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Rethinking The Future of Auditing:
How an Integrated Continuous Auditing Approach Can Leverage
the Full Potential of Continuous Auditing

Dr. Sebastian Weins, Dr. Bastian Alm, Prof. Tawei Wang

Abstract

The concept of Continuous Auditing has been around for more than three decades. The ongoing discussion on the benefits and models on adoption has made Continuous Auditing become a more critical issue. Although a lot of progress has been made in previous years, we argue that the entire potential of Continuous Auditing still remains unrevealed.

This paper provides a new conceptual framework on how to bring Continuous Auditing to the next level. It goes beyond the existing technical concepts and solutions for implementation by developing a more holistic Integrated Continuous Auditing Approach. We illustrate how Continuous Auditing can be adopted in order to increase audit efficiency by enabling a new collaborative design between internal and external auditors as well as by readjusting the roles of different auditing parties.

Keywords: continuous auditing, internal audit, audit collaboration

1. INTRODUCTION

The early stages of continuous auditing (CA) can be dated back to the beginning of electronic data processing during the 1970s (Vasarhelyi 2002) when the focus was on computer-assisted testing of internal controls (e.g., Cash et al. 1977; Varsahelyi and Halper 1991). The subsequently development in the network-structure and Enterprise Resource Planning (ERP) systems encouraged more research on CA (Dal-Ri Murcia et al. 2008). From a theoretical and practical point of view, research over the last decades has shown how CA can be achieved. For example, Kuhn and Sutton (2010) compare different IT-architectures for implementation of CA and assess to what degree those concepts can be applied for ERP systems. Various surveys show that a majority of respondents are planning to adopt or already have adopted CA approaches in some area of their business operations (PwC 2006; Baker 2009). Recent empirical studies also reported that practitioners have recognized the value and benefits of CA and frequently state the need for transforming audit methodology (PwC 2014; KPMG 2012.).

Nevertheless, these results mask the fact that many companies are still in the initiation phase of implementing CA (Vasarhelyi et al. 2012) not to mention the understanding of how to effectively implement and leverage CA remains limited (PwC 2014; Hardy 2014; KPMG 2012). PwC (2014) finds that even among the most proactive and strategic oriented internal audit departments, only 51 percent effectively use audit technologies in the execution of audit activity including data analytics, while among companies with traditional internal audit function, the use was as low as 29 percent. The results from KPMG (2010) confirm that there is a big gap between audit departments who want to implement CA – only 23 percent do not take into consideration to implement CA – and those seven percent who already have partly implemented some forms of CA. Furthermore, recent studies like a case study of implementation (Singh et al. 2014) or a long-term comparative case study on the adoption

and implementation of CA (Hardy 2014) provide empirical evidence that there is no standard approach existing on how to adopt CA.

Although research has provided an understanding of the advantages of CA, these results show that the effective use of data analytics or moreover of CA are still far away from becoming best practice. Even with the literature and the guidance provided by the Institute of Internal Auditors (e.g., IIA 2005 and IIA2015a), still many questions in the context of implementing CA for internal auditors still remain unanswered, such as the design and required tools, which affect the efficiency of the audit, the collaboration among auditing parties, and the role of internal and external audit. The prevailing limited understanding and the early stage of adoption strongly indicate the need to further develop the vision of the future of auditing in a CA environment that addresses these questions. Based on our discussion, this paper attempts to propose an Integrated Continuous Auditing Approach (ICAA) that can meet the audit challenges and show the corresponding changes in auditing tools, the audit process and the roles of auditing parties.

The paper is organized as follows. In Section 2, we discuss the challenges in more details. We present the proposed approach in Section 3, and conclude in Section 4.

2. CURRENT AUDIT CHALLENGES

Auditors are currently facing critical challenges. These challenges – be they internal or external to the audited company – are immense and manifold (e.g., KPMG 2015, 2015; IIA 2015b) and will all have to be addressed in order to propose an Integrated Continuous Auditing Approach (ICAA).

- **Challenge 1: Improve Audit Efficiency**

The prevailing need for cost-cutting activities, an increased risk exposure, a rapidly changing regulatory landscape and growing stakeholder demands are drivers towards further increasing audit efficiency. Additionally, the increasingly relying on information technology of business operations – such as online systems or ERP systems as well as the availability of comprehensive electronical data – has enabled real-time data-processing. In this real-time environment, where information can be provided instantaneously after certain events have occurred, mastering the audit methodology shift towards CA can add value by providing ongoing assurance regarding controls and risks as well as creating the opportunity for prompt corrective actions. The automation of audit procedures can also promote a more efficient use of organizational resources to test populations instead of samples (Nelson and Ambrosini 2007; Searcy and Woodroof 2003). An ongoing assessment of risks enables the company to continuously allocate resources in the most efficient way.

- **Challenge 2: Increase Collaboration between Internal and External Auditing Parties**

The increase of different forms of collaboration within an organisation or between organisations is well known as a value driver. The advantages also translate to the collaboration between different auditing parties – like financial statement auditors or regulatory auditors. Intensifying collaboration between audit parties can as well leverage super-additive value synergies (Davis and Thomas 1993) to improve audit quality as well as sub-additive cost synergies (Teece 1982) to reduce audit costs.

A better exchange of expertise and knowledge could substantially improve audit quality. Internal auditors, who are due to their ongoing audit activity acquainted with internal processes, structures and controls, can bring in organizational-specific expert

knowledge external auditors cannot maintain. This can help minimizing the likelihood that different risks are not sufficiently covered or erroneously not covered at all.

Although these benefits of collaboration are well known and audit standards (e.g., PCAOB Auditing Standard No. 5, PCAOB 2007) encourage external auditors to make greater use of work already completed by internal auditors, a collaboration that goes beyond the manual exchange of information – such as the exchange of audit reports, documentation or conducting interviews – can hardly be observed in practice. Although the concept of joint audits is discussed, the application is still very limited due to potential conflicts of interest and transaction costs (Ratzinger-Sakel et al. 2012).

▪ **Challenge 3: Strengthen the Role of Internal Auditors within Corporate Governance**

Various scandals in the early 2000s and the banking crisis in recent years have demonstrated audit failure on a regular basis in ensuring a reasonable risk taking and a sustainable risk strategy. Various other scandals, like the Volkswagen emission scandal in autumn 2015, have also shown significant shortcomings in corporate governance structures as well as the need for a stronger and more independent audit function.

Audit research has – in general – focused on finding answers to each single challenge, while neglecting the widely ramified interdependencies existing between the challenges. In particular, previous research on CA omitted the links among these prevailing major current audit challenges to CA and stopped at explaining how CA can improve audit efficiency (challenge 1). Hence, the scope of CA literature often remains limited to describing the benefits of the method itself and possible ways of implementation, instead of providing a full picture of what can be achieved with CA in the context of all existing challenges.

3. PROPOSING AN INTEGRATED CONTINUOUS AUDITING APPROACH

Developing a holistic Integrated Continuous Auditing Approach (ICAA), that has the potential to provide answers to all of the above listed subordinated audit challenges, has to yield the so far – if at all – only partly researched synergies between audit methodology and audit challenges, such as:

- **CA and collaboration:** The reliance of external auditors on internal auditor's activities remains an issue to be researched (Wang and Cuthbertson, 2015). Malaescu and Sutton (2015) have shown that CA can improve the reliance of external auditors on the work of internal auditors. Another recent study by Anderson et al. (2012) has provided evidence, that investments in IT audit techniques and technology, which both are essential to implement a CA environment, is one of the environmental factors affecting internal audit reliance. Existing research has so far left unconsidered that the potential of CA can even go beyond increasing reliance. CA can enable a completely new collaboration design with a common risk and reporting language, common interfaces, common access to audit relevant information and automatic exchange of information.

- **CA and transparency:** Transparency throughout the auditing process can be considered as a door opener to a closer collaboration and for strengthening the role of internal audit in corporate governance. Still the research on how to increase transparency among different auditing parties is very limited. Alles et al. (2004) have discussed the implementation of a "black box log file" enabling a third party to monitor the "audit trail of an audit" to combat fraud based on collaboration between auditors and management. This concept could be appropriate to increase reliance among auditing parties. The concept itself has not yet been thought in the context of CA.

- **CA and the role of audit:** Strengthening the role of auditors in corporate governance structure will require an up-to-date audit methodology that enables auditors to assess risks on a continuous basis. Weins (2012) has proposed a CA based concept to strengthen the role of internal audit in corporate governance systems of banks, in which a wrong risk strategy by top-management contributed to the crisis of a whole industry. CA not only bears the potential to test controls on a continuous basis, but also to assess the business inherent risks on a continuous basis. This enables auditors to challenge the risk strategy of management board and identify risks that endanger the continuation of a company.

The ICAA will be introduced along (i) the tools auditors will need to have access to enable CA, (ii) the new design of collaboration of auditing parties along the auditing process in a CA environment and (iii) the readapted roles of auditors. In order to leverage the full potential of the collaboration and the shift in audit methodology this section will offer solutions to the following questions, which so far remain unanswered in research:

- **Design and required tools:** From a conceptual point of view, how could a best-practice CA environment be designed in order to increase audit efficiency? Which tools will auditors use in order to leverage the full potential of the method?
- **Collaboration among auditing parties:** What impact will CA have on the collaboration between internal and external auditors (especially financial statement auditors)? Can CA affect the reliance of external auditors on the work of internal auditors? If yes, what setting will be required to leverage the potential for collaboration?
- **Role of internal and external audit:** What role shift will be necessary for internal and external auditors to optimize the value for stakeholder in a CA environment? How will the role of internal and external auditors look like in a CA environment?

3.1. Auditing Tools: Implementing A Continuous Auditing Platform

For the purpose of an ICAA we assume the existence of a central data warehouse, to which relevant data can be transferred in real-time e.g., via XBRL. Relevant data has in common, that it enables insights into performance, level of risk or efficiency of controls. Included can be financial, operational and other forms of electronic data internal or external to the organization. Due to the often fragmented IT-landscape with complex interfaces the implementation of a central data warehouse still appears an ambitious project, but still today 69 percent of internal audit functions already have their own data warehouse for accessing data (Protiviti 2015). Further, the development in many organizations towards an integrated data architecture and data warehouse is driven by reducing manual reconciliation processes and avoiding redundant data bases to ensure data consistency.

The data in the warehouse can be used to perform the two elements comprising CA:

(1) An Ongoing Control Assessment that describes the continuous evaluation of internal

controls against a baseline condition and subsequent changes to control configurations as well

(2) An Ongoing Risk Assessment, that can be defined as the ongoing identification and assessment of risks to the achievement of business objectives (IIA 2015a). By using technology-based audit techniques auditors – continuously or real-time triggered by an underlying event – run routines based on defined audit algorithms as part of the Ongoing Control Testing as well as monitor risk indicators based on predefined thresholds as part of the Ongoing Risk Assessment. In addition to real-time analysis, the data warehouse enables auditors to conduct over-time comparison and statistical analysis like the predictive extrapolation of trends, simultaneous equation models, vector autoregressive models, regression analysis and neural networks or even micro-econometric methods like described in Alm (2013).

All auditing parties will be given access to a user interface (“CA cockpit”) consisting of the following three generically described modules:

- a. With a real-time **“Alert Log”** auditors will have access to a tool that immediately displays control weaknesses identified by the routines as part of the Ongoing Control Testing. Also the exceeding of pre-defined thresholds for risk values of audit item as part of the Ongoing Risk Assessment trigger an instant alert. The alert will only be displayed to those auditing parties – be they internal or external – who have subscribed to the underlying routine as relevant for its auditing activity. Each entry could come along with a commentary field for documentation purpose of the current status of the according finding as well as a traffic light to indicate the potential risk assigned to the underlying control weakness, i.e., the severity of the exception identified. In an additional status field, the responsible

auditor can adjust the state of the finding depending on whether the issue is e.g., pending, closed or due. Further information provided can be a.o. the management in charge of the control or audit item, the time of the alert, as well as the subscribing auditing parties. Opening the alert itself links to the automated audit routine and hereby provides a transparent audit trail to all auditors having subscribed to the routine allowing all auditors to rely on the results displayed.

Title of alert	Time	Responsible Management	Severity	Status
Audit routine AR1204: Transaction limit breach	09.28.2016, 12:00 pm	Unit A		under investigation
Audit routine AR0706: Branch key	09.28.2016, 10:05 am	Unit B		issue solved
Audit routine AR2204: Unprocessed transaction	09.28.2016, 07:04 am	Office Honolulu		under investigation
Audit routine AR1133: Update documentation	09.28.2016, 06:30 am	Unit C		irrelevant
Risk indicator RI0112: Time delay project Maui	08.28.2016, 03:11 pm	Unit D		under investigation
Audit routine AR4371: Default counterparty	08.28.2016, 01:04 pm	Unit E		under investigation
Risk indicator RI2823: Breash threshold sick days	08.28.2016, 12:55 pm	Unit F		due
Audit routine AR4711: User log-in during absence	08.28.2016, 10:13 am	Unit G		erroneous audit routine

Details of alert	
Title of alert	Transaction limit breach
Time of alert	09.28.2016, 12:00 pm
Rationale behind alert	Transaction nr. 2376 breaches limit (>100.000 USD). No additional senior management approval.
Responsible management	Unit A
Severity	VaR = 3.2 Mio USD

Status		Subscribers	
under investigation	<input checked="" type="checkbox"/>	Internal audit	<input checked="" type="checkbox"/>
irrelevant	<input type="checkbox"/>	Financial statement audit	<input checked="" type="checkbox"/>
issue solved	<input type="checkbox"/>	Supervisory audit	<input type="checkbox"/>
due	<input type="checkbox"/>	Tax auditor	<input type="checkbox"/>
erroneous routine	<input type="checkbox"/>		

Adjust routine/indicator	Issue solved
--------------------------	--------------

Figure 1: Generic example of a real-time Alert Log

- b. The real-time **“Dashboard”** displays the result of the Ongoing Risk Assessment based on the automated risk indicators. This enables the auditors to continuously assess the control risk of all relevant audit items on different aggregated levels. This module serves auditors as a common base for the ongoing, risk-adjusted audit planning in order to achieve an optimum allocation of resources. Unlike in the traditional audit process audit planning in a CA environment does no longer

consist of changing audit cycles but e.g., by adjusting the detail level of audit routines or the adjustment of thresholds of risk indicators. Each auditing party can subscribe to any audit item considered as relevant to integrate it into the individual dashboard and define its own thresholds for risk values depending on the prevailing risk tolerance.

Audit items		Risk classification		
[-]	Processes	●	●	●
[+]	Processes Front Office	●	●	●
[+]	Processes Middle Office	●	●	●
[+]	Processes Back Office	●	●	●
[-]	Systeme	●	●	●
[+]	ERP system	●	●	●
[+]	Limit management system	●	●	●
[+]	Trading system	●	●	●
[+]	Accounting system	●	●	●
[+]	Further systems	●	●	●
[-]	Organisationseinheiten	●	●	●
[+]	Sales	●	●	●
[+]	Marketing	●	●	●
[+]	Controlling	●	●	●
[+]	Human Resource	●	●	●
[-]	Produkte	●	●	●
[+]	Products business clients	●	●	●
[+]	Products private clients	●	●	●
[+]	Products institutional clients	●	●	●
[-]	Projekte	●	●	●
[+]	IT projects	●	●	●
[+]	New product projects	●	●	●
[+]	HR projects	●	●	●
[+]	Task forces	●	●	●

Figure 2: Generic example of a real-time Dashboard

- c. The **“Risk landscape”** can be used by auditors to assess the current risk exposure of the company for the purpose of audit planning but also in order to be in a position to question the risk strategy of the management as a critical counterpart. Based on the Ongoing Risk Assessment, which can also include data prepared by the risk management department of a company, real-time data on the current inherent risk exposure of the company is displayed. Relevant risk categories

depend on the specific industry and can range from operational, liquidity, market, counterparty default, reputational, legal or political risk. Depending on the availability of data from risk controlling or risk management unit auditors can e.g., refer to the concept of value at risk. The risk landscape enables auditors to assess the current risk exposure of the company not only for the purpose of audit planning, but also in order to be able to question the risk strategy of the management as a critical counterpart.

A holistic assessment of the risk landscape also includes the assessment of the risk management processes in the company to enable auditors to assess the actual residual risk profile. The real-time data to assess the risk management process by risk category can be automatically derived from the data available in the alert log, like number, gravity and status of a finding in the relevant risk management processes. To anticipate trends in risk exposure the results can be supplemented with historical data.

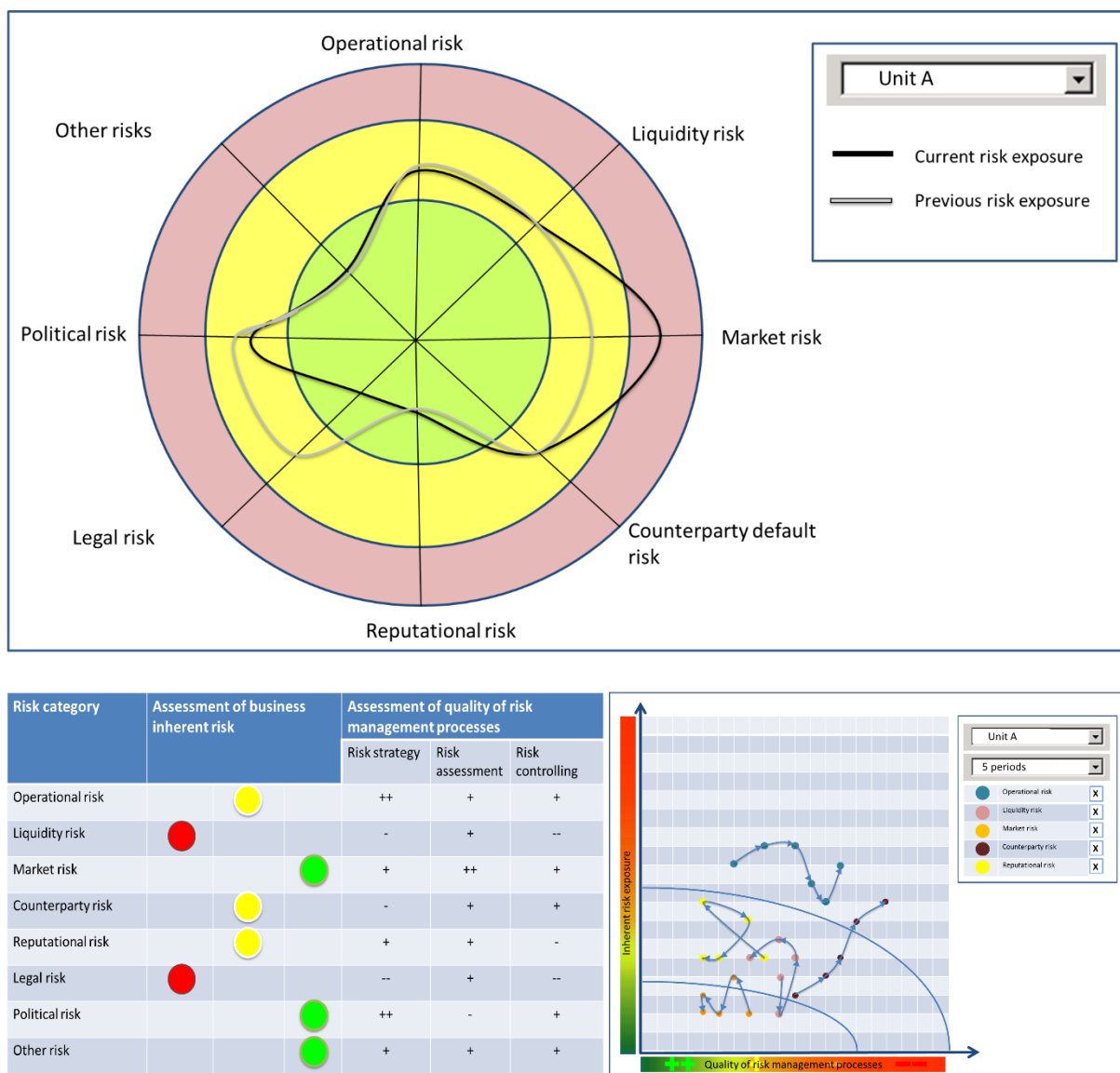


Figure 3: Generic example for a Risk Landscape

3.2. Auditing Process: Rethinking The Collaboration Between Auditors

According to the IIA's definition of CA as "any method used by auditors to perform audit-related activities on a more continuous or continual basis" (IIA 2005, S.7), CA penetrates the entire auditing process – beginning from audit planning, the audit itself, the reporting and the follow up process. Unlike the traditional audit approach, the methodology shift enables a close horizontal collaboration of internal and external auditors throughout the value chain of the audit process.

3.2.1. Audit Planning and Scoping

In a CA environment the operational audit planning is not based on a periodic plan, like an annual or multiannual audit plan, but can be fully dynamic over time. In the traditional audit approach external auditors can use the annual and multi-annual plan of internal auditors to ex ante reconcile audit activity in order to prevent unnecessary double auditing and to identify potential audit gaps. The scoping of an audit is often derived by screening previous audit reports in the same audit field. Given that the transaction costs for the exchange of information determine the intensity of collaboration, in a traditional audit environment not all potential synergies can be leveraged due to the non-standardized design for the exchange of relevant information.

Additionally, the methods applied by internal audit to assess the risk of audit items in the existing audit approach may complicate collaboration with external auditors. Internal audit risk assessment often includes to a high extend professional judgments to assess risks in given risk categories. COSO (2012) estimates these judgements as highly subjective due to judgement traps in the process of decision making as well as biases. As judgements are also often not transparent to third parties and can hardly be reproduced, external auditors cannot rely on these results for their own work.

The ICAA enables all auditors to use the same risk indicators for audit planning. As internal as well as external auditors have access to the results of the risk assessment through the dashboard and the risk landscape, a redundant and manual risk assessment by each auditing party will not be required. By subscribing to an audit item external auditors can use the results of the related risk indicators and enter into an automatized collaboration. As the algorithm behind the risk indicators is objective and reproducible, external auditors can rely on the results of the risk assessment. Still the results of the commonly used dashboard can be

translated – depending on the focus of the audit activity and the risk tolerance – into independent audit approaches by each auditing party.

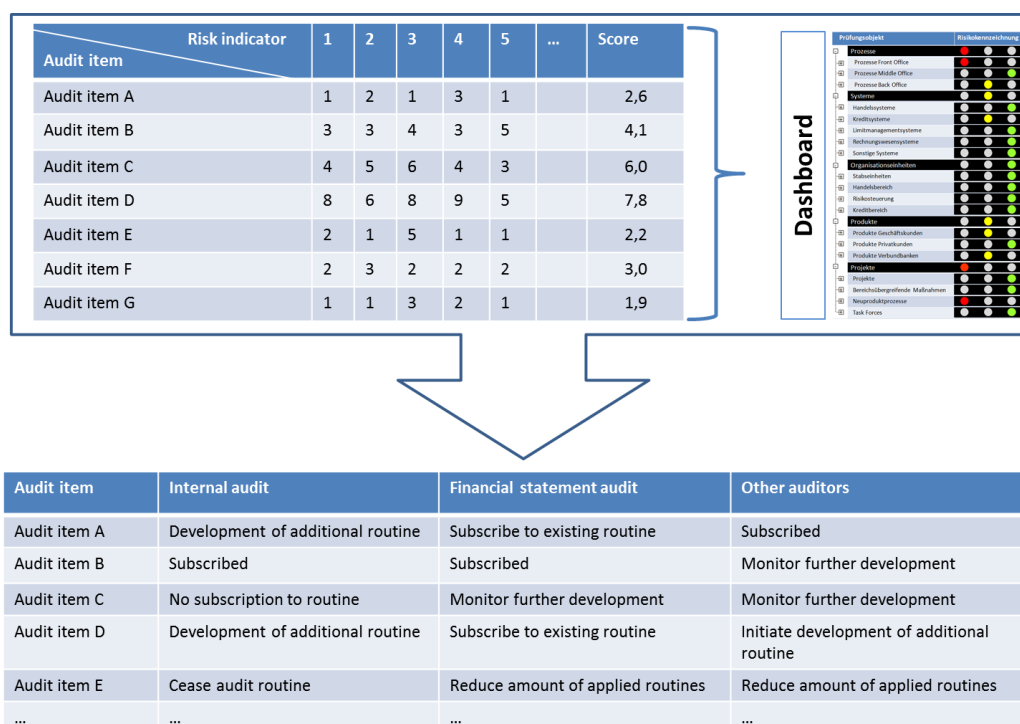


Figure 4: Deriving different audit approaches based on a common real-time “Dashboard”

3.2.2. Audit fieldwork

The traditional audit approach does not allow intense collaboration, especially because external auditors can only use audit activities of internal audit for its work, if he convinced himself of the professional expertise, objectivity and professional diligence of internal audit. The higher the degree of objectivity and level of competence, the more likely the external auditor may make use of the work of the internal audit function (IAASB 2010).

In a CA environment the phase of conducting an audit as known from the traditional audit approach will be omitted as routines are running automatically as part of the Ongoing Control Testing. The designing and implementing of CA routines will replace the traditional audit examination. The common use of transparent routines through the alert log allows

auditors to abstain from double audits. As all auditing parties have access to all relevant routines through the alert log, a full picture of the audit activities can be provided to all auditing parties. This additionally prevents audit gaps and reinforces transparency.

3.2.3. Reporting and Follow Up

The traditional audit is characterized by independent drafting of reports by internal and external auditors. Each party manually and separately reports on the result of its auditing activity to its stakeholders, using its own reporting formats, terminology and criteria to assess the severity of audit findings. Although in reporting a coherent terminology is known as a key factor of success, differences in the used terminology – regarding the severity of audit findings as well as the underlying assessment criteria – lead to reporting inconsistencies when stakeholders are assessing the findings. Additionally, reporting is to a certain degree redundant as auditors refer to the findings of other parties and to a certain extent cover the same audit fields.

Using a CA approach will bear the potential to move to a common real-time reporting design that is completely automated. For each breach of testing rules, the responsible management will automatically and instantly receive a notification. Alternatively, read-only access for the alert log can be assigned to the auditees. For severe control weaknesses and breaches of risk thresholds, top-management and audit committee can also get informed in real-time. The automated and central reporting to relevant stakeholders furthermore saves resources by excluding redundancies and inconsistencies. It further facilitates interpretation by using a common risk and reporting terminology through a single reporting tool for internal and external auditors.

For the follow-up process – aiming at monitoring if responsible management is taking the agreed upon measures – synergies can be leveraged too. The common use of the CA

Platform enables a centralized follow-up of all audit findings and replaces a decentral follow-up process and database by each auditing party as well as the according redundant reconciliation processes.

3.3. Auditors' Roles: Readjusting The Responsibilities Of Auditing Parties

The new collaboration design makes a readjustment of the roles of auditing parties necessary in order to leverage the full potential of the approach. The shift in responsibilities enables an optimum allocation of audit resources and hence increases audit efficiency.

3.3.1. Internal Audit

The ICAA approach bears a lot of potential for internal audit to strengthen its role in the corporate governance structure and to generate significant additional value for stakeholders. The following opportunities could arise for internal audit:

- **Take process and system responsibility for CA platform**

Process- and system wise internal audit should take the overall responsibility for the newly established CA system, i.e., the development, testing, update and ongoing development of the CA platform, especially its tools, routines and indicators. This includes the technical implementation of the CA system as well as the company specific design and definition of relevant data. Due to its expert knowledge regarding the responsibilities within the companies, processes, its IT-landscape as well as the network, internal audit is best suited to carry this role. Against this background internal audit should also be mandated with designing routines or indicators external auditors consider to be relevant for their auditing activities. To increase the robustness of automated alerts internal audit should – as part of its responsibility for the ongoing development of the CA system – also be in charge to develop statistical analyses that

can identify patterns by scrutinizing the produced exceptions. Especially during the implementation phase, many exceptions can turn out to be false positives until the outcome of the CA routines and indicators is robust.

- **Serve as single point of contact in the ICAA**

In the ICAA internal audit could serve even more as an instrument for the audit committee to coordinate the activity of internal and external auditors. Due to its knowledge lead and its positioning at the interface of internal monitoring/auditing system and external audit system, internal audit is predestined for this coordinating role. Additionally, internal audit has a unique overview of the basic population of control testing routines and risk indicators in use of any auditing party and hence is able to minimize the risk that different risks are not sufficiently covered or erroneously not covered at all by internal or external auditors.

- **Become information manager regarding risk relevant data**

At the interface between internal and external control system, internal audit is responsible for analysing the available data and assess what data is applicable for audit routines and risk indicators. Unlike in the traditional system a lot of non-standardized and cost and time consuming interaction – between internal and external auditors, audited management, management board, audit committee as well as among different auditors – can be omitted by putting internal audit into the position of a central information manager for risk related information for almost any member of the internal and external control system.

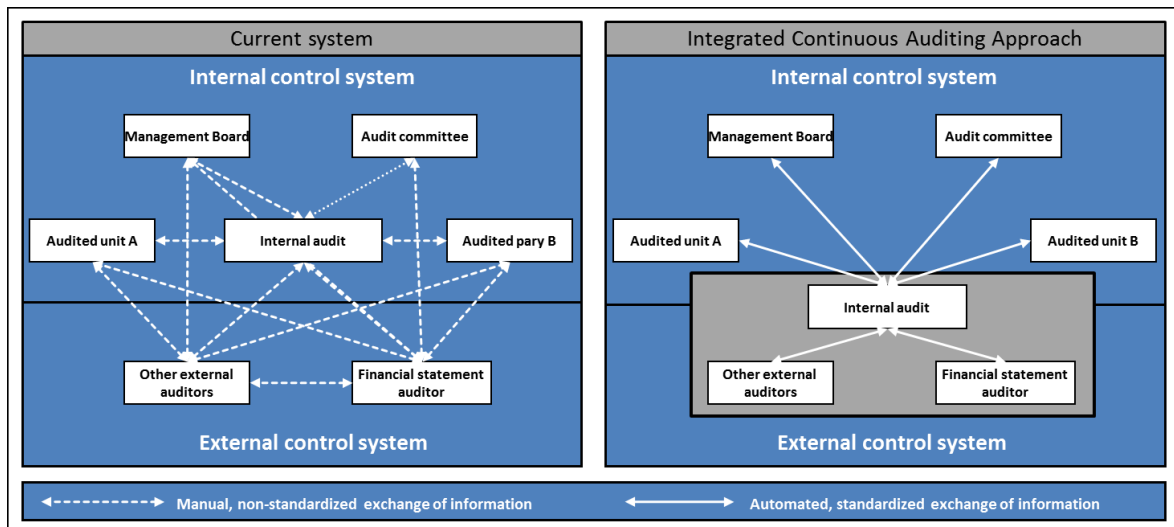


Figure 5: Internal audit as central information manager regarding risk relevant data in the ICAA

- **Increase focus on risk management and risk strategy**

With the CA platform internal audit has tools at its disposal to continuously assess risk management as well as the risk strategy on an ongoing basis. The risk landscape enables auditors to assess the current risk exposure of the company for the purpose of audit planning, but also in order to challenge the risk strategy of the management. Especially risk-intensive businesses like the financial sector, where neither internal auditors nor financial statement auditors or regulatory auditors were able to identify vast risk taking, could benefit from this development.

3.3.2. External audit

The ICAA additionally opens new opportunities for the development of external auditors to add additional value to its stakeholders.

- **Testing internal audit with regard to process and system responsibility for the CA Platform**

External audit will overtake the review and assessment of the operability, effectiveness and appropriateness of internal audit. With regard to the CA platform,

the external auditor has to address questions like: Does internal audit have sufficient personal and technical resources to perform its duties around the CA platform? Does the audit universe include all relevant audit items? Are all risk indicators applied valid to reflect the risk related to audit items? Are the applied audit routines able to assess if controls are suitable and effective? Are risk indicators and audit routines adjusted when changes in the respective audit items occur? Did external auditors receive all alerts from routines and indicators they have subscribed to?

In order to test the process and system responsibility of internal audit for the CA platform, the external auditor can apply own CA routines and risk indicators that are integrated into the CA platform and use the same IT-infrastructure. Those audit routines remain completely excluded from access through internal audit. To ensure independence of external auditors, it remains subject to its discretion if external auditors rely on the results of the CA Platform. In case of serious concerns about the reliability, external auditors have to withdraw from using the CA platform.

- **External audit as customer of internal audit**

Based on its comparative advantage as knowledge leader, internal audit could get mandated with implementing audit routines and risk indicators for external auditors. To establish this process as illustrated in figure 6 external auditors will have to define the requirements based on which internal audit starts the implementation. External audit will have to give its approval before the audit routines and risk indicators can be activated and applied. Subsequently the routine or indicator will be available for every auditing party which subscribes to it.

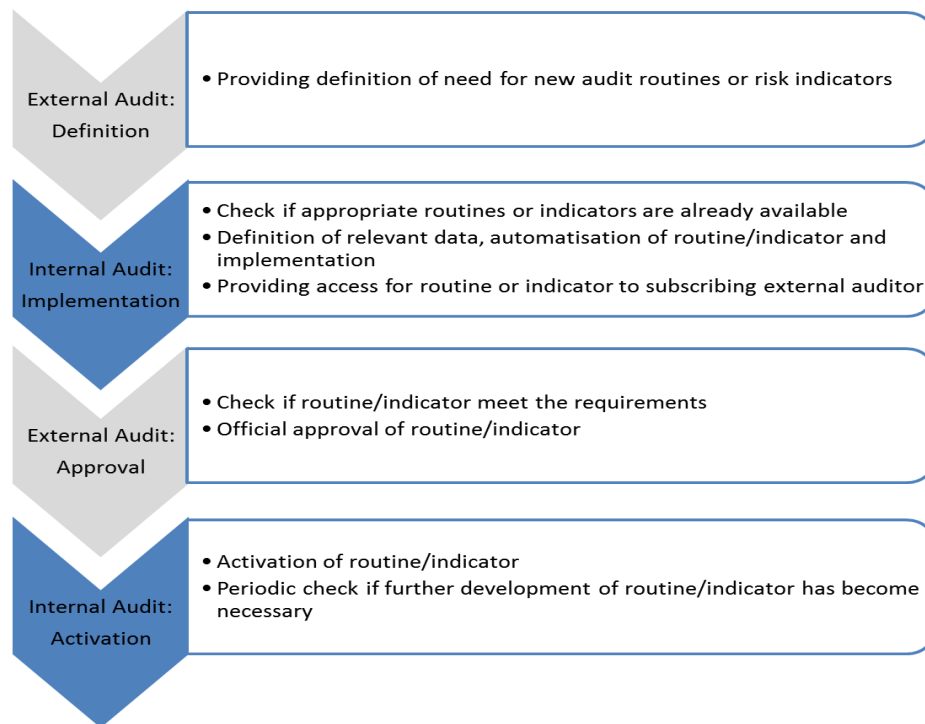


Figure 6: Process of mandating internal audit with implementing audit routines or risk indicators into the CA platform

Besides the implementation, internal audit should also be responsible for the development and adjustment of existing audit routines and risk indicators. For material changes on routines or indicators subscribed to by external auditors, an additional process has to be established to ensure that the adjustment gets approved. These processes ensure transparency for external auditors and hence enable external auditors to make use of the results from the audit activity converging in the CA Platform, although the process responsibility remains with internal audit. Hereby external auditors can place more reliance on the work of internal auditors to enhance external audit efficiency and reduce audit costs. Additionally, this process makes manipulation of results of routines/indicators through auditors almost impossible. Results cannot be distorted as they directly appear in the alert log without having to pass an internal audit assessment beforehand. Additionally external auditors can cease

operational audit activity to a great extent and at the same time focus on a more efficient audit planning and interpretation of the identified control weaknesses.

- **Stepping towards assurance on Continuous Online Reporting**

Although accounting research has identified various problems with a higher frequency in reporting, e.g., potential legal liability and competitive disadvantages due to increased disclosure (Alles et al. 2002), there is clearly a presumption that a significant amount of unmet demand exists for timely financial reporting (Alles et al. 2004(b)). The integration of external audit into the CA platform enables external audit to continuously audit the quality of financial controls and basic populations of data. The shift in methodology forms the basis to continuously assess the financial reporting and the financial situation of the company. In a first step financial statement auditors will be able to certify the financial report and statement close to the reporting date. In a second step external auditors will be enabled to provide ongoing assurance to stakeholders e.g., through the internet on the financial reporting of a company. This scenario can especially become relevant in an XBRL-based online reporting scenario, in which continuous reporting supplements or eventually even replaces the annual audit report (Elliot 1997).

3.3.3. Further auditing parties

Other external auditors, e.g., supervisory auditors or tax auditors, could also join the ICAA by using the CA Platform. As for the financial statement auditors, transparency and reproducibility form the base for a close collaboration and reliance on the results of routines as well as indicators. Especially for regulated industries, like the financial services industry, audit and supervision efficiency can increase when supervisory auditors closely collaborate with internal audit and enter into a system of continuous supervision.

4. CONCLUSION

Going beyond the existing concepts of adoption, the paper illustrates the full potential of CA. The derived ICAA allows to leverage the benefits of the methodology shift itself as well as additional synergies with regard to the subordinated challenges auditors are currently facing. The way internal and external audit can collaborate throughout the auditing process can tremendously improve through a new collaboration design, if the principle of transparency is considered when adopting CA. Furthermore, internal audit can strengthen its position within the corporate governance structure and is in the best position to take over new responsibilities for the CA platform. Adjusting the roles of auditors will also change the responsibilities of external auditors. The achievable higher audit efficiency can add significant value to all stakeholders. Additionally, the paper has shown which tools auditors will need to best perform CA activities in order to leverage the full potential of CA.

In the near future, audit standard setters should no longer just focus on the already well-described benefits of the methodology itself, but develop guidance on the full picture of a future CA environment. This picture has to include the impact on collaboration between auditors and also refer to the consequences on the roles of auditing parties. Practitioners should be aware of that even today the potential decrease in costs for external audits can contribute to amortize the costs of implementing an ICAA: Empirical evidence has shown the use of CAAT or CA by internal audit can lead to lower audit fees due to a higher reliance of external auditors (Malaescu and Sutton 2015). When starting to implement CA, internal audit should actively involve external audit to pave the way to leverage the synergies in collaboration as described in this paper. The ICAA can serve as vision when establishing and reconciling CA processes between auditing parties.

To better understand how to design the collaboration among internal and external auditors in a CA environment, future empirical research will be needed to better understand if and under which conditions external auditors rely on CA performed by internal audit.

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