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## Adopting Continuous Auditing/Continuous Monitoring in Internal Audit

Continuous auditing/continuous monitoring (CA/CM) has long been studied in academia and is widely discussed in practice.<sup>1</sup> CA can be defined as the assurance that independent auditors provide simultaneously with, or shortly after, the occurrence of events underlying the subject matter.<sup>2</sup> CM is a process implemented by management to ensure that business is operating effectively.<sup>3</sup> The Institute of Internal Auditors (IIA) clarifies the differences between the concepts: "Continuous monitoring is management driven and continuous audit is audit driven. CM is a process used as part of the control structure part of the COSO monitoring role. CA is part of the assurance process an aspect of audit."<sup>4</sup>

This article examines how internal audit has progressed with the implementation of CA/CM. How expectations regarding the adoption of CA/CM highlighted in a chief audit executives (CAEs) survey conducted by PricewaterhouseCoopers (PwC) in 2007<sup>5</sup> were realized is discussed using the results of a study conducted by CARLAB.<sup>6</sup> The CARLAB study includes the results of in-depth interviews conducted with nine companies that have implemented some form of CA/CM. The analysis of the results of both studies provides evidence on the stage of CA/CM adoption by internal audit organizations.

### THE DEVELOPMENT OF CA/CM

Reports on implementation of CA/CM systems are found as early as 1991, with a system implemented at AT&T to monitor billing data in real time.<sup>7</sup> The key characteristic of these data was their completely electronic nature, allowing AT&T to use data captured automatically by telephone switches. The system identified failures and data errors through analytic tools by comparing input data with benchmarks, notifying the auditor of deviations. The resulting low-latency error detection provided higher audit quality. It also allowed the audit to be conducted more efficiently and effectively since the auditor had

greater flexibility in the search for evidence.

In 1999, the Canadian Institute of Chartered Accountants (CICA) and the American Institute of Certified Public Accountants (AICPA) published a joint report on CA.<sup>8</sup> At the same time, systems with different levels of CM were starting to be developed in the industry (e.g., ACL, IDEA CaseWare) for continuous control monitoring.

Academic and professional interest in CA/CM is evidenced by the large number of articles published.<sup>9, 10</sup> Demand factors for CA/CM adoption include increasing data complexity and volume, prevalence of electronic transactions, web-based reporting, and user demand for more frequent information. The US Sarbanes-Oxley Act of 2002 (section 404) also includes provisions regarding management's assessment of internal control and reduced disclosure time, requiring effective rapid error detection.

### EXPECTATIONS REGARDING THE FUTURE OF CA/CM DURING 2007–2012

PwC conducted a survey<sup>11</sup> in 2007 among CAEs of Fortune 250 companies and thought leaders within the auditing community. The purpose was to determine both the factors that would reshape internal auditing in the future and how CAEs envisioned audit in 2012. The results show the following main factors:

- Fortune 250 CAEs found it important to consider the importance of the increase in risk produced by globalization.
- Fortune 250 CAEs pointed out the need to determine whether audit should be centralized or conducted from satellite locations close to operation centers. On this subject, Fortune 250 CAEs preferred US-centered auditing, with some controls implemented in locations at an international level. The need to find leaders in international centers was highlighted, as was the need to train personnel in areas such as control, risk management and IT audit.

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- Respondents envisioned internal audit providing risk and controls assurance, with technology having the greatest impact.
- Interviewees predicted the development of CA and/or CM, with different degrees of automation.
- Respondents suggested auditing the enterprise risk management (ERM) process, with additional duties attributable to auditing offshore operations, and fraud detection and investigation expected to generate greater responsibilities for internal audit groups as well.
- Other factors included auditing IT, auditing executive compensation, complying with regulations, and training and education of management and staff.

Internal audit was expected to go beyond a static and cyclical approach, to a state of continuously optimizing the use of technology on an as-needed basis. The report also explained that, at that time, CA/CM was rarely continuous or in real time, and that it mainly encompassed manual operations done more frequently than traditional audits. According to respondents, internal auditors would be able to integrate technology in the future to assist with data extraction and analysis. They also expected auditors to be better able to react to warnings and conduct more targeted audits.

The survey found that the main challenge was the lack of staff capabilities because traditional accounting and auditing skills were not sufficient to perform a quality audit within CA. Auditors must be able to conduct data analysis and assess complex IT environments, given that auditor demand was and is increasing in the areas of technology and regulation. Among the important skill sets needed for auditors, data mining and analysis, risk assessment, and information technology were highlighted by the respondents.

### CA/CM ADOPTION ACCORDING TO A CARLAB STUDY

The CARLAB study reports the results of interviews with auditors in large companies in different industries. The team visited nine leading internal audit organizations to conduct face-to-face interviews with 22 internal audit managers and 16 internal audit staff members. The team chose semistructured interviews, rather than a structured survey, to capture the participants' perceptions of CA/CM adoption. The results of this study indicated that:

- The adoption of CA/CM was still in its initial stages

- Internal auditors were interested in the adoption of CA/CM as well as adoption of more automated audit tools and electronic working papers
- Access to data was still limited
- Most audit tasks were performed periodically
- IT audit resources and capability were inadequate for CA/CM
- The emergence of many audit-like organizations was confusing assurance ability

### CA/CM ACCEPTANCE AND ADOPTION

The CARLAB study found four key factors affecting adoption. Each affects the perceived usefulness and ease of use of the technology:

1. **Management support:** CA/CM is perceived initially as an expensive and risky endeavor. It requires a considerable investment and access to data that must be supported by senior management. CA/CM requires a large degree of data analytics, as auditors are now able to audit the whole population instead of a sample of the transactions. Data analysis could generate in-depth audit results, and is the main advantage of CA.<sup>12</sup> However, access to data is usually limited because data extraction requires management approval and is performed by external parties, and data acquisition takes time. One of the interviewees reported: *"We had some challenges [with the IT organization to get data] but generally not. The biggest challenge really is the time it takes to get it."*

Few companies with high levels of CA/CM adoption have automated and secured systems for data extraction that auditors can access. Managers must also coordinate and supervise the friction and timing differences that are generated by audit via exception reports. One of the companies analyzed in the study has implemented system-

monitoring tools. Audit management mentioned: *“What we need to do is work with them to get them where they are continuously monitoring. Then, our audit can focus on how we are going to deal with the exceptions.”*

The involvement of managers in the adoption of CA/CM is fundamental. If managers do not perceive CA/CM as useful, they will not be willing to risk investing in it. Data access remains a key challenge.

2. **Employee competence:** CA/CM necessitates a higher competency threshold (skills and technological knowledge). Because internal auditors and managers are responsible for monitoring internal controls, they must access databases and systems, which vary across companies and even across divisions within the same company. It is possible to achieve this goal by hiring experienced auditors, a tactic cited by interviewees as the preferable approach. In addition, it is necessary to provide adequate training to audit staff.

There are substantive differences in the level of training at the companies interviewed. Some provide one or two training courses, while others tailor training according to the auditor's needs. Several of the interviewed firms have rotational programs that roll nonauditors through an audit function for 18 months in order to enable them to acquire a wider scope of business experience. These rotational programs contrast with the need for CA/CM auditors with a more specific and deeper process and system understanding. One of the interviewed companies suggested an approach to leverage IT knowledge within the audit department: creating a domain expert in each area and implementing an IT rotation program within the internal audit department. It was thought that this program could reduce the need for outsourcing and increase the level of knowledge transfer.

The full adoption of CA/CM does not seem to be possible without knowledgeable personnel who are competent with technological tools.

3. **Costs:** Managers perceive high set-up and implementation costs, although the interviewees do not identify cost as a barrier for the adoption of technology. The internal audit departments try to automate test tasks, especially repetitive and high-volume tasks, to increase auditor satisfaction and reduce latency. One of the internal audit managers stated that he considered the implementation of the technology-

aided audit as a win-win solution for both the organization and auditors: *“... We want to use the computer more to audit than before... Clearly if you can get both, it is a win-win. Ultimately, the business auditors should be happier. Nobody likes to test 50 things over and over again.”* However, task automation may be hindered by the existence of legacy systems.

Although it was not mentioned as an impediment, CA/CM requires high levels of investment in technology and training, which hinders some companies' adoption of CA/CM.

4. **Regulatory compliance/audit-like organizations:** The US Sarbanes-Oxley Act of 2002 (section 404) includes provisions regarding management's assessment of internal control and reduced disclosure time. It requires all public companies operating in the US to comply with this act. Its adoption has substantially affected internal audit departments of the respondent firms. Each company interviewed has a specific division to monitor and ensure compliance. Although there is no explicit relationship between the internal audit and compliance functions, CA/CM facilitates Sarbanes-Oxley compliance by enabling review and reducing time needed for performance. The internal audit department of one company that developed automated tools to aid internal audit work, including Sarbanes-Oxley compliance tasks, indicated that *“... To the extent of last year, 100 percent of all the testing that [the external auditor] would have performed for [Sarbanes-Oxley] is performed by the company.”* Auditors could monitor controls continuously and receive benchmark reports.

The study found that many audit-like functions, which most often had heterogeneous tooling, actually lacked coordination, information-sharing and repeated procedures. These functions had titles such as internal controls, compliance, fraud, internal audit, Basel III and Sarbanes-Oxley. The Sarbanes-Oxley compliance benefits realized by CA/CM encourage its adoption by regulated firms.

#### LEVELS OF ADOPTION OF CA/CM

To evaluate levels of CA/CM adoption, the CARLAB study classifies the interviewed companies into four categories based on adoption maturity. The first stage corresponds to traditional auditing with periodic reviews. The second stage (emerging) includes early adopters who automate existing audit practices that are easily and simply automatable. Once users appreciate



the benefits of those processes, CA is extended to other areas of the audit, characterizing the third stage (maturing). This extension is more time- and resource-intensive because it may require some process reengineering. In the final stage, all audit processes are automated (CA), with auditors engaged in analyzing results and exceptions.<sup>13, 14</sup>

Companies' adoption levels are measured along the following seven dimensions:

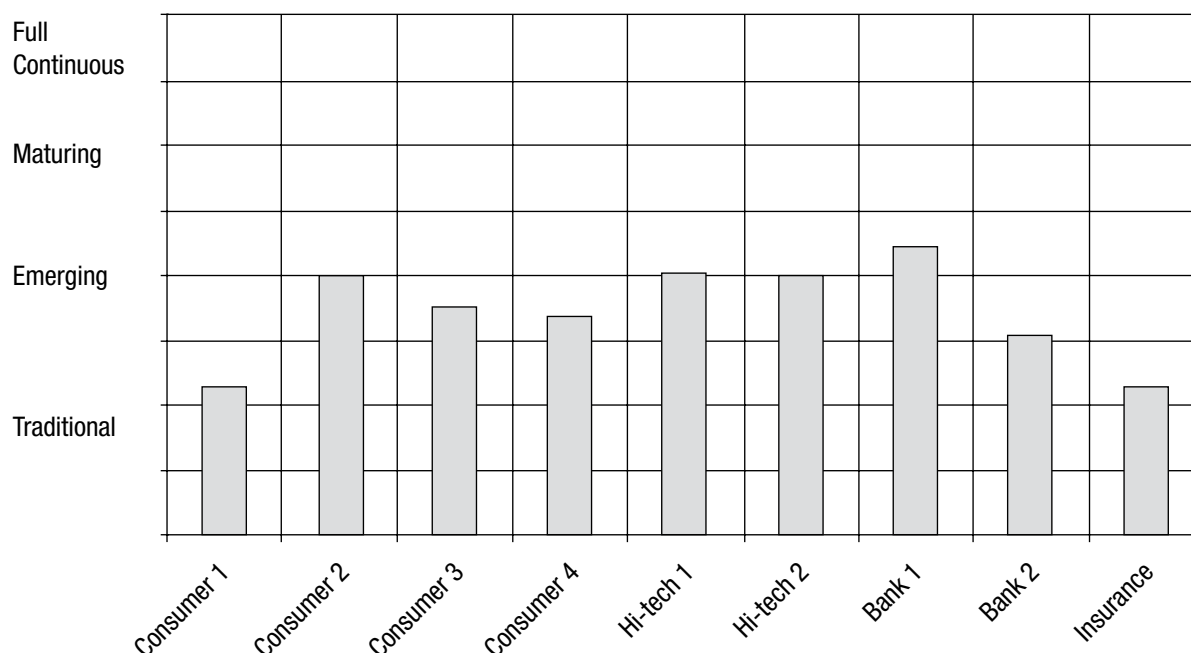
1. **Audit objective**—The scope of audit undertaken by CA systems
2. **Audit approach**—The extent to which audit outputs shift from periodic to continuous
3. **Data access**—The level of access of internal auditors to the firm's data systems
4. **Audit automation**—The degree to which audit processes are automated
5. **Audit and management overlap**—The extent to which internal auditors rely on IT systems intended for use
6. **Management of audit function**—The organizational relationship among IT internal audit, finance audit and other compliance departments
7. **Analytic methods**—The degree of technical sophistication of analytical procedures that internal audit performs

**Figure 1** shows the results of the evaluation of the participating companies according to their performance in the defined seven dimensions. It can be observed that most of the companies are seen in the early stages, ranking from a traditional audit model to a stage in which CA/CM is emerging. This means that, although the interviewed companies have certain levels of CA/CM, they are just in the initiation phases. Consequently, there are opportunities for development in the future.

#### COMPARISON OF THE EXPECTATIONS FOR THE 2008–2012 PERIOD AND THE EVOLUTION OF CA/CM

The PwC CAE survey presented expectations of the evolution of internal audit in the five years immediately following its conclusion. There was some progress toward these expectations according to the CARLAB study. Although the first study reports high levels of adoption of CA/CM at the time of the survey, manual systems were included in the analysis and testing was not done in real time, but was done more frequently than in traditional audits. The survey predicted an increase in the levels of audit automation through technology adoption.

**Figure 1—Levels of Technology Adoption in Leading Internal Audit Organizations**



Another issue encompassed in the predictions and found in the CARLAB study is the need to increase training of employees and managers. It is important that managers react quickly to alerts, and that employees are prepared to use the available tool set. Interviewees in the CARLAB study expressed the importance of training, describing systems in place that include rotation of auditors (as anticipated by the PwC study).

Another expectation for the future is that internal audit responsibilities related to Sarbanes-Oxley would remain level or decline over time. Accordingly, the CARLAB study reports that Sarbanes-Oxley adoption has substantially affected the internal audit departments of the companies, and that CA/CM helps with Sarbanes-Oxley compliance by facilitating review and reducing time of performance.

## CONCLUSIONS

CA/CM has been discussed in the auditing profession for many years, since the initial work at AT&T in the early 1990s.<sup>15</sup> The survey conducted among CAEs in 2007 examined the levels of application of CA in business. Although it found a high rate of CA adoption, a large number of participants in the survey reported that they performed audit manually. Furthermore, they defined monthly and quarterly audits as frequencies of continuous audit. This survey predicted an increase in CA/CM in the ensuing five years, evolving responsibilities of auditors and a globalization effect relative to the auditing role.

With a different approach, the CARLAB study classified the manual audit process and periodic audit as a traditional audit, producing a different evaluation of CA/CM adoption. Most of the companies in the CARLAB study were classified in the emerging stage of CA adoption. The reason for not including them as full continuous audit adopters was that they had only partial audit automation and some key monitoring on a regular basis.

Both surveys found interesting factors that affected the implementation of CA in companies. One of the major factors was a lack of staff capabilities, especially in IT and data analytics—areas that are the core of CA. Participants in both surveys also mentioned that cost was not the major challenge for CA implementation, and that CA efficiently supported Sarbanes-Oxley compliance. Other important factors mentioned were management support, level of access to data, regulatory compliance and audit technology.

All in all, there are different definitions of CA, varying the understanding of CA. Currently, there is demand for faster and better assurance. There are opportunities for the development of CA, given current access to substantially

automated audit technology; however, CA/CM remains in the initial stages of adoption.

## ENDNOTES

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