_Pre_AnnualSalaryE1Reg_10152014"

CLOSE

It is expected that the predictive procedurewill identify most issues; however, best practices for CA/CM internal controls suggest that a detective procedure be included as well. There exists about a four day lag between the time that the predictive test layer is applied and the payroll is processed. It is quite possible that the data could be altered during this period, either intentionally or unintentionally. The detective layer is necessary as a further internal control.

The scripts were formulated to generate separate reports in Excel for each test type in the detective procedure. The project team was also tasked to automate the compilation of these test results into one tabulated file that would not only layer in the new test results progressively, but also generate graphs that illustrated trends in the data. This process was scripted as an Excel macro. Diagram 2 is an example of the graphs that were generated from the tabulated results:

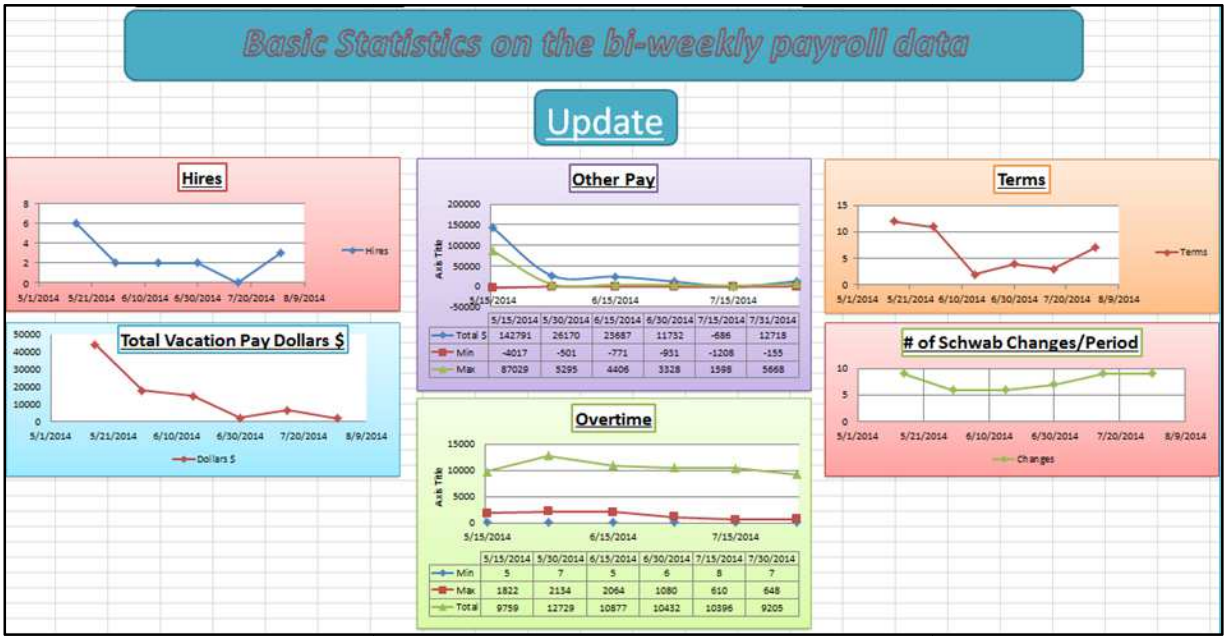

Diagram 2: Graphic presentation of the test results

The client is quite excited about implementing the payroll audit scripts into its procedures. A manual process that once required hours can now be run in only a few minutes! The results for management reporting, which the team also generated as a tabular file, will also be a product of scripting. The main challenge of scripting is the necessity of using a standard format for the tables and field names, as scripts are quite sensitive to any deviations.

Theinternal auditor staff at the client is highly motivated to integrate these automated Payroll/HR scripts within their ERP system, once employees are trained to use theaudit software. Although the client would like to capture as much information as possible in a real-time CA/CM environment, much of the payroll and its associated transactions and data cannot be real-time or continuous, but can only be batch-processed by definition. So although the scripts will be executed automatically, the process cannot be continuous. Despite this limitation, the potential within this client for transitioning to a completely automated CA/CM system with the other ledgers is huge.

Additionally, the internal auditorstaff is implementing these automated audit tools with the preliminary batch reports that are generated before the payroll is processed, as a predictive measure. So, in this case the CA/CM tools are being adopted in a predictive as well as in a detective manner, thus providing complete payroll risk assurance and monitoring in an automated fashion. It may very well be that this application of CA/CM tools is the best solution for the batch-oriented nature of this business process.

VI. Challenges

General Challenges of the Project:

Due largely to the nature of the target SME NFPs, there are several challenges that the team needs to assess in order to determine how final project negotiation and initial project development and implementation stages canoccur. It is anticipated that these following challenges may be typical for an advisor of many SME NFPs. The lack of technical expertise and funding available to support IT technology at many SME NFPs is reflected in the systems in place, especially outdated application software and/or database systems where there is little if any external or internal knowledge or support available.Understanding the design and function of little-known systems is a challenge to the project team, but has to be undertaken for a successful project.

Security over the data residing in these databases is likely to be inadequate, as well as the integrity of the data. Similarly, the mechanisms to provide for data security and confidentiality, if in place at all may be sub-standard.

The organizational procedures over not only the IT applications but business processes in general may also be outdated, poorly documented, and may not have evolved to identify contemporary fraud schemes. Outdated organizational processes may conceal fraudulent activities currently underway.

All of these situations entail an extended learning curve period for the team and possibly extend the project timeframe such that actual testing and analytical activities may be curtailed by a client weary of the time spent to-date on the project.

Although CA/CM software does not typically require the magnitude of investment required for an ERP system, the lack of proper funding for IT systems at the client may also impede the client's ability to acquire and implement such software.

A significant challenge during the development, implementation, and preliminary analysis of each project was the slightly changing configurations of the data extracted and provided to the team. For example, in the second NFP pilot project, the team received data for each payroll processing cycle (at the 15th and 31st of each month) over a period of several months. There would be slight variations in the position of the fields within the records, constant variations in the table and field names, with additional fields being included in the extracted records inconsistently. These issueswere eventually resolved, but they highlight the necessity for table and data formatting standards. In fact, the AICPA recently released (AICPA, 2013) their Audit Data Standards (ADSs) which suggest field names for both flat and XBRL formats; however, neither of the two major commercial audit software vendors has incorporated the ADSs in their products (CA/CM tools) as of the time of these two early pilot projects. Given that much time

and effort was expended by the NFP and the RARC team to standardize the data and tables for each bi-weekly data provision, the benefit of an industry wide adaption of these ADSs is apparent. Furthermore, if these ADSs could be implemented within many ERP systems, this general issue of data portability and formatting could be largely resolved.

Another challenge presented by the projects undertaken to-date is one of project development. Incremental development usually slices the project execution phase into sub-phases, where each sub-phase works on one aspect of the audit and/or script development. That is, there ideally is an initialization phase of knowledge acquisition followed by incremental phases of product redesign and refinement (Larman, 2003). Or, it could be thought of as the following phases: Planning, Collaboration (iterative), and Delivery. The first client project did not include an iterative Collaboration phase, where there would be incremental refinements to the scripts and tests, based on a regularly established schedule of data feeds to the team and of meetings with the NFP auditors. So far it would appear that the smaller NFPs may find it more difficult initiallyto accommodate CA/CM tools development, at least in this incremental fashion. However, the benefits derived from such tools might be more readily apparent for the smaller entities. The first and third NFPs are relatively small, and seem to be challenged by the initial data provision requirements and with the first clearly not seeing an obviouscost benefit of CA/CM tool adoption.

General Challenges of CA/CM adoption:

Both of the SME NFPs volunteered for this study, and expressed strong interest in automation of different aspects of their internal audits. What hindered their ability to adopt these tools previously was a lack of technical proficiency in the area of CA/CM adoption. Compounding this issue wasthe demand by regulatory agencies and donors for more accuracy and accountability in the financial reports and which compelled them to seek help in the adoption of some level of audit automation.

According to the AICPA (1999), CA/CM is a process that enables auditors to provide written assurances on any subject or data simultaneously to, or shortly after, its generation or after the occurrence of the underlying events (CICA/AICPA, 1999). Vasarhelyi et al (2010) state that “Continuous auditing is a progressive shift in audit practices towards the maximum possible degree of audit automation as a way of taking advantage of the technological basis of the modern firm in order to reduce audit costs and increase audit automation.” They then proceed to discuss how the development of CA/CM requires a basic reform in all aspects of the audit, from the kind of tests conducted, how alarms or alerts are handled, and how reports are generated, how often, and to whom – to name just a few of the changes. In order to become continuous and more real time, full CA/CM techniques rely heavily on fully developed ERP systems and business intelligence platforms - many which may be quite simplistic or patch-work in a SME NFP. One

of the primary challenges of this study is the visualization or mapping of thetransformation of a manual auditprocedure that predominates in manySME NFPs to that of a fully functional CA/CM process.

Traditionally, in most of the literature CA/CM has been treated as a concept rather than a tool or practice (Vasarhelyi et al, 2012). So if a firm declares that it has a CA/CM system in place, it has not been clear to what degree or what processes are automated. The first effort to measure this process was detailed by Vasarhelyi et al (2012), where the authors customized the Technology Adoption Lifecycle Model of Bohlen and Beal (1957) and Rogers (1962)for the audit. The Roger's formula of first"R&D", second "introduction",third "growth", and finally "maturity" was extended as follows to describe the following stages: 1) the traditional audit; 2) the emerging CA audit; 3) the maturing CA audit; and 4) the full continuous audit. In their study, even among highly motivated firms with advanced ERP systems and business intelligence capacities, CA had not evolved beyond the second stage. That is, even large firms had not budged past the steps of simply automating existing audit practices and the low hanging fruit (Alles et al, 2006). So the question begs, will any of these SME NFPs adopt CA/CM beyond the second stageof the emerging CA audit?

Furthermore, according to Vasarhelyi et al (2012), these four stages can be further classified according toseven criteria:

Criteria	**Definition**
Audit Objective	The scope of the audit task that is converted to CA/CM
Audit Approach	The extent to which the audit tasks become continuous
Data Access	Level of access to the data by the NFP's internal auditors
Audit Automation	The degree to which the audit processes are automated
Audit and Management Overlap	The extent that internal auditors rely on management's information systems
Management of Audit Function	Relationships between the internal audit, the financial audit, and other compliance departments
Analytical Methods	Degree of technical complexity of analytical processes performed by the internal auditors

Table 6: CA/CM Implementation Criteria

For this case study, the project team assessed the client with each of these seven criteria for the payroll application, ranked according to its progression with the CA/CM Adoption Model as proposed by Vasarhelyi et al (2012) and discussed earlier. For example, the first criteria Audit Objective was scored as being traditional, emerging, maturing, or full continuous. Of course, the ideal situation would be the fourth stage of the full continuous audit in all seven criteria of the payroll audit.

The results are shown below in Table 7 for the second pilot project client. This project to-date has been focused on Payroll/HR reporting, which by design is not continuous but batch-oriented. Because of the limitations imposed by the payroll function, the highest CA stage that the Payroll/HR audit can receive for any of the seven measurement criteria is a stage three, the maturing CA audit. The level of Audit Automation will be upgraded to 3 once the predictive and detective scripts are incorporated into the new HRM cloud-based system. Management of Audit Function, which describes the relationship between the different reporting parties, can be upgraded in the future as third party provider data files will be instantly available in the new system for the scripted tests, on a real-time basis.

Criteria	**Level of conversion to CA/CM**
Audit Objective	3 – the maturing CA Audit
Audit Approach	3 – the maturing CA Audit
Data Access	3 – the maturing CA Audit
Audit Automation	2 - the emerging CA Audit
Audit and Management Overlap	3 – the maturing CA Audit
Management of Audit Function	3 – the maturing CA Audit
Analytical Methods	3 – the maturing CA Audit

Table 7: Criteria Evaluation of CA/CM adoption

VII. Conclusion

This paper discusses a current project of the Rutgers Accounting Research Center (RARC)that is focused on the application of CA/CM approaches in the SME NFP environment, in an effort to understand the degree in which adoption of CA/CM may or may not feasibly support the NFPs with their reporting requirements. Furthermore, this study hopes to provide a greater

understanding of the circumstances and impetus that would lead to a demand for CA/CM in SME NFPs beyond that of simply CA/CM tools adoption that typifies the emerging stage, to that of a full continuous audit. Although the project is not complete, the potential impact and implications of this study are noteworthy and contribute to the wealth of CA/CM literature, even at this early phase in the project. The process of defining a Full Continuous Audit for these smaller enterprises, the process of outlining the implementation and evolution from a manual audit to one of CA/CM in the SME NFP environment, and the process and observation of CA/CM tool development in each NFP has been a demanding and robust endeavor and worthy of discussion. The questions raised about CA/CM as this projecthas evolved have been provocative as well. For example, an overwhelming curiosity exists in the team as to how and or when an SME NFP would adapt CA/CM approaches beyond the emerging stage. Basically, would the NFP sector perform any differently than the large public firms who, despite great motivation and interest in CA/CM, are not beyond this second stage? What sort of environment or impetus would need to exist for an NFP to progress to the third stage, that of Audit maturity? Would such a progression occur with more ease in a less technically evolved and less complex environment, more typical of a smaller business or NFP firm and not of a large firm?In addition to the initial two pilot project clients there are more NFPs in the project pipeline, several of which are charities. These charities will be segregated from the foundations, as the sources of funding differ. This paper will be followedby additional studies and discussions of the results from more case studies and hopefully, a better ability to answer the major question of this study: can modern technology find a home in more traditional organizations? And at what stage would this adoption occur?

The goal is to attain enough case studies that represent varying types of SME NFPs – foundations, hospitals, schools, houses of worship, and charities. Secondly, the team needs to conduct follow up interviews with all of the case studies, to track their CA/CM to usage and adoption over time. After all, just because a firm didn't initially evolve past stage two does not mean that this expansion cannot occur in the future! Hence, the measurement of time to develop CA/CM tools or adoption is also critical information for this study. Periodic interviews and updates from each NFP will also be conducted by the team.

The actual NFP case studies and the analysis of their CA/CM tools and systems adoption have just begun. However, the development of this project scope and framework approach, as well as many of the challenges associated with it, can contribute to the literature on CA/CM. Issues such as the tepid demand in organizations for CA/CM beyond the emerging stage (Vasarhelyi et al, 2012), the slow adoption by the industry of the AICPA's ADSs, and the need for CA/CM adoption standards and models are all areas for additional research beyond this immediate study.

References:

AICPA Assurance Services Executive Committee, Emerging Assurance Technologies Task Force. (2013) “Audit Data Standards, Base Standard”. AICPA, August 2013.

Alles, M., Brennan, G., Kogan, A., and Vasarhelyi, M.A. (2006)."Continuous monitoring of business process controls: A pilot implementation of a continuous auditing system at Siemens." *International Journal of Accounting Information Systems* 7, no. 2: 137-161.

Alles, M. G., KoganA., and Vasarhelyi, M.A. (2008)"Putting continuous auditing theory into practice: Lessons from two pilot implementations." *Journal of Information Systems* 22, no. 2: 195-214.

Alles, M. G., Kogan, A., and Vasarhelyi, M. A. (2002). “Feasibility and economics of continuous assurance.” *Auditing: A Journal of Practice & Theory, 21*(1), 125-138;

Boehm, B. (2000). “Spiral Development: Experience, Principles, and Refinements.” *Special Report* CMU/SEI-2000-SR-008, July 2000

Bohlen, J.M., Beal, M.G. (1957). “The Diffusion Process, Special Report No. 18” *Agriculture Extension Service, Iowa State College,* 1: 1957, pp. 56-77.

Chan, D. and Vasarhelyi, M. (2011): “Innovation and practice of continuous auditing”, *International Journal of Accounting Information Systems 12 (2011) 152-160*

Davis, F. D. (1989)."Perceived usefulness, perceived ease of use, and user acceptance of information technology." *MIS quarterly*: 319-340.

Debreceny, R. S., Gray, G. L., Ng, J. J. J., Lee, K. S. P., & Yau, W. F. (2005). Embedded audit modules in enterprise resource planning systems: implementation and functionality. *Journal of Information Systems*, *19*(2), 7-27.

Economist. (2002). “The Real Time Economy”. January 31, 2002.

Flowerday, S., & von Solms, R. (2005). Continuous auditing: verifying information integrity and providing assurances for financial reports. *Computer Fraud & Security*, *2005*(7), 12-16.

Gilkeson, N. (2006): “For-Profit Scandal in the Nonprofit World: Should States Force Sarbanes-Oxley Provisions onto Nonprofit Corporations?” *95 Geo. L.J.* 831 2006-2007. Downloaded from http://heinonline.org on Jan 5, 2014.

Gonzalez, G. C., Sharma, P. N., and Galletta, D. F. (2012). "The antecedents of the use of continuous auditing in the internal auditing context." *International Journal of Accounting Information Systems* 13, no. 3: 248-262.

Grant Thornton. (2011). "Looking to the future: perspectives and trends from internal audit leaders." Grant Thornton LLP.

Greenlee, J. (2000): "Accountability in the Information Age." *New Directions for Philanthropic Fundraising*, 27, 33-50.

Greenlee, J., Fischer, M., Gordan, T., and Keating, E. (2007): "An Investigation of Fraud in Nonprofit Organizations: Occurrences and Deterrents." *Nonprofit and Voluntary Sector Quarterly 2007 36:676,* September 2007

Groomer, S. M., & Murthy, U. S. (1989). Continuous auditing of database applications: An embedded audit module approach. *Journal of Information Systems*, *3*(2), 53-69.

Hermanson, D. R., Moran, B., Rossie, C., & Wolfe, D. (2006). Continuous monitoring of transactions to reduce fraud, misuse, and errors. *Journal of Forensic Accounting*, *7*(2006), 17-30.

Hunton, J. E., Mauldin, E. G., & Wheeler, P. R. (2008). Potential functional and dysfunctional effects of continuous monitoring. *The Accounting Review*, *83*(6), 1551-1569.

Hunton, J. E., Libby, D., Libby, J., Mauldin, E., & Wheeler, P. (2010). Continuous monitoring and the status quo effect. *International Journal of Accounting Information Systems*, *11*(3), 239-252.

Internal Revenue Code 6104(d)(1)(A)

Kogan, A., Sudit, E. F., & Vasarhelyi, M. A. (1999). Continuous online auditing: A program of research. *Journal of Information Systems*, *13*(2), 87-103.

KPMG. "Continuous auditing and monitoring: are promised benefits now being realized?" KPMG LLP; 2010.

KPMG International. "What is driving continuous auditing & continuous monitoring today?" KPMG International Cooperative; 2010.

Kuhn, J. R. and Sutton, S. G. (2010). "Continuous auditing in ERP system environments: The current state and future directions." *Journal of Information Systems* 24, no. 1: 91-112.

Kuhn, J. R., & Sutton, S. G. (2006). Learning from WorldCom: Implications for fraud detection through continuous assurance. *Journal of Emerging Technologies in Accounting*, *3*(1), 61-80.

Larman, C. (2003). "Iterative and Incremental Development: A Brief History" *Computer* 36 (6): 47-56.

PwC. (2006). "State of the internal audit profession study: continuous auditing gains momentum."

PwC. (2007) "State of the internal audit profession study: pressures build for continual focus on risk."

Rezaee, Z., Sharbatoghlie, A., Elam, R., & McMickle, P. L. (2002). Continuous auditing: Building automated auditing capability. *Auditing: A Journal of Practice & Theory*, *21*(1), 147-163.

Rogers, EM. (1962). "Diffusion of Innovations." New York: Free Press.

Stephens, J. and Flaherty, M. P. (2013). "Millions lost by nonprofits, with little explanation." *Washington Post,* Oct. 27, 2013.

Vanderwarren, K. (2001-2002): "Financial Accountability in Charitable Organizations: Mandating an Audit Committee Function" 77 Chi.-Kent L. Rev. 963 2001-2002. Downloaded from http://heinonline.org on Jan 5, 2014.

Vasarhelyi, M. A., & Halper, F. B. (1991). The continuous audit of online systems. *AUDITING-A JOURNAL OF PRACTICE & THEORY*, *10*(1), 110-125.

Vasarhelyi, M. A., Alles, M., Kuenkaikaew, S., and Littley, J. (2012). "The acceptance and adoption of continuous auditing by internal auditors: A micro analysis." *International journal of accounting information systems* 13, no. 3: 267-281.

Vasarhelyi, M. A., Warren Jr, J. D., Teeter, R., and Titera, B. (2011): "Embracing the Automated Audit." Working paper, Rutgers Business School.

Vasarhelyi, M.A., Alles, M.G., and Williams, K.T. "Continuous Assurance for the Now Economy." *A Thought Leadership Paper for the Institute of Chartered Accountants in Australia;* 2010.

Vasarhelyi, M. A., Alles, M. G., & Kogan, A. (2004). Principles of analytic monitoring for continuous assurance. *Journal of emerging technologies in accounting*, *1*(1), 1-21.

Zapotsky, M. (2013). Washington Post: “National Science Foundation IT Worker pleads guilty to stealing more than $94,000.” *Washington Post*, Dec 5, 2013.