Continuous Auditing – Internal Audit at a Crossroads?

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Abstract

**Purpose** – It is argued that traditional audit methods are becoming outdated in terms of delivering sufficient assurance on business objectives, whereby, a paradigm shift towards continuous auditing (CA) is proposed and perceived as necessary both by academia, standard-setting groups, and business society. However, the practical prevalence of CA is insignificant in relation to the expectations depicted. Therefore, the purpose of this paper is to examine *why* this is the case by means of investigating what factors that motivate an adoption of CA amongst various internal audit functions (IAFs).

**Design/methodology/approach** – The study draws on the Technology Acceptance Model (TAM), and data are obtained through semi-structured interviews capturing internal auditors’ attitude towards CA, and what factors that influence an adoption.

**Findings** – There is a shattered view on CA amongst IAFs, where the proponents embrace it as a set of value-adding methodologies whilst the opponents argue that it falls outside their responsibility and threaten the independence of the function. Thus, why CA has not been leveraged to its full potential is, in contrast to previous research, not solely attributable to practical factors but also due to the IAFs’ vast differences in approach to CA as a concept.

**Practical implications** – The study has brought attention to the distinguished disparity found in internal auditors’ attitude towards CA. Ultimately, doubts, whether CA should be leveraged by IAFs has come to light. These are hurdles that need to be considered, both by academia, standard-setting groups, and business society if the leap for CA ought to continue.

**Originality/value** – The use of semi-structured interviews contributes to in-depth understandings and insights of the internal auditors’ attitudes towards CA. Moreover, such an approach is more likely to capture the stance towards CA in greater detail than that possible of previous large-scale surveys.

**Keywords** Continuous Auditing (CA), Continuous Monitoring (CM), Continuous Assurance, Internal Auditing, Internal Control, Technology Acceptance Model (TAM), Three Lines of Defense (TLoD)

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Introduction

Technological advancements have made information more available than ever before and the information systems of today are evolving rapidly to meet the needs of tomorrow. Digital tools are used every day, but while digitalisation has come a long way in many respects, it is in its infancy in the field of auditing (Alles et al., 2008, 2013; Chan and Vasarhelyi, 2011). For many years, there has been no approach that utilised all the benefits from digitalisation in this area (Curtis and Payne, 2008). When Luca Pacioli established double-entry accounting in 1494, it was to measure, track and monitor the financial flows to be able to make proper decisions. Indeed, whilst the business flourishes proper accounting becomes increasingly important, and to keep better track over the financial performance some organisations have managed to digitalise and automate their economic processes. This, in turn, has lowered lead times and in many cases eliminated the same (Bierstaker et al., 2001; Warren et al., 2015).

Digital information, in relation to paper-based information, is more timely, accessible, transmittable, transparent and manageable. Therefore, it is not surprising that traditional paper-based sources of information such as purchase orders and invoices are increasingly replaced by electronic counterparts (Warren et al., 2015). The digitalisation and automation have enabled a “now-economy” where the economic activity is accessible in real time and where the accounting serves as a basis for making the right business decisions – just as intended in 1494.

The technological progressions made in the field of accounting evidently provides possibilities in achieving more timely financial information (Alles et al., 2008; Chan and Vasarhelyi, 2011). Utilising information technology through the use of Enterprise Resource Planning Systems (hereafter referred to as ERP) has opened the possibilities of accessing and processing information in a shorter timeframe. Thus, companies that leverage technology are likely to gain benefits in relation to those who do not. This is especially true when it comes to areas of governance, risk management and control (hereafter referred to as GRC) where internal auditors play an important role. However, since management and other stakeholders act on this information it is vital that it is accurate and reliable, this is particularly true in light of the recent recession, but also in corporate scandals such as Enron and WorldCom.

The traditional audit paradigm and its methods are both time consuming and resource intensive which inevitably limits the audit to be a periodic activity. Hence, the traditional
audit paradigm is outdated, owed to inherent inefficiencies in a periodic approach, when it comes to delivering sufficient quality to decision-relevant information (Chan and Vasarhelyi, 2011; Sun et al., 2015). Accordingly, Vasarhelyi and Halper (1991) have proposed a shift where the increased usage of technology affects the traditional audit model in the sense that internal audit would evolve to incorporate a greater scope than before.

Ongoing and timely assurance, or so called, continuous auditing (hereafter referred to as CA) is seen as a tool to provide necessary relevance and reliability to audit findings. CA has, during recent years, been advancing from an academic vision towards a set of audit methodologies utilised in practice – most frequently by internal auditors (Alles et al., 2008). CA is commonly described 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).

Thus, CA is regarded as a concept rather than a specific technological tool – why it is difficult to assess what is meant when companies state that they use CA in their business. With that in mind, it is noteworthy that most of the evidence of CA’s practical prevalence within internal audit functions (hereafter referred to as IAF) is based on non-academic surveys (Deloitte, 2016; KPMG, 2012; PwC, 2006). Therefore, it is not unexpected that the survey findings indicate that CA’s level of adoption is higher than that anticipated by researchers (e.g. Vasarhelyi et al., 2012). The little academic evidence shows, in contrast to the non-academic surveys, that CA is still in its infancy (Rikhardsson and Dull, 2016; Vasarhelyi et al., 2012). However, what both the academic and non-academic research demonstrates is that the awareness of the concept has gained increased importance amongst internal auditors (Deloitte, 2016; Gonzalez et al., 2012a, 2012b; KPMG, 2012; Protiviti, 2016; PwC, 2006; Vasarhelyi et al., 2012). So, in essence, the current level of adoption within IAFs is still low even though CA, for a long time, has been regarded as a top priority for IAFs – a top priority that is clearly pronounced in the following quotation:

“Organisations that are not leveraging these technologies are likely at a tipping point where technology […] will soon require an internal audit function with data analysis, continuous auditing and continuous monitoring capabilities. […] A decade from now, it is very likely that

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1 The first guidance on CA was published jointly by the CICA and AICPA (1999).
companies will not be able to afford to have an internal audit shop without these capabilities in place.” (Protiviti, 2016, p. 31)

The quotation above accentuates a general belief (also found in Deloitte, 2016; KPMG, 2012; PwC, 2006) that CA is regarded as a necessary step in companies’ ability to deliver proper monitoring and assurance on business objectives. Implying that traditional audit methods are becoming gradually obsolete as companies become more complex. This posture is also shared with major standard-setting groups as IIA, SEC and AICPA, which regard CA as a vital component in a set of needed reforms (AICPA, 2015; Coderre, 2005). Moreover, the idea of an increased demand for leveraging technology and expand the use of CA is also something that is shared by prominent researchers in the field (Alles et al., 2004, 2008; Kuhn and Sutton, 2010; Singh et al., 2014; Sun et al., 2015; Vasarhelyi et al., 2010). Despite the positive attitude towards full adoption and application of CA technologies in companies, the practical occurrence of such large-scale adoptions are rare (Vasarhelyi et al., 2012). This is problematic given the perception of CA’s importance for major companies. So why has not CA been adopted to its full potential? A considerable amount of academic research has investigated CA’s business case, mostly in regards to its technical applications and factors that affect CA effectiveness (Singh et al., 2014). Still, the academic research that investigates the narrow uptake of CA in different companies is limited. The few articles that do exist takes either a case study approach (Alles et al., 2006, 2008; Hardy, 2014; Vasarhelyi et al., 2012) or a survey approach (Gonzalez et al., 2012a, 2012b). Evidence from these studies accentuates the importance of factors related to data and information, technical skills and knowledge, and senior management support. However, the articles with a case study approach delimitate the scope towards actual implementations of CA and thus, fails to capture the attitude towards CA amongst internal auditors that have chosen not to use it. In addition, the articles with a survey approach, examining internal auditors’ intentions to use CA, fails to present detailed answers owed to the inherent restrictions in a survey approach. Furthermore, as the IAFs that do not leverage CA has fallen out of the scope of previous studies, it is not self-evident that the lagging adoption of CA could be solely explained by practical factors. In fact, it might be even probable that the answers are more elusive than previously assumed. Consequently, as emphasised by Brown et al. (2007, p. 11), there is an increased need to “carefully document […] critical steps required to implement the audit systems” and further investigate why CA has not been implemented as extensively as predicted.
Research Question

With the main purpose as a backdrop the following research question was chosen:

- Why has the adoption of CA by internal audit functions (IAFs) not held up against expectations from academia, business society and standard-setting groups?

Aim and Contribution

Despite the optimism expressed in both academic and non-academic literature, it seems that the adoption of CA is advancing slowly amongst IAFs. The obvious question is – why? In order to answer the research question, this study seeks to contribute to empirical evidence on the motivation and perceptions of CA in IAFs in large companies in the Nordic countries. Thus, factors that influence the motivation of an adoption of CA by IAFs will be studied in various organisational contexts through an interview approach, and the responses will be analysed through an analytical model grounded on Davis’s (1989) Technology Acceptance Model (TAM). As previous studies do not consider non-adoptions of CA it is possible that such cases might be explained by, if not other, but additional factors. Hence, to increase the chances to discover such factors, the role of the internal auditor is viewed from the perspective of the Three Lines of Defense Model (TLoD) to examine whether the boundaries of the role might have implications for the adoption.

Taking an interview approach contributes to a more elaborative view, compared to previous large-scale surveys, on why, or why not, the studied companies are implementing CA. Therefore, the study is likely to provide useful insights which would be valuable for both practitioners and researchers in their endeavour to make the continuous audit paradigm as efficient as possible.

Disposition

The remainder of this paper is organised as follows. Section 2 describes the literature review Section 3 outline the theoretical approach. Section 4 explains the empirical setting and research design. Section 5 provides the findings and analysis. Section 6 offers concluding remarks.
Literature Review

The following section presents previous research divided into three parts. Firstly, the role of the internal audit is reviewed. Secondly, the internal audit is seen in the light of a broader business context through the lens of the Three Lines of Defense Model. Thirdly, a review of extant research of CA.

The Role of Internal Audit

The Institute of Internal Auditors (hereafter referred to as IIA) defines internal auditing as:

“an independent, objective assurance and consulting activity designed to add value and improve an organisation’s operations. It helps an organisation accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes.” (IIA, 2016)

Hence, internal auditing is described as an important pillar of corporate governance in both private and public organisations as it provides services that are beneficial for the company and its stakeholders (Davidson et al., 2013; Gramling et al., 2004). Internal auditing is conducted in accordance with established international guidelines, on behalf of the board of directors, in order to review and advise on GRC (Sun et al., 2015). Undoubtedly, internal auditing differs from the audit that external auditors offer since internal auditing is not only aimed at revising the financial information but also managing operational information (Pickett, 2011).

The above definition also demonstrates that the internal audit could be divided into two types of activities, namely, assurance services and consulting services. A combination of the two activities is performed to increase the organisation’s ability to achieve its goals (Van Peursem, 2004). Therefore, internal audit is regarded as an activity that is supposed to bring value to the organisation. To fulfil this aim, an internal audit takes a risk-based approach, meaning that the general, as well as the specific risks for the organisation is being assessed and categorised (Ismail, 2010; Pickett, 2011). Internal audits often vary between companies; however, the Professional Practices Framework developed by IIA (hereafter referred to as PPF) directs the internal auditor (O’Reagan, 2003). Thus, the purpose of IIA is to act as a common ground for internal audit professionals and to provide a framework for internal audit activities.
In recent years the role of the internal auditor has undergone a shift towards a more proactive and value-adding role (Bou Raad, 2000; Eulerich et al., 2013). However, balancing the interests of management and the board of directors are not always an easy task, despite having the PPF as guidance (Van Peursem, 2005). In a report published by IIA (2003), it is argued that internal auditing is not generic, but varies depending on to whom the function reports. Some report to the operational management, while others report to senior executives at the company. Implying that various clients usually are interested in different internal audit services, which poses a risk of ambiguity in the internal audit mission and role (IIA, 2003). Criticism is often directed against the internal auditors in that they are not completely independent and autonomous in relation to management (Sarens and De Beelde, 2006). Hence, for the independence and autonomy to be tolerably preserved internal auditors should report to an audit committee (Gray and Manson, 2005). The audit committee shall monitor the work of the executive management and preserve full and efficient control over the company (Christopher et al., 2009). The committee’s role is to oversee the company’s financial reporting process and the company’s internal control.

**Internal Audit in The Business Landscape – Three Lines of Defense**

Companies’ efforts to organise its risk management continues to receive its deserved attention as organisational complexity and risk exposure increases (Davidson et al., 2013). A widely accepted model for risk management is the Three Lines of Defense Model (hereafter referred to as TLoD). The model has become increasingly popular in the development of corporate risk management. One reason for the model’s growing application is likely to be found in its simplicity (IIA, 2013). It clarifies who is responsible for what regarding risk management and internal control – an important question, as it often appears to be unclear in this area (Chambers and Odar, 2015).

The first defense line consists of the management and business operations. This means it is responsible for managing risks and maintaining effective internal control (Eulerich et al., 2013). The first line of responsibility is related to the company’s formal hierarchy that is in charge of groups, companies, subsidiaries, business units, and departments. Maintaining a sustainable risk culture is the first line’s responsibility (IIA, 2013).

The second defense line is usually more functionally oriented. This refers to features that work specifically with monitoring risk. These functions should not be responsible for the
business rather they should act as supportive and supervisory functions. The second line has evolved significantly in recent years – to the benefit of both the first and third line (IIA, 2013). It primarily consists of risk control and compliance, but other features may be included, depending on nature and character (Eulerich et al., 2013). These features help to develop processes around risk management and internal control, but they are also responsible for monitoring the first line’ work. They can be described as a combination of watchdog and trusted advisor.

The third line is functionally oriented and mainly consists of the IAF. The IAF is working on behalf of the board of directors and review the work of the first and second line (Eulerich et al., 2013). While the second line may be somewhat limited in its autonomy in relation to the first line of responsibility, the third line should be more independent of the activities it is set to review (IIA, 2013).

So, why do we need multiple defense lines? In a perfect business, no second or third line is required – only the first line: risk management, governance, and control. One can compare to a football game where one team is superior, meaning, no defense is needed. Unfortunately, there are few perfect organisations with infallible systems and processes, why errors occur. Thus, additional defense lines are required for monitoring of the operational managements dealing with risks and opportunities. Evidently, according to IIA (2013), an IAF has its given place within the modern, large, and complex company. The diversity of tasks that an IAF has enable a broad perspective on the business, which makes it a valuable resource for the same (Bou Raad, 2000; Eulerich et al., 2013). As presented above, internal auditing is not solely related to assessing risks, but also to evaluate future technologies; assess controls, ethics, quality, and efficiency; ensure that controls are adequate to reduce the risks; examine global issues affecting the company; analysing possibilities (Gramling et al., 2004). However, as the scope of the internal audit agenda consumes resources, they need to be allocated wisely (Pickett, 2003). Thus, it is argued that if internal audit leverage CA the scope can be maintained or even widened, in contrast to what continuing with traditional audit approach would purport (Vasarhelyi et al., 2012).

**Continuous Auditing**

From the perspective of the internal auditor, the goal of CA is to simplify the procedure of providing timely assurance on that business processes are well-controlled and complies with
the business’s objectives (Teeter, 2014). Additionally, it is a way to provide the company’s management with useful financial information that is both timely and accurate (Chan and Vasarhelyi, 2011). Evidently, if the financial information could not be relied upon it increases investors’ uncertainty, resulting in a lower stock price (Miller, 2002). Thus, if proper assurance is in place, it will ultimately lower the cost of capital and lower external audit fees (Brown et al., 2007). The development of auditing services has not kept pace with the improvements of accounting information systems, and the majority of the auditing conducted at this date is based on manual audit procedures (Chan and Vasarhelyi, 2011). Hence, much time and effort need to be put into the audit, which in turn limits the frequency of the same (Elliot, 2002). CA methodologies are far less labour intensive and thus have the possibility of reducing the current constraints enabling a timelier assurance (Gonzalez, 2012a).

CA has been discussed in the literature since the beginning of the 1990s (e.g. Groomer and Murthy, 1989; Vasarhelyi and Halper, 1991), but it is not until recently that internal auditors have had the possibility of truly accessing relevant information and at the same time being able to process it (Chiu et al., 2014; Brown et al., 2007). The reason for this is mainly an outcome of the digital transformation and the ability to analyse large amounts of data through the help of assisting software (Bierstaker et al., 2001; Warren et al., 2015). Along with these possibilities, the pressure on internal auditors is increasing, most visible in senior management’s request of ongoing assessments rather than periodic reviews (Hardy and Laslett, 2015). Thus, the role of the internal auditor has slightly changed from audit control activities to incorporate a greater scope where the risk profile and general improvement of the risk management processes need to be considered (Bou Raad, 2000; Eulerich et al., 2013). Essentially, CA gives internal auditors the possibility to go beyond the boundaries set by the traditional audit approach i.e. point in time assessments and limited sample selections (Davidson et al., 2013).

Certainly, the anticipated benefits of an execution of CA are evident; nonetheless, the term itself needs to be further clarified. The IIA refers to CA as a framework containing a set of activities undertaken by internal auditors used for evaluating the GRC of a company (Coderre, 2005). Furthermore, CICA/AICPA’s (1999) definition of CA limits the assurance to written assurances; however, previous studies such as Rikhardsson and Dull (2016) describe CA as “the methodologies, processes and technologies that enable real-time or close to real-time assurance on a specific subject matter.” (p. 27). This definition is broader and
thus incorporate a greater set of methodologies and tools that can be regarded as CA. The proposed stance is also more in line with that proposed by IIA, namely; “any method used by auditors to perform audit-related activities on a more continuous or continual basis” (Coderre, 2005, p. 7). Likewise, as described by Hardy (2011, 2014) there are different meanings assigned to the term continuous in CA e.g. through the lens of the traditional audit paradigm, implying, more frequent audits; or through the lens of the continuous audit paradigm, implying, continuous as in ongoing. This paper looks at the term as an ongoing audit whereby only exceptions are reported to the internal auditor, which could be depicted in the following example: automated audit programs perform analytical procedures on the company’s accounts e.g. accounts receivable. If exceptions occur that violates the predetermined parameters e.g. significantly lower account balances than the previous period, an email is sent to the internal auditor with a report on the exceptions (Coderre, 2015). Furthermore, the audit program can go beyond the account balance level and investigate data on transaction level whereby it can report back and highlight the cause of the problem.

As the example above inherently portrays, an IAF needs appropriate IT infrastructure and controls in place to leverage CA (Rezaee et al., 2002). Relating to CA’s dependence on controls, there is an important distinction to be made between CA and a relating concept, namely, that of Continuous Monitoring (hereafter referred to as CM). CM is defined by IIA as:

“a process that management puts in place to ensure that its policies, procedures, and business processes are operating effectively […] and typically involves the automated testing of all transactions and system activities, within a given business area, against a suite of controls rules” (Coderre, 2005, p. 8).

Unmistakably, CA and CM is closely related to each other; nonetheless, CM is implemented and used by management as opposed to CA that is applied by the IAF (Davidson et al., 2013). Furthermore, there is an inverse relationship between CA and CM, which is evident in Figure 1. Better monitoring of internal controls by management leads to fewer resources spent by internal audit since CA techniques could be effortlessly employed when CM is in place. In fact, Coderre (2005) argue that internal auditors should take on a more proactive role when it comes to establishing CM, yet, it is important that the ownership is entitled to management so that independence issues do not arise.
Unfortunately, CA is occasionally misunderstood as being something solely related to management’s responsibility (Hardy, 2014). This is, according to AICPA and IIA, incorrect as CA is strictly attributable to internal auditors’ responsibility just as CM is strictly attributable to management’s responsibility (Hardy and Laslett, 2015). Oftentimes these two terms are collectively referred to as continuous assurance (Coderre, 2005). Hence, management holds a valuable role in establishing and monitoring controls and thereby managing risks. At the same time the internal auditors, the objective third party, audit the CM and ensure that it operates appropriately. However, when the Swedish branch of IIA states that CA is not about internal auditing but ongoing monitoring, and ultimately the responsibility of management (Forssblad, 2009, p. 20); there is a dilemma clearly signalling the ambiguity in the two terms.

The research within the field of CA could be divided into five major categories, namely, demand factors, theory and guidance, enabling technologies, applications, and impacts (Brown et al., 2007). Since this paper will focus on the perception of CA held by internal auditors it is central to discuss the current research on demand factors, applications, and impacts.
Theoretical Approach

The following section presents the theoretical approach and analytical model of the study. Firstly, three perspectives of CA are presented (motivation, application, impact) that are assumed to be linked to the attitude formation. Secondly, Davis’s (1989) Technology Acceptance Model (TAM) is presented. Lastly, the analytical model, jointly constructed based on the three perspectives and the TAM model, is outlined.

Motivation Perspective

The CA concept has gained increased awareness as the technology has advanced. In some cases, yet few, it has gone from solely being a concept in theory to be applied in practice (Alles et al., 2006, 2008; Hardy, 2011). Evidence from non-academic surveys has come to some conclusions in regards to the limited uptake, namely; lack of a clear description of how to operationalise CA; inadequate understanding of the obtainability, as well as functionality, of CA (Hardy, 2014). Add to that, the ambiguity that still surrounds CA despite the extensive literature written on the topic (Hardy, 2014). CA research has mainly focused on theoretical developments, frameworks and possible techniques of CA (Brown et al., 2007). Nonetheless, there is a limited theory that takes on CA adoption, implementation and impacts (Hardy, 2011; Gonzalez et al., 2012b; Richardson and Dull, 2016; Vasarhelyi et al., 2012). The limited theory that does exist does not, in contrast to most other studies, take the CA adoption for granted. Indeed, it is common that the implementation of CA is assumed to be straightforward and that the need for CA is recognised (Hardy, 2014). However, as the slow progression of CA in practice reveals, such stance might be harmful as it fails to incorporate a complete picture on why (not) companies adopt CA. The few studies that investigate the motivation for an adoption of CA has, for the most part, been from the United States (Alles et al., 2006, 2008; Gonzalez et al., 2012b; Vasarhelyi et al., 2012). Both Vasarhelyi et al. (2012) and Gonzalez et al. (2012b) draw inspiration from the Technology Acceptance Model (TAM) and its descendants, meaning that the attitude towards CA is grounded in its perceived usefulness and perceived ease of use. Evidence from these studies highlights the significance around factors related to data and information; technical skills and knowledge; and senior management support. Other factors that are likely to influence the CA adoption are provided by Gonzalez et al. (2012a), in their survey of the adoption of CA in large companies they found that two factors were especially important, namely, effort expectancy and social
influence. Where effort expectancy is the perceived ease of use, and social influence is the support and encouragement from other key members of the organisation.

Additional research shows that CA could play a valuable role when it comes to aligning information technology with strategic objectives which enable management to be better able to measure the operational performance (Rikhardsson and Dull, 2016; Gonzalez et al., 2012a). Rezaee et al. (2012) argue, in line with Elliott (2002), that the aspiration for more frequent financial reporting is one of the demand factors behind an adoption of CA. Furthermore, at the same time as businesses have become increasingly sophisticated e.g. through expansions across borders, decentralisation, and outsourcing of functions, it has resulted in an increased need of scrutinising the transactions (Greenstein and Ray, 2002; Vasarhelyi et al., 2004). Still, the motivational factors for adopting CA are often categorised as economic or compliance related (Rikhardsson and Dull, 2016; Vasarhelyi et al., 2012; Davidson et al., 2013).

Economic motivation could entail both improved audit efficiency as well as a reduction in audit times, which allow an IAF to expand their scope beyond what was previously possible (Alles et al., 2008). In addition, CA could lower external audit costs due to better risk and internal control follow-up (Rezaee et al., 2002).

Compliance related factors could also be a demand factor of CA as it has the possibility of discovering inaccuracies within the internal control systems. The increased complexity of the regulatory environment has therefore served as a catalyst for audit procedures beyond the traditional audit method (Vasarhelyi et al. 2004). In fact, Harrison (2005) argues that CA is the only way to meet the needs for compliance that is imposed on the companies from regulators.

**Application Perspective**

As CA involves different processes than those of the traditional audit, this affects a whole set of activities. One of the earliest studies that address the application of CA in practice is Vasarhelyi and Halper (1991). The authors stress that a transition from the traditional audit approach to CA goes beyond the implementation of new programmes – changes to the control environment are seen as necessary. A common recommendation is that internal auditors should implement CA on a small scale before launching it on a large scale e.g. on
accounts payable or issues concerning separation of duties (Boccasam and Kapoor, 2003; Potla, 2003). It is clear that CA could be deployed in various types of businesses as well as processes (Brown et al., 2007). However, since CA is so different from the traditional audit approach an implementation leads to certain impacts. One of which is the initial setup costs of CA (Brown et al., 2007). However, with the trend towards progressively affordable technology in regards to storage and computer power this is perhaps changing.

The research within the field of CA provides several suggestions for applications of CA Technologies (Alles et al., 2008; Groomer and Murthy, 2003; Vasarhelyi et al., 2004). Bumgarner and Vasarhelyi (2015) presents an updated CA applications framework originally developed by Alles et al. (2004). The framework divides the application of CA into four levels which range from simple to more complex applications.

1. Continuous Data Audit (CDA): verifies the reliability of data, down to transaction level, that flows between different systems and databases. Often entail a software that has the capability to provide analytical procedures based on expectation models.

2. Continuous Control Monitoring (CCM): consists of a set of techniques that provide assurance that internal controls are functioning properly. In order to be effective and increase data integrity, it is often complemented with CDA.

3. Continuous Risk Monitoring and Assessment (CRMA): uses algorithms and probability models for dynamically evaluate and measure risks which serve as input for audit planning.

4. Continuous Compliance Monitoring (CCMO): similar to CRMA although CCMO creates taxonomies of compliance matters and monitors the compliance with law and regulation.

The application and implementation of CA should, according to Chan and Vasarhelyi (2011), follow four stages. Firstly, the internal auditor defines a business process which permits the use of CA. Secondly, the business process is further examined to identify the previous audit process. Different types of monitoring are then tested to discover if the change in audit approach can be formalised. In this stage, data modelling is used to develop benchmarks for future transactions and account balances. The benchmarks are then used to determine what constitutes the normal operations. Thirdly, data analysis is used to examine internal controls, transaction data and account balances against the established benchmarks. Any deviation that
occurs is flagged and made aware of in order to be further examined. Lastly, if not exception reports are created a clean audit report can be issued since it is considered to be free from material errors. Alternatively, if exceptions are found they need to be resolved and approved by the internal auditor.

**Impact Perspective**

CA is according to Chan and Vasarhelyi (2011) most used by IAFs where it enables large amounts of information to be frequently assessed. However, according to Lombardi et al. (2014), there is a consensus in the CA literature that automation will not be able to replace human judgment completely. CA extends the control and assurance activities by the help of increased automation, which alters the audit approach from reactive to detective (Alles et al., 2006; Rikhardsson and Dull, 2016). The improved reliability that CA bestows to the processed information also enhance the confidence, and in turn the quality, of managers and other employees in their decision-making (Vasarhelyi et al., 2012; Rikhardsson and Dull, 2016).

Presently, there is a substantial difference between a company’s internal information and the information available to external parties (Krahel and Vasarhelyi, 2014). The internally communicated information that serves as a basis for ongoing decision-making for management is frequent but brief. As opposed to externally presented information that is extensive but less frequent. Krahel and Vasarhelyi (2014) argue that the improvement of ERP systems along with automated control systems and the increased amount of transactions have driven the use of CA in practice. CA can be used to detect patterns in large quantities of data and as a business intelligence tool e.g. to analyse consumption patterns and to manage stock. CA also allows the internal auditors to assess whether the patterns are in line with expectations. Thus, the auditors can detect deviations from expectations of large amounts of data, and in return target the audit to make better use of their limited resources. It is argued that the value of CA comes down to the relationship between assurance cost and assurance quality (Rikhardsson and Dull, 2016; Power, 1997). Evidently, if CA increases the effectiveness and efficiency of the audit processes at the same time as it reduces the costs of compliance and cost of internal control, it adds business value (Alles et al., 2012; Chan and Vasarhelyi, 2011, Rikhardsson and Dull, 2016), where business value is measured in terms of increased productivity in relation to costs (Rikhardsson and Dull, 2016).
Despite the probability of CA adding business value a common concern around the adoption of CA is that the auditor might be lavished by the information and the systems that signal outliers (Kuhn and Sutton, 2010). This can become a major problem after an implementation before the monitoring is modified and adjusted. As a consequence, it is important that the internal auditor has the possibility of changing the parameters or even deactivate certain elements at specific times (Kuhn and Sutton, 2010).

**Technology Acceptance Model**

Information technology is constantly evolving, and in the process, new opportunities and tools for the user arise. In some cases, the use of the technology is forced upon the user whilst in other cases, it is the user’s choice. Depending on how the user chooses to accept the new technology the result from it could deviate from results of others. As this paper seeks to contribute to an enriched understanding of the lagging progression of CA, it is vital to distinguish what drives the acceptance of CA methodologies.

A model of the relationship between usage and experience is the Technology Acceptance Model (hereafter referred to as TAM) – a model that has been utilised in hundreds of research papers since its initial publication (Bagozzi, 2007). TAM is developed by Davis (1989) and derived from the Theory of Reasoned Action developed by Fishbein and Ajzen (Legris et al., 2003). TAM is aimed to explain and predict individual behaviour in the face of new technology. Davis suggests a relationship based on perceived ease of use (hereafter referred to as PEU) and perceived usefulness (hereafter referred to as PU) that affects the attitude towards the new technology, and how it can influence intentions to use the new technology. Davis (1989) shows that a user who is experiencing the benefit of the work of the technology is also increasingly willing to use it. However, a high level of PU does not solely guarantee that the technology will be utilised, the PEU also plays an important part as it can negatively affect the use of the technology. The intentions to use the new technology is influenced to a larger extent if it has got a high level of PEU.

PEU refers to the degree to which the intended user deems to use the application without any apparent effort or difficulty (Davis, 1989). A higher PEU entails a greater level of acceptance which in turn positively affect the chance to continue using the technology (Zhang and Xu, 2011). Furthermore, it is argued that a technology that is easier to use than other available technologies be more likely to be adopted by prospective users (Davis, 1989).
In contrast to PEU, PU describes the degree to which the intended user believes that the use of a specific technology affects the individual’s work for the better in a specific context (Davis, 1989). When the prospective user experiences a greater benefit in their work situation, this increases the possibility of a greater willingness to use the technology (Zhang and Xu, 2011). Davis (1989) clarifies this by stating that a high degree of perceived benefits is created when users see a positive relationship between usage and performance. Therefore, it is important, in an examination of the attitude towards CA, to determine if the methods are considered to be useful or not and to assess whether its usefulness is related to the acceptance of it. The technology that is easiest to use has, according to Davis (1989), an advantage when it comes to the acceptance of potential users. Evidently, there are two audit approaches, traditional audit and CA methodologies, where the traditional audit is most commonly used. Therefore, if CA would be considered to be difficult to use, it will according to this theory affect its acceptance as many have already become accustomed to the traditional audit approach.

**Analytical Model**

The model below is derived from the TAM model and consists of four steps. The perceived usefulness (PU) and perceived ease of use (PEU) jointly construct the internal auditor’s intentions to use CA (Davis, 1989). Accordingly, the intentions lead to an action i.e. an adoption or a rejection of CA. Furthermore, the three perspectives presented above could also be found in Figure 2, where motivation is part in the intentions to use box and applications and impacts is part of the external factors box. Hence, it is believed that the internal auditors’ awareness of possible applications of CA and the impacts that follow serves as a foundation for attitude formation.

![Analytical Model Diagram](image)

*Figure 2. Depicts the analytical model which propose that PEU and PU affects the intentions to adopt CA*
Empirical Setting and Research Design

The following section explains the research process and the method chosen. It is divided into empirical setting, philosophical framework and research design, data generation method, data analysis method, research ethics, limitations of research, and theoretical generalisability.

Empirical Setting

This study seeks to investigate why the actual implementation of CA amongst IAFs, deviates from the expectations depicted by academia, business society and standard-setting groups. Therefore, factors that influence the motivation of an adoption and application of CA by IAFs needs to be further assessed.

The study is directed towards internal auditors at large companies in Sweden, Denmark and Finland and examines internal auditors’ motivation towards adopting CA. The explanation for why the study focuses on IAFs amongst large companies is simply connected to the fact that these are companies that are most likely to have an IAF due to their size, and regulatory requirements. As for the definition of what constitutes a large company, this study considers companies with a yearly revenue of more than one billion SEK and more than a thousand employees to be regarded as large companies. Following the consensus (e.g. Rikhardsson and Dull, 2016) of previous studies that large companies have many compliance requirements and stringent financial reporting requirements.

For the interviews to be meaningful in relation to the aim of the paper it was important that the respondents had a detailed insight into the IAF and preferably of the concept of CA, proposing a so-called expert selection (Saunders et al., 2012). To ensure this, respondents were chosen based on their professional position. Nonetheless, it should be added that a convenience aspect also was considered in the selection process of respondents, implying that the access and availability to the same were prioritised. The majority of the respondents were chosen based on whether there were Certified Internal Auditors of the IIA – information that is accessible on IIA’s homepage. Information gathered from respondents in companies that have not yet adopted CA are still relevant – as reasons to a non-adoption of CA could be further examined. In total there were ten interviews with respondents in five different industries, see Table 1 for a respondent overview.
Table 1
Respondent overview

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry</th>
<th>Respondent</th>
<th>Duration of interview</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Financial</td>
<td>Chief Internal Auditor</td>
<td>60 minutes</td>
<td>2017-03-09</td>
<td></td>
</tr>
<tr>
<td>2. Industrial</td>
<td>Internal Auditor</td>
<td>60 minutes</td>
<td>2017-03-09</td>
<td></td>
</tr>
<tr>
<td>3. Industrial</td>
<td>Chief Audit Executive</td>
<td>60 minutes</td>
<td>2017-03-15</td>
<td></td>
</tr>
<tr>
<td>4. Insurance</td>
<td>Chief Audit Executive</td>
<td>60 minutes</td>
<td>2017-03-15</td>
<td></td>
</tr>
<tr>
<td>5. Consumer Staples</td>
<td>Internal Auditor</td>
<td>50 minutes</td>
<td>2017-03-16</td>
<td></td>
</tr>
<tr>
<td>6. Industrial</td>
<td>Chief Audit Executive</td>
<td>50 minutes</td>
<td>2017-03-16</td>
<td></td>
</tr>
<tr>
<td>7. Consultancy</td>
<td>Internal Auditor</td>
<td>45 minutes</td>
<td>2017-03-17</td>
<td></td>
</tr>
<tr>
<td>8. Transportation</td>
<td>Chief Audit Executive</td>
<td>60 minutes</td>
<td>2017-03-17</td>
<td></td>
</tr>
<tr>
<td>9. Industrial</td>
<td>Group Audit Manager</td>
<td>60 minutes</td>
<td>2017-03-21</td>
<td></td>
</tr>
<tr>
<td>10. Financial</td>
<td>Internal Auditor</td>
<td>50 minutes</td>
<td>2017-04-18</td>
<td></td>
</tr>
</tbody>
</table>

Philosophical Framework and Research Design

Knowledge production which claims to be scientific has to clarify the ontological and epistemological nature i.e. regarding what kind of value (ontology) to seek and what kind of knowledge (epistemology) – and not only how to proceed (practical method). This paper builds upon an interpretivist viewpoint i.e. it proposes an attempt to comprehend a phenomenon through retrieving the meanings participants assign to it (Orlikowski and Baroudi, 1991). Furthermore, it is based on the subjectivist assumption that reality is created within the social context (Bryman and Bell, 2015).

The paper applies an interpretivist approach where interpretation is held as the principal research method. The interpretivist approach is common in the field of social sciences as it is based on interpreting essential phenomenon (Gilje and Grime, 2007). Thus, it is not aimed to search for the absolute truth; according to interpretivist approach there is no such truth. As the information collected consists of interpretations by other individuals’ understandings, it has been a continuous attempt to explain the information in a comprehensible manner and to facilitate the readers’ understanding. Simplicity and comprehensibility have therefore been two essential characteristics of this study. The interpretation of the respondents’ answers has been supported by supplementary questions sent to respondents to clarify their answers when perceived as vague. Although prejudices based on previous experience and knowledge always affects the interpretation of the empirical data to some degree, a professional neutrality has been a key factor throughout.
It is possible to examine the opportunities and challenges businesses face in several ways; it is all subject to the desired orientation or perception of the research itself. Previous surveys that have investigated the level of adoption of CA across different organisations have chosen the survey approach in which a general outlook is developed (Deloitte, 2016; Gonzalez et al., 2012b; KPMG, 2012; Protiviti, 2016; PwC, 2006). However, since this study seeks to investigate the details in regards to why (not) IAF leverage CA the survey based approach is insufficient as it fails to portray the details (Clegg et al., 1997). The chosen perspective in this study will, in contrast to a survey, assist to gain insights into the internal auditors’ motivation towards an adoption of CA and to a greater extent disclose the elements that contribute to the same (Jepperson and Meyer, 2011). Although, it is important to point out that various methodological approaches often are interconnected, meaning to get an extended picture of a matter different approaches should be investigated. In this line of research, the distinction is rather clear, the macro-level approach is widely fulfilled by existing surveys, whereas, the micro-level assessment is understudied.

**Data Generation Method**

For the purpose of the paper, a qualitative method is used since the aim concerns different companies’ experiences of CA and their view of reality. Traditionally, it is typical to connect a qualitative research design to an inductive approach i.e. an approach that seeks theory formation. The qualitative research design goes hand in hand with the interpretivist approach i.e. the focus is on how individuals perceive and interpret their social reality (Bryman and Bell, 2015). Qualitative research is characterised by providing, through a narrow focus, an in-depth investigation – the less is more (McCracken, 1988, p. 17). It is often based on how individuals perceive and interpret the ever-changing environment that surrounds them (Bryman and Bell, 2015). An advantage of the approach is that it becomes possible to get a deeper and more precise analysis of events and processes that may be critical for the organisation’s actions (Bryman and Bell, 2015). On the other hand, the downside of such an approach is that the results will suffer in terms of generalisability (Yin, 2003). However, since the generalisability is not the overarching goal of this paper, but rather to get an enriched picture of the motivational factors of CA, it is argued to be a suitable approach.

When the topic of the study was chosen connections were made with professionals with insights into the area. Namely, two professionals on audit automation and development on Big4 accounting firms, one professional at FAR (i.e. the institute for the accountancy
profession in Sweden), and a distinguished researcher in the field of CA. This was done to get a better and more detailed overview of the subject. It is also insights from these conversations that resulted in the discovery of an interesting research problem which then culminated in this study.

The collection of primary data takes place through semi-structured interviews since a flexible dialogue is preferred in which follow-up questions can be used for the respondent to expand and develop his or her responses (Bryman and Bell, 2015). In order to increase clarity in the paper, the findings and analysis section is divided into three perspectives following the analytical model. Similar categorisation has been made in a previous study by Rikhardsson and Dull (2016) which investigate related questions, although, with some important distinctions where one is that it focuses on small businesses as opposed to large ones. Still, the perspectives should not be regarded as exhaustive, rather, they function as an analytical frame. Clearly, even though distinctions are made through such separation, the perspectives are of course interrelated.

The respondents’ answers were audio recorded to allow an active and engaging discussion where full participation from the interviewer was maintained. Although, this was done in agreement with the respondent, which had the opportunity to deny recording. A semi-structured interview usually contains an interview guide in order to direct focus to areas of importance to the topic (Bryman and Bell, 2015). This was designed with the analytical model as a backdrop and ensured that empirical data could be obtained in a structured way. The interview guide contains a set of introductory questions that aims to provide some background knowledge of the respondent; however, these questions also serve as a relaxing start to the interview. Subsequent to the introductory questions is a set of questions organised around the three perspectives. Lastly, a few questions relating to the future of CA is presented. The interview guide is enclosed in Appendices. Along with the questions in each area, sufficient time was set aside for follow-up questions when necessary. An interview guide is especially important in this type of study to achieve consistency since the interviews were held at different companies at various points in time (Bryman and Bell, 2015).

**Data Analysis Method**

Davis (1989) surveyed the attitude held by 112 IBM employees to an email program. Davis (1989) asked them twenty questions, ten of which related to perceived usefulness (PU) and
ten related to perceived ease of use (PEU). The questions were asked assuming that the electronic mail would be available for the respondents. For example, questions on PU could be: “Using electronic mail enhances my effectiveness on the job.” (p. 324), whereas question on PEU could be: “The electronic mail system is rigid and inflexible to interact with” (p. 324).

In contrast to Davis (1989), this study draws significant strength from its approach with semi-structured interviews. Employing such mechanistic questions as those posed by Davis would have been counterproductive; as this study seek to develop a deeper and enriched understanding of attitudes towards CA this usually requires the flexibility of semi-structured interviews (Bryman and Bell, 2015). Undoubtedly, this means that the answers cannot be statistically assured, but on the other hand, it is not either the intent of this study. Accordingly, the TAM model cannot be applied as it typically has been in earlier studies (e.g. Gonzalez et al., 2012b), as it is developed and intended to be used on a standardised set of questions. Nonetheless, this does not diminish its relevance, as TAM remains the basis for a view on the relationship between acceptance and adoption that this study share. Instead, the TAM model, via the analytical model, is employed to the extent that it directs the interview guide – in conformity with Vasarhelyi et al. (2012).

As mentioned above, an interview guide was used containing three perspectives. The first perspective, motivation, connects the literature section with the empirical data in the way that the previous factors of motivation found in earlier studies could be compared to the factors found amongst the respondents of this study. The second perspective, application, enable insights on the awareness of CA applications amongst the respondents which, according to the analytical model, affect the motivation towards CA. Similar to this is the third perspective, impacts, whereby the perceived impacts of CA is assessed amongst the respondents. Hence, investigating CA from a perspective of application and impact supports the creation of an understanding of whether there is a knowledge gap between theory and practice in these two areas that conceivably affect the motivation towards an adoption of CA.

The analytical model was used as a foundation for the interpretation of the data as each perspective was linked to certain interview questions (see interview guide in Appendices). The answers from the respondents were transcribed and analysed based on the three perspectives through the means of thematic analysis (Bryman and Bell, 2015). The thematic
analysis was divided into two steps, firstly, answers or part of answers that were not relevant in relation to the research question were excluded. The answers which were relevant from each interview were mapped into applicable perspective and given a time reference in the audio file. Thus, since the answers were structured based on perspective, each interview could be overviewed in a comprehensible manner. Secondly, the answers from each interview were summarised and merged into a common document where it could be further examined. Consequently, in this step, it was possible to discover agreements, as well as disagreements, in the respondents’ answers which were then delineated in the findings and analysis section with the author’s own words strengthen by respondents’ quotations. Hence, the theoretical and practical contribution was developed through an assessment of the respondents’ answers in relation to the previous literature on the topic.

**Research Ethics**

Ethical challenges and dilemmas always arise when studying people (Ritchie et al., 2014). However, to ensure that such issues could be minimised several actions has been deployed. All of the respondents have given their consent to partake in the study, and all answers have been anonymised so that the respondents do not suffer from their participation. Some of the interviews were held in Swedish which leads to that quotes in Swedish had to be translated into English imposing a risk of misstatements and mistranslations of the empirical data. Therefore, each respondent had the opportunity to read through their quotes before publishing, thus, enabling a possibility of correcting errors. Similar also holds true for the interviews that were held in English as equal risks of misstatements were plausible. The confirmation of respondents’ answers, or so-called respondent validation, is a recommended method by Bryman and Bell (2015) to improve the validity of the study.

**Limitations of Research**

This study, as in any study, suffers from limitations. For example, it is possible that the adoption and application of CA are lagging due to factors other than the attitude and willingness of internal auditors. Yet, some considerations in regards to limitations had to be made, therefore, since the IAF is populated by internal auditors they are believed to best explain how various changes influence the internal audit.
Theoretical Generalisability

The perceived quality of qualitative research is based on its credibility (Bryman and Bell, 2015). In addition, credibility is based on four sub-criteria; namely, reliability i.e. how likely or probable the results are. Transferability i.e. whether the results can be applied to other contexts. Validity i.e. if the results are similar at another point in time. Objectivity i.e. that the researchers did not interfere in a way that affects the results. The reliability has been ensured by the use of a wide variety of scientific articles which all have been peer-reviewed in renowned journals. However, as for most qualitative studies transferability is suffering; still, the main purpose of the study is not to provide results that could be generalised to the population. The validity has been strengthened by an accurate description of the conducted research, and that the research strategy is well-reasoned as well as the selection of respondents. The objectivity has, to the extent possible, been upheld by the help of the interview guide.
Findings and Analysis

The following section presents the empirical data together with the analysis. The empirical data and analysis attributable to internal audit and technology is subsequently followed by empirical data and analysis related to each perspective. Thereafter follows a brief analysis of the findings in light of the TAM model. The section ends with a summary of the analysis identifying the main findings.

Internal Audit and Technology

A general recapitulation from the interviews is that it is important to recognise that the work of IAFs could vary between different companies, confirming O’Reagan (2003).

“[…] it might be a good idea here to recognise that there are very different setups for different companies.” (Company 1)

Hence, there may be situations where CA are more or less attainable e.g. there is Company 7, a consultancy firm that organises the IAF at various financial companies. Company 7 has a difficult time establishing such solutions: “The big problem is usually getting the data” (Company 7). Another aspect is how the internal auditors look at themselves in relation to the business. In line with the literature (e.g. IIA, 2013), the majority of the respondents choose to identify the IAF based on the TLoD model, whereby, each line of defense has responsibility for control that does not transfer to the next line. In other words, the first line has to be able to control everything fully without the advice from the second line. The same applies to the relationship between the second and third line. Hence, the third line of defense, i.e. the IAF, operates on a high level where it is overviewing the overall framework of GRC.

“You should be able to remove both second and third line, and everything should work anyway [...] regardless if risk control and compliance, and internal audit went out the door and never came back.” (Company 7)

In general, the expectation is that daily and monthly monitoring activities are done by the first and second line and that the internal audit is still focusing on monthly or yearly reviews. This, however, does not imply that the various lines of defenses do not cooperate e.g. there is a frequent mediation of improvements communicated by the IAF to the second line, as depicted in the following quotation:
“Very frequently we will turn over the scripts and data that we have gotten to the second line and they will integrate them into the ongoing monitoring, as opposed to internal audit to carry on maintaining and monitoring.” (Company 1)

Despite the fact that the respondents are working in different sectors the setup of the IAF is similar, although the number of staff is varying. The staff is also geographically spread depending on where the company conducts business. The work of the IAFs is conducted in line with PPF, and the audits are prioritised with the help of risk assessments – just as described in the literature (e.g. O’Reagan, 2003). Accordingly, the respondents describe the IAF as an independent function of the business as it reports directly to the audit committee, consisting of selected members of the board of directors. In other words, all of the companies in question have an audit committee whose main responsibility is to ensure efficient control over the company, confirming Gray and Manson (2005) and Christopher et al. (2009). Additionally, there is a consensus amongst the respondents that the board of directors is responsible for the company’s governance risk and compliance programs and that the respondents, as internal auditors, are responsible for verifying that these programs work as intended. In practice these tasks are explained in the following way:

“We examine whether the policies are in place, segregation of duties are in place, that the business is handled as intended i.e. that our assets are not misused, that our processes are working”
(Company 3)

On the other hand, the IAF is also a business-partner as it assists the development of an understanding of where breaches may exist; thus, the assurance, as well as the consultancy services, are present which confirms Van Peursem’s (2004) view that the internal audit conducts a combination of the two activities. The business perspective is especially evident in that the investigated companies had a line to the CFO on the organisational chart, where management also could be updated on ongoing concerns. However, it is clear based on the interviews that the mindset of the respondents varies in terms of the IAF’s level of independence towards the rest of the company. Some of the IAFs work closer to the second line than others, which is evident in the following quotation:

“We have a lot of analysts within the organisation […], so we would many times go to these people and just ask them for the information and then ask them to help us out with the analysis”
(Company 4)
According to the respondents, the IAFs are in a constant process of change, which is analogous to what is described in the literature (e.g. Bou Raad, 2000; Eulerich et al., 2013). The internal audit is experiencing a change from manual tasks to automated procedures – a change that is only likely to proceed in the future.

“[…] we are moving into a more technology driven audit function” (Company 2)

Nonetheless, there are divergences amongst the respondents on how evident this change has been. For example, just because all respondents leverage technology now more than before does not mean that everyone does it equally much, as depicted below:

“Not much that has changed. The major thing that has happened is the introduction of an audit program that works as a planning tool.” (Company 10)

In contrast to:

“It has gone from manual work, where people were literally picking of schedules to a much more automated auditing.” (Company 1)

The respondents equally believe that the technology adoption within the IAF does not per se change the role of the internal auditor. The primary mission is still the same – it is to ensure compliance and add value to the organisation (IIA, 2016).

“CA does not change the intended role of the IAF, what it can do is that it can free up time and resources to add even more value” (Company 2)

However, technology will enable achieving the objectives of IIA to a greater extent than traditional audit methods in that IAFs can leverage technology and delve deeper in their analysis – confirming previous literature (e.g. Bou Raad, 2000; Eulerich et al., 2013; Gonzalez, 2012a). Still, company 1 argues that the need for the depth of the internal audit has partly contracted with the rise of the second line of defense.

“Perhaps it has actually contracted with the rise of the second line.” (Company 1)

ImPLYING that it is easier verifying the second line of defense than, as before, being the only function verifying the controls. At the same time the scope is becoming broader “[…] we audit strategy and culture which are things that were not audited before” (Company 1). This is also in line with company 2 who argues that the scope of the internal audit is becoming both broader and more in depth, and the reason that companies starting to consider CA are
simply to “[...] cover more ground [...] going deeper”. Evidently, this development is also in line with that depicted by Gramling et al. (2004). The companies in the financial and insurance sector (Company 1, 4 and 10) are operating in sectors that are very highly regulated. This also holds true for Company 7 which is helping financial companies with them constituting the IAF. These regulations consume a lot of resources and sometimes hinders the IAFs from doing additional audits with a broader focus.

“New regulations are constantly implemented which inevitably leads to some development. Almost all of the audit plans are consumed by regulatory reviews.” (Company 7)

Even though a considerable amount of time is attributable to the regulatory audits in these companies, there are still pressure from the board of directors to cover more ground – confirming that the IAF is a valuable resource for the company (e.g. Bou Raad, 2000; Eulerich et al., 2013) due to the diversity of tasks conducted (e.g. Gramling et al., 2004).

“The board is increasingly interested in the internal audit as they now have more personal liability if the bank fails.” (Company 1)

In addition, due to above companies’ size, complexity and regulatory requirements (Company 1, 4 and 10) the functions within the different defense lines are very distinct i.e. there are clear delimitations between the first, second and third line of defense. Ultimately, this seems to lead to that the IAFs of these companies have a more pronounced role that is also understood by the rest of the company.

“The IAF holds a very strong position within the bank, which makes a great advantage when conducting audits.” (Company 10)

Confirming what was argued in the literature section, that the TLoD model is widely accepted. Yet, some companies e.g. the financial ones have a more distinct and prominent division than others.

“Now we are verifying the setup of management control structure with the second line and the first line is functioning appropriately.” (Company 1)

As depicted in the foregoing quotation, and others above, the IAF has an established place within the companies – acknowledging Gramling et al. 2004. Even though if the management were to fulfil their mission in creating proper GRC, only the first line would be needed.
“My goal is to make myself useless in a sense, that they do not need me anymore. [...] you have to have that as an aim” (Company 4)

However, there are always going to be controls and processes that are failing as well as risks and opportunities that are not properly balanced – confirming IIA (2013) stance on the importance of each defense line. Inevitably, the IAFs conduct a diversity of tasks, hence, being an internal auditor goes beyond mere box-ticking-exercises:

“[...], but that is sort of aiming for the stars, we will never get there because change is too rapid in an organisation risks are still there, new risks are coming.” (Company 4)

Nonetheless, as the scope of the internal audit agenda consumes resources, they need to be allocated wisely. A solution to this is, of course, leveraging technology and automated auditing such as CA. However, it is evident that the inherent ambiguity of CA described in section 2 also is evident amongst the respondents. Some respondents look upon CA as something that primarily belongs to management, as opposed to the literature where such actions rather should be described as CM (e.g. Coderre, 2005).

“The daily continuous auditing is more something for management to do themselves than for internal audit to do.” (Company 1)

However, this stance is mainly attributable to banks which have an extensive second line of defense. In contrast, some respondents manage to view the terms (CA and CM) separately and distinguish between the two. As pointed out by Company 2 “CM is often mistaken for CA”, and that CA is clearly a responsibility of the IAF as it can be used for guiding the risk assessments. Meaning that defining a set of controls and continuously review them can reveal violations/exceptions that certain processes are no longer sustained, whereby, an internal audit could be directed towards that particular area. Hence, CA would serve as a “great input to your risk assessment and process, and as a consequence into your planning process” (Company 2). This does not only confirm that an internal audit takes a risk-based approach (e.g. Ismail, 2010; Pickett, 2011), but also that CA could benefit the procedure of providing assurance to the business as depicted by Teeter (2014).

**Motivation Perspective**

It is clear that all of the respondents do not look upon CA in the same way, and the majority is still leveraging just a fraction of the technology that could eventually enable CA. This, in
turn, confirms previous studies that indicate a low CA adoption rate (e.g. Alles et al., 2006, 2008; Gonzalez et al., 2012b; Vasarhelyi et al., 2012). There are two standpoints visible amongst the respondents in regards to their stance towards CA. Firstly, there are the respondents (Company 1, 4, 5, 7, 8, 10) who think that leveraging CA will put them in a position where they are doing the work of the second line i.e. the same perception as the Swedish branch of IIA (Forssblad, 2009). Hence, implying that there is not the responsibility of the internal audit but rather that of the second line, as present in the following quotation:

“Instead of doing it ourselves we will tell others to do it.” (Company 4)

Secondly, there are the respondents (Company 2, 3, 6, 9) who think that leveraging CA without interfering with the second line’s work is possible and should be aimed for. Implying that the IAF should embrace automation, or as one respondent put it:

“They [meaning the second line] have all the data – why not use it? (Company 6)

Hence, there is one group of respondents who do not fully believe that attaining real-time or close to real-time assurance on a subject matter falls within the scope of the IAF. Nevertheless, the technology that bestows the possibility of assessing matters more in depth and more often is welcomed by all respondents even though all do not share the audit-by-exception mindset of CA. Indeed, it is also evident the respondent’s definition of what CA is for them can vary between that of other respondents. However, in regards to above-mentioned standpoints, the respondents are answering with the notion that CA is seen as an ongoing audit i.e. following the definition of this study. Even though the level to which an IAF should apply automated audit procedures is not commonly shared between the respondents, they still express similar motivations on why technology is or will be, further leveraged. One such common explanation is present in the following quotation:

“Data is becoming available as banks are using [data] warehouses which makes it easier to access the data. Enabling an exploration of customer trends for business purposes, and the IA can leverage the same data for internal auditing.” (Company 1)

Thus, technology as such is expended in an attempt to become an, even more, value-adding function. Interestingly, the respondents (Company 2, 3, 6, 9) who attempt to go a bit further in their audit automation process, i.e. enabling CA in its true sense, is not doing it due to regulatory requirements or any other specific area, rather, it is strived for “just because it is sensible” (Company 2). Implying that today’s complexity of a large organisation simply
demands to leverage technology to pass assurance on not just a tiny proportion of the infrastructure – confirming previous literature that present CA’s demand as a consequence of increased complexity (e.g. Greenstein and Ray, 2002; Vasarhelyi et al., 2004). If an IAF could use CA, it is argued that the efficiency, as well as the effectiveness, would improve.

“Efficiency, internal auditing needs to follow and be updated in the time we are. […] Internal audit should be in the forefront.” (Company 3)

Along with increased efficiency and effectiveness comes a reduction in audit times which leads to that more of the time could be used for expanding the scope, which is in line with previous literature (e.g. Alles et al., 2008). A second aspect that is evident as a motivational factor of CA is that it can be used to verify that audit findings are taken care of.

“CA can be a means of verifying that the number of deviation or policy violations are decreasing.” (Company 2)

Noticeably, there is no direct evidence of what is proposed by Rezaee et al. (2012) and Elliot (2002) that CA origins from a wish for more frequent financial reporting. Neither was the compliance related factors as apparent as proposed in previous literature (e.g. Brown et al., 2007; Harrison, 2005). Rather, CA builds on a desire of establishing sufficient quality of audits and making a more thorough audit assessment. More apparent resemblances are found with the economic perspective described in previous literature (e.g. Alles et al., 2008; Rikhardsson and Dull, 2016; Vasarhelyi et al., 2012; Davidson et al., 2013). As increased efficiency and effectiveness leads to improved productivity and quality. Such efficiency gains will also in turn limit exposure and losses and ultimately save money similar to what is described by Teeter (2014). One of the main benefits with CA is the transition from audit samples to audit whole populations, as present in the following quotation:

“CA gives us the opportunity to have a much more efficient audit coverage of the full population of data.” (Company 6)

Why all of the respondents, although in various degrees, work more digitally now than a few years ago could be summarised into three core reasons. Firstly, the audit committee and the board of directors have more responsibilities in the sense of legislation and/or have realised the true benefits that technology could give.

“They want us to make sure everything that needs to be reported comes up to be reported.” (Company 3)
Secondly, operational management is control and risk compliance driven and hence provide good support.

“The operation also wants automatic solutions, they, similar to us, would like to get rid of as much manual work as possible.” (Company 9)

Thirdly, the business itself now realise the value-add coming from the internal audit.

“They increasingly ask us, what is in it for me? Show us what you can do, show us what is interesting.” (Company 6)

Confirming previous literature that support and interest, especially from senior management, is key to enhance the adoption of CA (Alles et al., 2006, 2008; Gonzalez et al., 2012a, 2012b; Vasarhelyi et al., 2012).

**Application Perspective**

All of the respondents had knowledge of the concept of CA as well as of possible applications in the organisation and within the IAF. Evidently, this could be considered as good news as knowledge of possible applications serves as an important insight into how to successfully leveraging CA (Brown et al., 2007). Some of the respondents were in the process of setting up such audit automation tools whilst others were focusing on refining existing working methods further. What all the respondents have in common, despite differences in implementation complexity, is that when implementing a new working method or programme they all started off on a small scale – in line with the literature (e.g. Boccasam and Kapoor, 2003; Potla, 2003). For example, one of the respondents whose IAF is at the beginning of an implementation process describes it in the following way:

“it takes time to get it adopted by an entire organisation, so you have to see this implementation as a roadmap, you start within a couple of entities and assess whether there is a value of CA […] then you take it to the next level” (Company 2)

Nonetheless, from a strict application standpoint, none of the respondents has a functioning CA system in place, meaning, that an ongoing audit is not present. There are a few that have this as a pronounced goal (Company 2, 3, 6) whereas the rest of the respondents focus on different data analysis tools and does not intend to have an ongoing audit approach. All of the respondents work with data analysis in various degrees; this means that they use data extraction and analysis programmes (e.g. ACL™, CaseWare IDEA®, Tableau® and TIBCO
Spotfire®) which enable the user to process large amounts of data finding both patterns and irregularities. These programmes are also preferred over other spreadsheets programmes, such as Microsoft Excel™, as the user cannot modify the downloaded data which enables the creation of an audit trail. Yet, these types of programmes are only used when the IAF has already decided to audit the specific underlying data i.e. nothing is done on an ongoing basis since the auditor must initiate the analysis. Thus, in the applications framework of CA presented by Bumgarner and Vasarhelyi (2015), none of the IAFs could be regarded as having established CA. Still, there is a willingness amongst a few (Company 2, 3, 6, 9) to advance in the framework by taking initial steps towards a continuous data audit (CDA) and continuous control monitoring (CCM). Data analysis programmes are quite cheap to acquire, however, attaining the competence in running them properly tend to lead to additional costs. Thus, the findings are somewhat consistent with previous research (e.g. Brown et al., 2007; Warren et al., 2015) arguing that the cost of running the programmes are relatively cheap. Furthermore, some of the respondents argue that they are easy to handle:

“Very easy to learn, it is cheap; frankly it is much bang for the buck.” (Company 8)

Whereas, some argue that it is more difficult:

“This is not just something that you do on a Friday afternoon.” (Company 6)

However, it is likely that the influence by data analysis vendors has led to better knowledge of the programmes amongst internal auditors, as depicted in the following quotation:

“All of the big analytics companies bombarding you with their marketing material.” (Company 2)

Still, for the IAFs to continue leverage technical tools additional demands are identified in regards to the internal auditor’s skillset. The main skills identified by the respondents are knowledge within IT and analytical ability.

“The technical bits become more and more important […] when analysing the data more and more, you will need much more analytical knowledge.” (Company 5)

Additionally, it is argued that the skills and knowledge in visualising and communicating the result are equally important.

“Data analysts, someone with less audit and more detail knowledge of particular areas. So the perfect fit is the data analyst and a journalist combined.” (Company 6)
But perhaps the most important qualification is, as in any change, the ability to be innovative and open-minded.

“to have an innovative mindset is very important, and will continue to be.” (Company 8)

Furthermore, when the respondents describe their implementation of data analysis, it shares significant similarities with the implementation process of CA, described by Chan and Vasarhelyi (2011). Firstly, the respondents have started off with an analysis that they knew would also be fairly popular in the second line in order to gain as much support as possible. This could be looking for duplicate payments i.e. searching for payments that have been done twice and expensed twice. Clearly, that is money that could go right back into the till for further projects if one is successful. The script made from this could then be incorporated in the second line whereby the exceptions that might occur gets treated immediately. What began as an ad-hoc analysis has then been translated into a formalised procedure which the internal auditors also can monitor. However, some argue that the ongoing monitoring part is not to be used by the IAF (Company 1, 4, 5, 7, 8).

It is also clear that the success in leveraging above mentioned analysis programmes differs amongst the respondents. Some have a more pending attitude (e.g. Company 5 and 10) due to that previous attempts not having met sufficient results (e.g. Company 5) or that dedicated data analysis staff is scare within the audit team (Company 10). On the other hand, we have those who have not been hindered by adversities and kept on trying and finally achieved desired results. Hence, attitude and perseverance seem to be key:

“The first 10 instances of an analysis are completely useless because they are just incorrect, and I think that is one of the main reasons why this journey has taken so long – it is not easy, and it is never out of the box.” (Company 6)

In line with Rezaee et al. (2002) who highlights the importance of appropriate IT infrastructure, everything of the above is easier when having a unified system infrastructure which simplifies the data gathering process as well as the implementation of audit programmes. As present in the following quotation:

“It is a barrier in the sense of the availability of data […]. It is an obstacle to having a really widespread architecture, infrastructure and software portfolio.” (Company 3)

However, it is not seen as a requirement:
“It is not a prerequisite in making CA a success, but it does make the life of the person responsible for implementing CA a lot easier.” (Company 2)

This implies that the PEU is likely to be lower with a diverse IT infrastructure, and for that reason might not be adopted.

**Impact Perspective**

CA is not aimed for by all respondents, due to reasons discussed above, however, that does not imply that the ones that chose not to leverage CA do not have a view on what impact it would have. Moreover, those of the respondents that do aim for CA has not yet seen its impacts fully due to them being at the beginning of the process. In line with Lombardi et al., (2014) the respondents are of the opinion that automated auditing will not be able to replace human judgment. CA, as well as data analysis, could work as intended and not display exceptions or deviations that might impose a risk to the company. This could be due to reasons such as fraud when a number of employees cooperate in order to bypass the controls making the data look fine. Therefore, it is important not to have an overconfidence in technology.

“In any system, there will be individuals that will try to override it. It might be objective but the once working with them needs to have a full understanding.” (Company 4)

Another impact that the majority of the respondents shared with the increased use of technology, such as data analysis, was that the productivity in relation to cost had gone up, which is also in line with Rikhardsson and Dull (2016). In turn, this leads to that the feedback from internal audit to the first and second line has become faster.

“You are able to intercept deviations […] so that you can focus directly on them. Which is a real improvement for the entire business.” (Company 9)

Another key factor when leveraging data analysis and more advanced technology is that the audit approach is likely to slightly change. As seen in a previous quotation by Company 2, it is argued that such technologies enable going deeper; ultimately, more time is given for detective work as opposed to the general state of being reactive.

“It is much easier for us now to have reports in the end meeting when we actually can say you are losing this much money because you are doing this wrong, and why you are doing this wrong, is due to this guy/function.” (Company 3)
The possibility of giving such detailed information obviously facilitates for management making the right decisions. Accordingly, the shift towards a more detective approach is also in line with previous literature (e.g. Alles et al., 2006; Rikhardsson and Dull, 2016), not to mention the increased quality in the decision-making of management (e.g. Vasarhelyi et al., 2012; Rikhardsson and Dull, 2016).

The relation and approach to external parties have actually, despite comparatively small changes to working methods, been affected for some respondents – especially towards the external auditors. However, some respondents argue that data analysis and more sophisticated technology in the IAF also affect investors, which is in line with (Brown et al., 2007; Miller, 2002).

“Investors willing to pay a premium for good GRC and potentially avoid companies with bad GRC.” (Company 3)

The external auditors have shown their interest in that they would like to take part of the analysis conducted.

“They want copies of all analysis and shows a lot of interest.” (Company 8)

However, their interest is also present when it comes to limit their exposure.

“The more we build up according to best practice makes the external auditors happier as they could limit their risk exposure.” (Company 9)

In turn, this of course also have an effect on the external audit fees.

“Decrease of audit fees depending on how well GRC is managed.” (Company 8)

**Technology Acceptance Model**

The respondents, through the lens of the TAM model, could be divided into two groups. For the respondents that intend to use CA (Company 2, 3, 6, 9) there is a shared conception that CA would provide benefits in their daily tasks i.e. a high level of PU. Interestingly, the PU is also recognised by the other respondents (Company 1, 4, 5, 7, 8, 10), but, with an important distinction that CA is not related to their responsibility as a function, which in turn affect the intentions for them to use CA.
A common picture is presented when assessing the external factors (i.e. application, impact), all of the respondents have a knowledge of CA that crystallises in an awareness of how it potentially can be applied and what impacts it might impose. Moreover, even though the PEU varies slightly amongst the respondents, the general stance is that CA is attainable, nonetheless, if the IAF does not receive pressure from their stakeholders they might be likely to keep on working with traditional audit methods – as that does not require any effort to change. While in regards to the respondents that intend to use CA there seem to be adequate incentives to pursue it.

Accordingly, the intentions to use CA is not solely influenced by knowledge of possible applications and impacts of an adoption, but also by the perceived restrictions in the IAF’s responsibility.

**Summary of Main Findings and Analysis**

**Finding 1:** More than half of the respondents (Company 1, 4, 5, 7, 8, 10) does not believe that CA lies in internal audit’s area of responsibility.

One of the main findings that directly affect the research question is the ambiguity surrounding the concept of CA. Accordingly, this affects the intentions to use CA for the respective IAF negatively. Thus, these respondents are not planning to execute any ongoing assurance of any kind. In contrast, the remaining respondents (Company 2, 3, 6, 9) do believe that leverage technology in a way that could provide such ongoing audit possibilities should be embraced. Evidently, all of the respondents does not unite in their view on CA which clearly would serve as an explanation to why CA has not been applied more than expected. Interestingly, there seems to be an increased willingness amongst the respondents that have a positive attitude towards CA to cooperate more closely with first, and second line of defense. In other words, these respondents look upon the technology advancements more in line with what is described in the literature section i.e. that there is an inverse relationship between CA and CM. The respondents that were not planning to leverage CA lacked such a view as they were committed to the standpoint that independence issues would arise with such solutions. Implying that if CA were to be applied the third line would collapse into the second line. The proponents of CA highlighted the value add of continuing to automate their work, despite the fact that they concurred with them being closer to the second line.
Thus, interesting insights to the “why”-question has aroused as some IAFs seems to dodge an application of CA not because of practical issues in the adoption process, but rather as an effect of that the concept itself lies to close to the responsibility of the second and first line of defense.

**Finding II:** Only examining PU and PEU does not provide an exhaustive view on the intentions to use CA.

The findings show that PU and PEU are blunt tools when it comes to determining the intentions to use CA. For example, the respondents’ answers in relation to PU are mainly positive, and the same holds true for PEU. Nonetheless, more than half of the respondents have no intention to use CA. Through the lens of these respondents; CA could be regarded as both easy to use and beneficial for the function, yet, these respondents do not see CA as their responsibility. Hence, it is evident that applying the TAM model in a mechanical fashion would purport dubious results. This highlights the importance of qualitative research with semi-structured interviews within the certain field as it facilitates capturing such deviations – confirming (Clegg et al., 1997; Jepperson and Meyer, 2011) that different methodological approaches should be employed when studying a phenomenon.

It is apparent, based on the findings in this study, that previous research that have taken a survey approach using the TAM model have provided a simplified explanation when establishing factors that influence an adoption of CA (e.g. Gonzalez et al., 2012a, 2012b). Since even though PEU is argued (Gonzalez et al., 2012a, 2012b) to be of importance in the decision of implementing CA this study provides additional evidence that goes beyond the restrictions of the model in that high PU together with high PEU does not necessarily lead to intentions to use CA.

Consequently, the TAM model offers a good, yet general, explanation to what factors that are important when accepting new technology. Still each individual case should be further elaborated, and in this case the TLoD model helps to bring additional understandings to internal auditors’ intentions to use CA.
Conclusion

The adoption of continuous auditing (CA) by internal audit functions (IAFs) has for a long time been regarded as necessary both by academia, business society and standard-setting groups. However, despite the fact that CA was first introduced in the 1990s, the actual adoption amongst IAFs are yet limited. Visibly, the lagging progressions of CA are confusing, whereby this study seeks answers to why the adoption is so modest. Using semi-structured interviews with internal auditors at large Nordic companies the study set out to capture the factors leading to an intention to use CA or not.

Technological progressions are made in the IAFs – some more distinct than others. Yet, the way of working is still centred around a traditional audit approach where audits are limited to be a periodic activity on a monthly, quarterly, or yearly basis. Thus, a shift towards a continuous audit paradigm is not yet evident. CA defined as an ongoing audit or audit-by-exception, have not been leveraged by any of the respondents. The attitude towards such an adoption varies amongst the respondents where more than half of the same argue that it is something that falls outside of their responsibility as a function. Thus, for the opponents, CA is not attempted to be achieved for reasons attributable to concerns around – data and information, technical skills and knowledge, and senior management support (e.g. Alles et al., 2006, 2008; Vasarhelyi et al., 2012) – but rather due to independence issues resulting from that the third line is coming closer to the second line. As a result, these respondents does not express any intentions to use CA. However, in regards to the proponents of CA, such practical factors were evident, and these respondents did not see an issue in leveraging automated auditing despite moving closer to the second line. Correspondingly, why the adoption of CA is lagging is, according to this study, due to that a significant part of the internal auditors are of the opinion that CA is the responsibility of first, and/or second line of defense i.e. outside their concern as a function. Similarly, from a theoretical viewpoint, this study shows that the TAM model is insufficient in determining the intentions to use CA. This is evident as some respondents recognise the perceived usefulness (PU) as well as the perceived ease of use (PEU) of CA, but still, chooses to reject it for responsibility reasons. Thus, the TAM model can be further developed to incorporate additional factors.

Despite the contradictions about how far the IAF should go in regards to technological adoptions; it is clear that all of the IAFs leverage data analysis tools (although in various
degrees) enabling a deeper review on whole populations rather than on small samples. The study points out that the ongoing digitalisation and automation will increase the quality of the audit through the audit being conducted more efficiently, comprehensively and with a higher reliability. The combination of data analysis and traditional audit methods gives the internal audit a sound basis for their assessments and creates the conditions for better communication and advice to both the board of directors and management. Consequently, the relevance of the IAF is regarded to be sustained without CA – at least from the opponents’ point of view. When a major part of the work is performed by means of data analysis that takes place on a regular basis throughout the year, it gives the internal auditor the opportunity to work more proactively and going deeper into specific areas of interest.

There are several ways to increase the efficiency and effectiveness in the IAF, one of which is CA. Thus, based on the findings in this study it is evident that if CA should be realised by IAFs, some of the internal auditors’ perceptions of CA has to be altered. This could be done through an increased cooperation amongst academia, standard-setting groups, and internal auditors in setting a common way forward.

Consequently, this study provides interesting insights into the perception and attitude amongst internal auditors towards the adoption of CA, and also offer a plausible suggestion for why CA has not been leveraged further. Therefore, the study has, despite its limitations, provided findings that go beyond prior empirical research in that it delineates potential hurdles in the adoption of CA that is not solely owed to practical issues, but rather to more overarching concerns around responsibility.

**Future research**

Future research may expand this study by exploring how the IAF’s stakeholders view the technology trend and what they perceive as necessary features of the IAF going forward. In addition, similar to previous research (e.g. Curtis et al., 2009; Hardy, 2014; Vasarhelyi et al., 2012;), this study confirms that internal audit due to the technological developments will be less time-consuming, in the sense that more mundane parts of the audit can be automated. This entails changes where a knowledge gap can occur when internal auditors, who are in their early years of their career, need more qualified knowledge. Therefore, further research ought to investigate how this situation is going to be addressed.
References


Appendices

Interview guide

Introductory questions
1. What is your main role within the internal audit function?
2. For how long have you been in your current position?
3. Could you tell me about how internal audit is organised in your organisation?
4. You have worked in the internal audit function in X number of years. Do you feel that the tasks have changed over the years? If so, in what way? Why do you think they changed?
5. Has the scope of the internal audit function expanded in recent years? If so how, and how is it dealt with?

Questions relating each perspective

Motivation
1. How is IT used in the internal audit function?
2. Do you apply automated auditing i.e. CA? If not, why?
3. Could you describe a typical application? Do all automated auditing/monitoring procedures have such characteristics, or is there additional alternatives?
4. Why did you implement CA (or why not)?
   a. Resources
   b. Risk management
   c. Regulatory requirements
   d. Increased focus on compliance
   e. Other

5. How do you believe CA affects the role of the internal audit function?

Application
1. Who is (would be) the main user of the solution?
2. Focus directed towards controls or transaction monitoring (or both)?
3. How do you perceive the quality of the data obtained from the ERP systems, is the data ready to be used by CA tools?
4. How should existing audit/control procedures be modified to increase the utilisation of technology in monitoring/auditing?
5. Identify the resources required by the organisation to utilise CA/CM and the demands imposed on IT resources.
6. What risks or potential drawbacks do you see with CA?

Impact
1. What impact has (would) the application of the CA had (have) on the organisation?
   a. Processes
   b. Economic
   c. Compliance
   d. Other

2. How is (would) the relations and approach to external parties (be) affected?
   a. External auditors
   b. Investors
   c. Lenders

Future oriented questions
1. What are the barriers to more widespread use of CA?
2. How do you think the future of internal audit will look like? Will work differ much from today?
3. The internal audit is currently a relatively resource-intensive process; do you think this will change in future (if so, how)?
4. Do you think that there will be a continuous, as in ongoing, audit of controls and process or just more frequent than today?
5. What skills will be required of a future internal auditor?