

ANALYSIS OF CONTINUOUS AUDITING IMPLEMENTATION IN THE PUBLIC SECTOR: A CASE STUDY OF THE MINISTRY OF ABC

Sri Suharto¹

School of Accounting Master of Accounting Bina Nusantara University, Jakarta,
Indonesia

sri.suharto@binus.ac.id

Heny Kurniawati²

School of Accounting Master of Accounting Bina Nusantara University, Jakarta,
Indonesia

hkurniawati@binus.edu



Abstract

Public organizations face challenges in budget management accountability, including the continuously increasing budget, recurring findings of budget management non-compliance, dispersed work units across Indonesia, and limited auditor human resources. This case study aims to provide an understanding of the effectiveness of continuous auditing implementation in the public sector, particularly within the Ministry of ABC. The Ministry of ABC plays a strategic role in governance, involving functions such as planning, fund allocation, monitoring, and controlling development planning. From the budget management perspective, it is not excessively large but has complexity due to managing funds sourced from pure domestic currency and foreign loans and grants. To achieve the research objectives, we conducted interviews with auditors, made observations, and reviewed documents related to the implementation of continuous auditing in the organization. The research findings indicate that the implementation of continuous auditing in the ministry has largely reached level IV (continuous auditing) for five criteria, namely data access and retrieval, automated auditing and analysis methods, internal audit unit, audit objectives and human resources, and there is one criterion at level III (structure analysis), namely the audit approach and monitoring. Level IV indicates that the organization's internal control has been institutionalized into continuous auditing by conducting continuous testing and reporting internal control. Internal audit has used advanced analytical methods, developed audit plans, and dashboards for visualizing the results of data analysis and trends. Based on the research results, it is expected to provide lessons learned to enhance budget management accountability and best practices for other government agencies to adopt continuous auditing methodologies.

Keywords: Continuous Auditing, Implementation Analysis, Public Sector, Budget Management Accountability, Ministry of ABC

INTRODUCTION

Public sector organizations face significant challenges in ensuring accountability in budget management. These challenges include the increasing budget amount, recurring findings of non-compliance in budget management, the widespread distribution of work units across Indonesia, and the limited number of auditors. This case study aims to provide insights into the effectiveness of implementing continuous auditing in the public sector, particularly within the Ministry of ABC. The Ministry of ABC plays a strategic role in governance, encompassing functions such as planning, funding allocation, monitoring, and controlling development planning. Although the managed budget is not excessively large, it presents complexity due to the need to manage funds sourced from both domestic currency and foreign loans and grants.

Efforts to maintain accountability and achievements face various challenges. First, in terms of budget sources, the total budget managed, including funds from domestic sources, loans, and foreign grants, has consistently increased each year. Between 2007 and 2017, the budget increased by 560%. Second, the number of work units (satker) responsible for budget management has also grown. Initially, there was only one work unit in 2007, but by 2011, this number had sharply increased to 33 deconcentration fund work units and 3 central office work units. The rise in budget value and the number of work units in the Ministry of ABC has posed challenges to internal oversight. The growing volume and variety of financial transactions have led to an increase in the required audit sample size, making internal supervision more complex.

Moreover, the external audit findings from the Supreme Audit Agency (BPK) on the financial statements of the Ministry of ABC indicate that there are still numerous audit findings, including recurring issues. These findings pertain to internal control systems and compliance with laws and regulations. The audit results highlight weaknesses in budget management, emphasizing the need for audit methods and tools that can prevent issues and provide an early warning system for budget implementation in the Ministry.

The role of internal audit is crucial in maintaining budget implementation accountability through assurance and consulting activities. According to the Institute of Internal Auditors (IIA, 2016), internal audit is an independent and objective assurance and

consulting activity designed to add value and improve an organization's operations. The Government Internal Supervisory Apparatus (APIP), as the internal audit function, plays a significant role in fostering governance, risk management, and control to provide added value to the government.

To fulfill this role, internal audit conducts assurance activities, including audits, reviews, evaluations, and monitoring, to ensure compliance and the effectiveness of government operations. In maintaining accountability, internal audit is involved in several key stages. During the planning stage, internal audit reviews the ministry's budget work plan to ensure alignment with standards and performance indicators. In the implementation stage, internal audit provides consulting and audit activities to ensure budget execution adheres to regulations. Finally, in the accountability stage, internal audit reviews financial statement preparation to ensure compliance with accounting standards.

To address these challenges, the Inspectorate General of the Ministry of ABC has adopted an information technology innovation in the form of continuous auditing, with the expectation that internal supervision activities will become more effective and efficient. Continuous auditing can provide an early warning system for organizations and enable rapid and comprehensive substantive testing of financial transactions in ministries/agencies, thereby identifying red flags for non-compliance with established criteria.

Continuous auditing originated in the 1990s when the auditing profession began adopting data analytics to assist in testing the effectiveness of internal controls (Coderre David, 2005). Rezaee et al. (2018) define continuous auditing as an electronic auditing process supported by information technology, allowing auditors to provide assurance on information continuously and disclose findings in real-time. The implementation of continuous auditing shifts the traditional audit paradigm, which is typically periodic, post-audit, and based on sampling methods. Continuous auditing is expected to overcome these weaknesses by leveraging information technology.

First, continuous auditing enables real-time assessment of organizational controls and risks with a larger sample size. Second, continuous auditing represents technological innovation and automation of traditional audit processes (Chan & Vasarhelyi, 2018). Continuous auditing consists of four stages: audit procedure automation, data modeling and

benchmark development, data analysis, and reporting. This approach allows auditors to provide continuous assurance on information and disclose findings immediately (Rezaee et al., 2018).

The implementation of continuous auditing can be measured using a maturity model with five stages: initial, ad hoc, defined, managed, and optimized (Mantelaers & Zoet, 2018). Wiegerinck (2019) suggests that an organization's readiness to implement continuous auditing depends on its internal control maturity level, which consists of five stages: initial profiling, ad hoc analysis, structured analysis, continuous auditing, and advanced continuous auditing.

In the Netherlands, Khargi (2010) described successful continuous auditing practices in companies, stating that key considerations for implementing continuous auditing include a focus on control, achieving a maturity level of "managed" or "optimized," and obtaining support from management and employees. If full audit automation is not feasible, manual reviews are still necessary. According to Wiegerinck (2019), continuous auditing is an internal audit approach that enhances audit effectiveness and integration by continuously utilizing technology and retrieving data from an organization's information systems. The continuous auditing process involves four stages: data acquisition, data extraction, transformation and loading, data analysis, and reporting.

Bozkuş et al. (2020) examined continuous auditing in the public sector in Turkey and found that the internal audit function in the Ministry of Agriculture and Forestry has adopted continuous auditing software to facilitate the audit process. Internal audit has transformed from manual audit procedures to data analytics tools that generate insights by analyzing data with business process algorithms. Despite its positive impact and benefits, the implementation of continuous auditing remains a challenge, particularly in the public sector and government institutions.

REVIEW OF LITERATURE

Agency theory explains the relationship between management as the agent and the company's owners as the principal (Jensen et al., 1976). In the context of public sector budget management, the principal (the people) is represented by the Ministry of Finance, while the

agents are the technical ministries. Agency theory highlights the divergence of interests between the agent and the principal, which necessitates the role of internal audit in overseeing management to ensure that allocated budgets are used according to the work plan, development targets are achieved, and expenditures comply with regulations.

Internal audit is also related to stewardship theory, which describes a situation where managers, acting as stewards, prioritize collective interests and organizational goals over personal gain (Donaldson & Davis, 1991). This theory assumes a strong correlation between organizational satisfaction and success. Stewardship theory explains that management is committed to organizational objectives by establishing an internal audit unit that adds value and assists the organization in achieving its goals.

The Institute of Internal Auditors (IIA, 2016) defines internal audit as follows:

"Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes."

To enhance the effectiveness of assurance roles, internal audit is expected to utilize technology-assisted audit techniques. This aligns with the AAPII audit standards, specifically paragraph 1220 on professional diligence, point A2, which states that auditors should consider using technology-assisted audit techniques and other data analysis methods. These standards mandate that APIP (Government Internal Supervisory Apparatus) implement technology-assisted audit techniques, including continuous auditing.

Continuous auditing dates back to the 1960s when automated testing was introduced in audit activities through the installation and implementation of the Embedded Audit Model (EAM). This development continued into the 1980s when auditors began adopting a new approach to audit execution using Computer-Assisted Audit Tools and Techniques (CAATTs) for ad hoc investigations and analysis. By the early 1990s, the audit profession started incorporating data analytics to support the testing of internal control effectiveness (Coderre, 2005). Rezaee et al. (2018) define continuous auditing as a comprehensive electronic audit process that enables auditors to provide ongoing assurance on information while simultaneously disclosing findings in real-time. The AICPA (1999) describes

continuous auditing as a methodology that allows auditors to provide written assurance on a subject matter through a series of audit reports issued concurrently with, or shortly after, the underlying events occur. According to Chan and Vasarhelyi (2018), continuous auditing represents a technological innovation in the conventional audit process. Vasarhelyi et al. (2012) further elaborate that continuous auditing is a progressive shift toward automated auditing, leveraging technology to reduce costs and enhance audit automation. Rezaee et al. (2002) describe continuous auditing in terms of paperless, real-time accounting and financial reporting. Building on these explanations, Wiegerinck (2019) defines continuous auditing as a concept that brings the audit process closer to operational processes, utilizing technology to its fullest potential for audit automation. This enables auditors to provide continuous assurance on specific subjects while reducing audit costs.

The following table illustrates the key differences between traditional auditing and continuous auditing:

Table 1.
Illustrates The Key Differences between Traditional Auditing and Continuous Auditing

Traditional Auditing	Continuous Auditing
Frequency: <ul style="list-style-type: none"> ● Periodic 	Frequency: Continuous or more frequent
Approach <ul style="list-style-type: none"> ● Reactive 	Approach: Proactive
Procedures: <ul style="list-style-type: none"> ● Manual 	Procedures: Automated
Work and role of auditors <ul style="list-style-type: none"> ● The bulk of the work performed is centered around labor and time-intensive audit procedures ● Independent roles of the internal and external auditor 	Work and role of auditors: The bulk of the work performed is centered on handling exceptions and audit procedures requiring human judgment. The external auditor's role becomes the certifier of the continuous auditing system
Nature, timing, and extent: <ul style="list-style-type: none"> ● Testing consists of analytical review procedures and substantive details testing ● Controls testing and detailed testing occur independently ● Sampling in testing 	Nature, timing, and extent : Testing consists of continuous control monitoring and continuous auditing. Controls, monitoring, and detailed testing occur simultaneously The whole population is considered in testing.
Testing <ul style="list-style-type: none"> ● Humans perform testing 	Testing: Data modelling and data analytics are used for monitoring and testing
Reporting <ul style="list-style-type: none"> ● Periodic 	Reporting: Continuous or more frequent.

Wiegerinck (2019) outlines the continuous auditing process in four stages:

- a. Data Acquisition
- b. Data Extraction and Transformation
- c. Data Analysis
- d. Reporting

He further states that an organization's readiness to implement continuous auditing depends on its internal control maturity level. According to Ernst & Young, there are five maturity levels in implementing continuous auditing:

Initiate Profiling (Level I)

At this stage, the organization has basic internal control in place, but gaps exist between data analytics approaches, procedures, and methodologies supporting internal control. The organization lacks analytic tools and has limited human resources skilled in data analytics.

Ad Hoc Analysis (Level II)

The organization acknowledges the importance of internal control and has designed an internal control framework, but it is not yet structured. The use of data analytics tools is limited, and employees have basic skills in analytics.

Structured Analysis (Level III)

At this level, the organization has effectively implemented internal controls both in design and operations. It has developed formalized data analytics procedures and methodologies. Internal audit utilizes tools to monitor internal control implementation.

Continuous Auditing (Level IV)

Internal control is institutionalized, allowing the organization to conduct ongoing testing and report on internal control implementation. Both internal audit and management are involved in continuous monitoring, utilizing tools for audit planning and dashboard visualization of analytical results.

Advanced Continuous Auditing (Level V)

The organization has fully adopted continuous auditing on an ongoing basis. Internal audit and management can perform daily operational monitoring and effectively test both the design and operation of internal control.

The researcher will use a combined framework from the Continuous Auditing Maturity Model (Mantelaers & Zoet, 2018) and the Internal Control Maturity Level (Wiegerinck, 2019) with the following details:

Five levels of continuous auditing maturity will be applied to assess the organization's implementation stage.

Elements of continuous auditing will be evaluated using the internal control maturity model, with the addition of a human resources component to measure the organization's readiness in terms of skills and expertise.

This integrated framework aims to provide a comprehensive assessment of the organization's internal control effectiveness and continuous auditing implementation while considering both technological capabilities and human resources as critical factors.

Table 2.
Framework Maturity Continuous Auditing

Maturity Framework Based			
No	Internal Control	Continuous Auditing	Proposed Combination Framework
1	Internal audit department	System	Internal audit department
2	Audit Objective	Data	Audit Objective
3	Audit and monitoring approach	People	Audit and monitoring approach
4	Data capture and access	Organization	Data capture and access
5	Audit Automation	-	Audit Automation
6	Analytical Methods	-	Analytical Methods
7	-	-	People (human resources)

Key Elements and Implementation Strategies of Continuous Auditing

Mantelaers and Zoet (2018) argue that several key elements are necessary for the successful implementation of continuous auditing, including:

Systems and Technology

This aspect emphasizes the interconnection between existing information systems to ensure the flow of information into the system and access to the required data. This aligns with the findings of Soedarsono et al. (2019), which highlight the importance of data access in implementing continuous auditing.

Data

This aspect focuses on how data is analyzed, the potential analytical models, and the quality of data to be processed.

Organization/Process

This aspect emphasizes the strategy and objectives of continuous auditing/monitoring, ensuring alignment with business processes, goals, and organizational vision. This is similar to the process element described by Weigernick (2019), which states that internal auditors need to define which business processes will be subject to continuous auditing.

People

This aspect focuses on human resources (HR) who understand the purpose and requirements of continuous auditing and possess the information technology skills necessary for its implementation.

Benefits of Continuous Auditing

Chan and Vasarhelyi (2018) state that continuous auditing is a methodology that enhances the effectiveness and efficiency of the audit process. It enables audits to be conducted in real-time, allowing for early warning detection and producing more accurate, timely, and high-quality information.

Rezaee et al. (2002, 2018) highlight several advantages of continuous auditing:

- a. **Cost Reduction** – Continuous auditing lowers the costs associated with establishing audit procedures, allowing auditors to test a larger sample size (up to 100%) of client transactions more quickly and efficiently compared to manual testing.
- b. **Time and Cost Efficiency** – It reduces the time and cost needed for transaction testing and account balance verification.
- c. **Improved Financial Audit Quality** – By automating audit procedures, auditors can focus more on understanding the client's business, industry, and internal control structure.

- d. Ongoing Control Testing – Continuous auditing enables ongoing testing of control and substantive procedures throughout the year, rather than relying on periodic audits.

Wiegerinck (2019) further explains that continuous auditing reduces risk, as it allows 100% transaction testing, making the audit process faster and more efficient (Rezaee et al., 2002). Additionally, organizations implement continuous auditing primarily to reduce audit costs and time while improving productivity (Vasarhelyi et al., 2010). Continuous auditing also enhances financial reporting quality, providing valuable insights for stakeholders (Vasarhelyi et al., 2012) and assisting external auditors in understanding the client's business and internal control structure.

RESEARCH METHOD

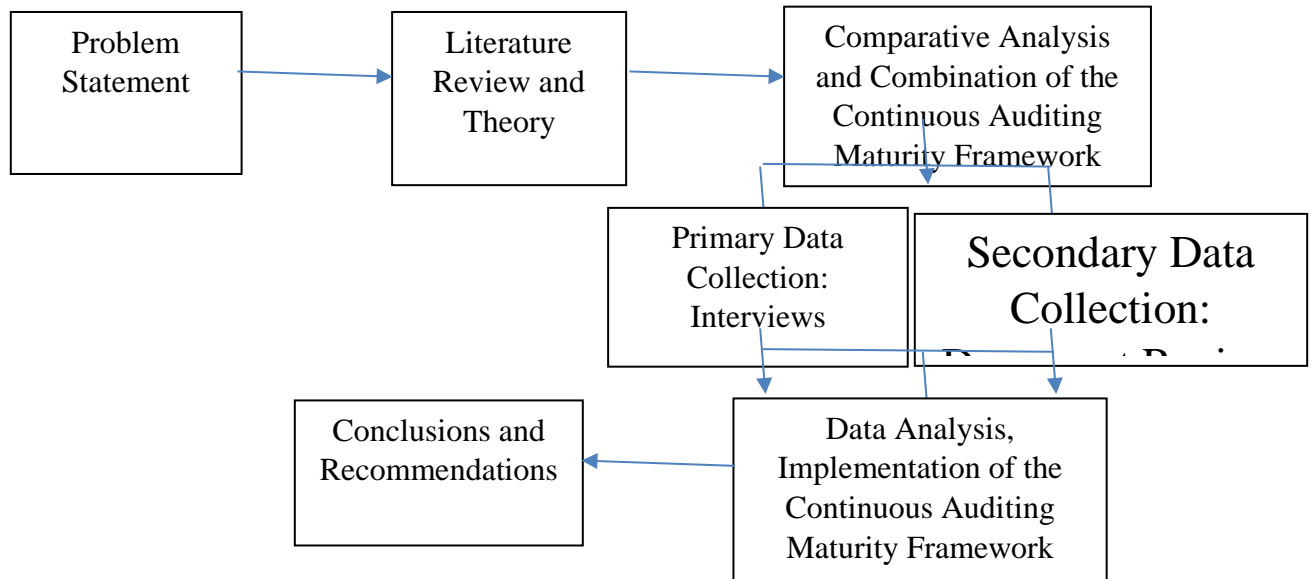
This study employs a case study approach using qualitative methods. According to Creswell (2016), qualitative research is a type of research that explores and understands the meaning behind individual or group experiences related to social issues. Creswell (2008) defines a case study as an exploration of related systems (bounded systems) or specific cases.

In this research, both primary and secondary data are used. Creswell (2014) classifies data sources as follows Primary data, which includes direct information obtained from individuals or situations under study. Secondary data, which consists of second-hand records or documents related to the research subject.

Research Steps

The general steps undertaken to address the research problem and objectives can be illustrated in the following diagram: (Insert diagram here).

Figure 1.
Research Steps



The data collection techniques used in this study include interviews, observations, and literature review. Interviews are a data collection technique in which researchers conduct face-to-face interviews with participants (Creswell, 2016). Data collection was carried out through in-depth individual interviews using a semi-structured method with respondents from the ABC Ministry as the research subjects. Observation is an effort to collect data by directly going into the field to observe the behavior and activities of individuals at the research location (Creswell, 2016). The requested documents are qualitative documents, which can be either public or private documents (Creswell, 2014). In addition to using primary data, the researcher will also utilize secondary data to support the research activities.

In this study, the researcher tested the accuracy or validity of the findings using two strategies: data source triangulation and member checking. Data source triangulation was conducted by verifying interview findings with other data sources, such as activity reports, to assess the truthfulness and validity of the obtained information. Member checking was used to ensure the accuracy of research findings by presenting them to participants and asking them to review the interview transcripts and coding results for accuracy.

To ensure reliability, the researcher employed transcript verification and coding accuracy checks. Transcript verification involved cross-checking interview transcripts

against recorded interviews to ensure that no errors occurred during transcription. Coding accuracy checks were conducted to confirm that there were no deviations in code definitions or shifts in meaning throughout the coding process. Accuracy was ensured by carefully reviewing interview transcripts and documentation within predetermined themes.

For data analysis, the researcher utilized the Nvivo 14 software, following these steps:

- a. Data Import – Uploading interview transcripts into Nvivo for data management.
- b. Data Coding – Exploring and coding the interview transcript documents.
- c. Theme Development – Grouping and analyzing coded data into relevant themes.
- d. Result Presentation – Visualizing analysis results in the form of graphs or diagrams using the project map feature.
- e. Conclusion Drawing – Interpreting findings based on the analyzed data.

RESULTS AND DISCUSSION

RQ1: Maturity Level of Continuous Auditing Implementation at the ABC Ministry

Based on the analysis of secondary data from obtained documents, the internal audit department of the ABC Ministry has implemented continuous auditing since 2016, starting with the development of programming tools and later adopting data analytics software in 2019. The development and implementation of continuous auditing followed several stages, including identifying business processes, understanding user and programming requirements, conducting testing, determining assurance levels, launching, and following up on continuous auditing. The scope of continuous auditing implementation focuses on compliance testing of financial transactions to support financial reports that adhere to accounting standards, are accountable, and comply with regulations.

To measure the level of continuous auditing implementation at the ABC Ministry, we used a framework combining the Continuous Auditing Maturity Model (Mantelaers & Zoet, 2018) and the Internal Control Maturity Level (Wiegerinck, 2019), with the following details:

- a. Utilizing five maturity levels of continuous auditing.
- b. Incorporating the internal control maturity level framework while adding the element of human resources. This consideration was made because the internal control framework already includes system, data, and organizational elements, whereas the human factor

(people) plays a crucial role in the development and implementation of information technology.

Table 3.
Framework Usulan Maturity Level Continuous Auditing

No	Framework Usulan Maturity Level Continuous Auditing
1	Internal audit department
2	Audit Objective
3	Audit and monitoring approach
4	Data capture and access
5	Audit Automation
6	Analytical methods
7	People (human resources)

The measurement results of the maturity level of Continuous Auditing Implementation at the ABC Ministry indicate that three criteria have reached Level IV of continuous auditing. These criteria include data access and retrieval, audit automation, and analysis methods. Meanwhile, the criteria for the internal audit unit, audit objectives, and human resources have achieved 70% at Level IV. One criterion, audit approach and monitoring, remains at Level III (structure analysis), while 30% of the internal audit unit, audit objectives, and human resources are also at this level.

Table 4.
Provides A Detailed Breakdown of the Continuous Auditing Maturity Level Measurement Results

No	Uraian	Level Maturitas Continuous Auditing menurut												
		Partisipan									R10	R11	R12	R13
		R1	R2	R3	R4	R5	R6	R7	R8	R9				
1	Internal audit department	IV	IV	IV	IV	IV	IV	IV	IV	IV	III	III	III	III
	-Design													
	-Operational effectiveness													
	-continuous testing													
2	Audit Objective:	IV	IV	IV	IV	IV	IV	IV	IV	IV	III	III	III	III
	-To provide periodic assurance													
	-By means of manual audit procedures													
	-By means of verification of the quality of specific internal control													
3	Audit and monitoring approach:	III	III	III	III	III	III	III	III	III	III	III	III	III
	-Periodic auditing													
	-Periodic monitoring													
	-Continuous auditing													
	-Continuous control Monitoring													
4	Data capture and access:	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
	- Data is captured during the audit process													
	- Possible data access limitations													
	- Systematic and continuously data captured													
5	Audit Automation:	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
	-manual audit processes													
	-Automated specific audit process													
	-Room for extending the scope of automation													
	-Exception of audit process when result human judgement													
6	Analytical methods:	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
	-Basic methods by means of simple tools													
	-advanced methods by means of advanced tools													
7	People (human resources)	IV	IV	IV	IV	IV	IV	IV	IV	IV	III	III	III	III
	-Understand the objective and requirements of continuous auditing													
	-Must have skills to analyze data and identify the most important control elements and risk areas													

Explanation:

R1–R13: Respondents who were interviewed.

Level III and IV: The maturity levels of continuous auditing based on the analysis of interview results.

Internal Audit Department

The document review and interview analysis conclude that the maturity of internal control has reached Level IV of continuous auditing. The detailed findings indicate that 70% of respondents stated they have achieved Level IV continuous auditing, while 30% placed it at Level III (structured analysis).

A review of the documents reveals that the ABC Ministry has an independent internal audit unit that performs both assurance and consulting roles. The internal audit function demonstrates strong capabilities, as shown by the Internal Audit Capability Model assessment, which places it at Level 3 (Integrated). This indicates that professional audit practices are uniformly established and aligned with standards. The outcome of this capability level confirms that the internal audit function can assess efficiency, effectiveness, and economy in programs/activities while also providing consultation on governance, risk management, and internal controls (Assessment by the Financial and Development Supervisory Agency).

Additionally, the internal audit function underwent an external peer review by another ministerial internal audit unit in 2016, receiving a score of 82.06%. This rating indicates that the ABC Ministry's internal audit function "Generally Conforms" to standards, meaning that its structure, policies, procedures, and implementation are materially aligned with detailed standards and the Code of Ethics.

Furthermore, the internal audit unit has implemented continuous auditing. Interview responses from participants confirm that the internal audit function utilizes continuous auditing techniques to conduct supervisory activities using data analytics, as illustrated in the following statement:

"The ABC Ministry has implemented continuous auditing by utilizing data analytics, using scripted programs in the form of continuous auditing modules to continuously assess compliance with expenditure realization at work units based on input cost standard criteria for APBN implementation."

This aligns with existing research findings that continuous auditing represents a technological innovation over conventional auditing by being more proactive and focused on high-risk business process areas (Chan & Vasarhelyi, 2018).

Audit Objectives

The document review and interview analysis conclude that the maturity of internal control has largely reached Level IV of continuous auditing.

A review of regulations, the audit charter, and the strategic plan of the ABC Ministry's Internal Audit Unit indicates that the unit already performs an assurance function. This function provides independent opinions based on objective evidence, primarily concerning governance, risk, and control in the execution of duties and functions. This service includes audits, reviews, evaluations, and monitoring. At each maturity level of continuous auditing, the objective of auditing is to provide assurance on financial reports (Vasarhelyi, 2012).

Interview responses confirm that internal audit at the ABC Ministry conducts assurance activities through continuous auditing, as reflected in the following statement:

"Continuous auditing is conducted periodically to test compliance with budget execution, budget planning, and financial reporting."

However, the continuous auditing process at the ABC Ministry is still conducted periodically, on a quarterly and semi-annual basis. Additionally, audit procedures are still performed manually, meaning that after identifying anomalous transactions, auditors must clarify and verify findings with source documents from the auditee.

Audit Approach and Monitoring

The document review and interview analysis conclude that the maturity of internal control has reached Level III (structured analysis).

The internal audit unit at the ABC Ministry performs its assurance role through audits and monitoring, but the approach remains periodic and focuses on historical transactions. While continuous auditing has been implemented in assurance activities, it is still conducted on a semi-annual basis.

This finding is supported by interview responses, which confirm that continuous auditing is performed periodically:

"The continuous auditing process is conducted quarterly or semi-annually in the form of assurance activities, such as reviewing the ministry/agency budget plan, reviewing procurement processes, and conducting specific audits to examine travel expense accounts and allowance payments."

The continuous auditing methodology applied by the ABC Ministry's Internal Audit Unit aligns with the four-stage framework proposed by Wiegerinck (2019): Data Acquisition – Emphasizing access to operational process data sourced from various information systems for continuous auditing. Data Extraction and Transformation – Data obtained from multiple sources require extraction and often come in different formats and types. Therefore, data files need to be transformed into a standardized and valid format for further processing. Data Analysis – The processed data is analyzed using continuous auditing tools based on the audit objectives and scope. Chan and Vasarhelyi (2018) further explain that data analysis is conducted to evaluate internal controls, detailed transactions, and financial statement accounts. At the ABC Ministry, data analysis is performed using continuous auditing scripts developed with the IDEA data analytics tool. Reporting – The auditor compiles the results of the data analysis into a report aligned with the established audit objectives and scope.

Data Access and Retrieval

The document review and interview analysis conclude that the maturity of internal control has reached Level IV of continuous auditing.

An examination of the audit charter and the roadmap for continuous auditing implementation indicates that the ABC Ministry's Internal Audit Unit has unrestricted data access, and the data retrieval process is conducted continuously through API integration and data import-export mechanisms.

The internal audit function has established roles and authority by creating an audit charter, which outlines the vision, mission, roles, authority, duties, and functions of the internal audit unit. This aligns with the statement from an auditor interview:

"The audit charter states that internal audit has the authority to obtain data in both document and digital formats for supervisory purposes."

The authority to obtain data and the access rights granted to the ABC Ministry's Internal Audit Unit are consistent with Vasarhelyi's (2012) research, which states that auditors can be granted access to organizational data to fulfill their audit responsibilities.

Audit Automation

The document review and interview analysis conclude that the maturity of internal control has reached Level IV of continuous auditing.

The ABC Ministry has integrated its internal audit processes with continuous auditing methods, leveraging technology to enhance assurance activities. The internal audit team has successfully developed automated audit procedures, including performance analysis and data modeling to detect anomalous transactions.

An auditor interview supports this conclusion:

"The ABC Ministry has implemented continuous auditing using data analytics, employing script-based audit modules to continuously assess compliance with budget realization in work units based on APBN input cost standards."

This statement is further supported by observations indicating that continuous auditing has been implemented in assurance activities at the ABC Ministry, which include:

Objective of continuous auditing: To assess the existence and compliance of financial transactions with regulations governing the state budget (APBN) execution.

Audit modules: Developed using IDEA audit software, performing tests on expenditure realization for various budget items, including in-office meeting expenses, package meetings, domestic and international travel, activity output honoraria, consultancy fees, other services, professional services, employee salaries, rentals, and other non-operational expenses.

Audit scope: Continuous auditing covers 80% of the organization's total budget.

Analysis Method

The document review and interview analysis conclude that the maturity of internal control has reached Level IV of continuous auditing.

A review of the information technology architecture reveals that the ABC Ministry's Internal Audit has developed advanced analysis methods. Analytical procedures are performed on data derived from various Enterprise Resource Planning (ERP) systems. The

data analysis process utilizes analytical software with Structured Query Language (SQL) and leverages the programming capabilities of IDEA software and Python scripting.

This analytical method is further supported by an auditor interview, where the auditor states:

"Initially, IDEA software extracts data from various database formats and converts PDF data into a database. Then, it performs analytics using statistical features such as join, filter, sum, average, Benford's law, etc. Customizations are made with audit modules using programming/script modeling to test the database with parameters like cost standards and regulations."

Human Resources

Human resources (HR) play a critical role in developing and implementing information technology. The ABC Ministry's Internal Audit has established a human capital development program, which outlines the competencies, knowledge, and skills necessary to become a modern internal audit (trusted advisory) (Prakoso & Khudri, 2022).

A review of the continuing education program report reveals that staff members already possess certifications in data analytics using IDEA audit software.

RQ 2: Key Success Factors in the Implementation of Continuous Auditing

The analysis of the development and implementation of continuous auditing within the Internal Audit of the ABC Ministry reveals several important elements that contribute to its success (Mantelaers & Zoet, 2018). These factors are:

Systems and Technology

Respondent interview results indicate that information systems have been implemented in the financial business processes at the ABC Ministry, facilitating the implementation of continuous auditing. This finding is consistent with the research of Widuri et al. (2016), which states that factors such as compatibility with existing IT platforms, alignment with tasks, auditors' attitudes toward audit software, company policies and support, as well as client needs and expectations, significantly influence the adoption of audit software. The development and implementation of continuous auditing can be more effective if data availability and system platform alignment are maximized. An interview with the auditor confirmed:

“The IT architecture designed by the Inspectorate General regarding Continuous Auditing aligns with the Ministry's strategic plan, where the Ministry encourages the use of electronic systems in business processes.”

Human Resources

The next key element in implementing continuous auditing is human resources. Continuous auditing is an automated audit method that replaces manual auditing processes. This method is designed and implemented by human resources. For successful implementation, organizations need specialized personnel with the necessary knowledge and skills. To form competent auditors with IT expertise, it is crucial to invest in human resource capacity through budgeting for education and training (Widuri et al., 2016). The adoption of continuous auditing technology is also influenced by the availability of competent human resources and the organizational learning culture (Prakoso & Khudri, 2022).

Data Access

Data plays a critical role for any organization implementing continuous auditing. It is a key factor in the development and implementation of continuous auditing because data serves as the foundation for analysis or auditing. Without data, continuous auditing cannot be realized (Wiegerinck, 2019). Access to high-quality data is essential to produce effective continuous auditing outputs. The compatibility of IT platforms and their high impact on the adoption of audit software was highlighted in the research by Widuri et al. (2016). The ABC Ministry's Internal Audit has access to data governed by an audit charter, ensuring the integrity and reliability of the obtained data.

Organization

The goals and strategies for developing and implementing continuous auditing must align with the organizational objectives (Mantelaers & Zoet, 2018). Document analysis reveals that the ABC Ministry has secured support in terms of budget, IT infrastructure, processes, reporting mechanisms, and policies that foster the development and implementation of continuous auditing. This aligns with the findings of Prakoso and Khudri (2022), which state that the adoption of continuous auditing is influenced by top-level management's support for policy and budget decisions.

RQ 3: Benefits of Continuous Auditing for the Organization

The benefits derived from the development and implementation of continuous auditing can be outlined as follows:

Efficient and Effective Audit Process

Internal audit has experienced significant benefits from the use and implementation of continuous auditing, making the audit process more efficient. This is in line with research by Wiegerinck (2019), which states that the process of collecting audit data, conducting substantive tests, testing transactions, and evaluating controls takes less time because it is done automatically. This was confirmed in the interviews with participants, who shared:

“It is efficient because continuous auditing speeds up data collection, analysis, and audit findings. It is effective because it allows auditing across the entire population and offers areas for improvement in financial reporting and compliance.”

The interview results indicate that with continuous auditing, the audit process becomes quicker, thereby reducing audit costs through the use of technology. Additionally, the period for auditing control and risk testing is shorter than in traditional manual audits.

Early Warning System (EWS)

The role of internal audit extends beyond simply reporting findings or anomalies. Auditors are also capable of solving problems and preventing issues or addressing them promptly in the current year. This implies that internal audits are more effective in providing an early warning system (EWS) to management. The importance of this was highlighted in the interviews, with participants stating:

“Continuous auditing greatly aids the Early Warning System (EWS) because it quickly provides results on irregular transactions. For example, continuous auditing can identify material and high-risk spending realizations.”

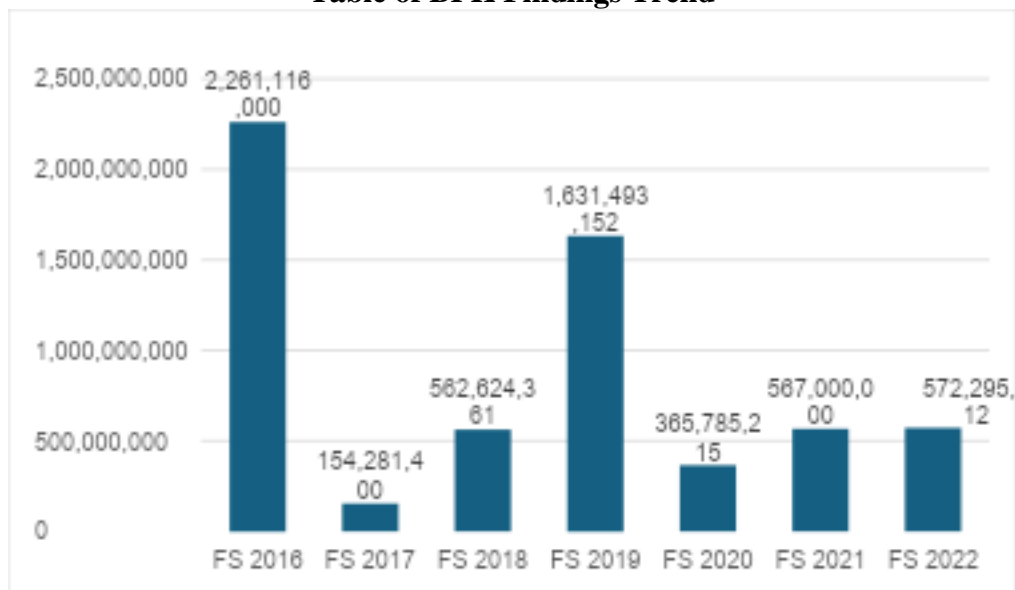
Thus, continuous auditing allows internal audits to be proactive in alerting management to potential issues, ensuring that corrective measures are taken promptly.

3. Improved Budget Compliance

The implementation of continuous auditing has also been reflected in the results of the Financial Audit Board (BPK)'s examination of the ABC Ministry's financial statements. Since continuous auditing was implemented in 2017, it has contributed to improved budget compliance, evidenced by a decrease in audit findings. Although there has been a slight

increase in findings in certain years, the overall trend shows a reduction. The following table illustrates the trend in decreasing findings from the BPK's examination:

Figure 2
Table of BPK Findings Trend



These results highlight the practical and positive impacts of continuous auditing, from making audits more efficient to helping improve financial compliance and providing proactive management insights through an early warning system. The conditions outlined above indicate that the development and implementation of continuous auditing will benefit the achievement of an organization's financial statement audit opinion. This aligns with the research by Luh Ketut Shanti Antik Safitri (2015), which found that the number of findings related to non-compliance with regulations significantly affects the audit opinion. In other words, the greater the number of findings regarding non-compliance with laws and regulations, the lower the probability of receiving an unqualified opinion.

By implementing continuous auditing, the organization can potentially reduce these findings, thus increasing the likelihood of receiving a positive audit opinion, such as an unqualified opinion. This reinforces the idea that continuous auditing not only enhances the efficiency of audits but also contributes to improved compliance and better financial reporting.

CONCLUSION

Measurement Results using the Internal Control Maturity Model: The development and implementation of continuous auditing at the Ministry of ABC was concluded to have achieved Level IV in five criteria: access and data acquisition, automated auditing, analysis methods, internal audit unit, audit objectives, and human resources. One criterion, audit and monitoring approach, was at Level III (structured analysis). Level IV indicates that internal controls have been institutionalized into continuous auditing, performing continuous tests and reporting on internal controls. The internal audit and management of the Ministry of ABC have successfully utilized continuous auditing. Internal audit has employed advanced analysis methods, established audit planning, and developed dashboards for visualizing data analysis results and trends.

Key Success Factors: The Ministry of ABC needs to focus on four key factors: human resources, technology, data, and organization. A combination of these factors will ensure the successful implementation of continuous auditing.

Benefits of Continuous Auditing: The implementation of continuous auditing has proven beneficial for internal audit in improving the efficiency and effectiveness of the audit process, as well as increasing compliance with budget execution at the Ministry.

Recommendations for Improving Continuous Auditing: To enhance the implementation of continuous auditing at the Ministry of ABC, the following steps should be taken: Continuously conduct tests and use comprehensive analysis methods with advanced tools, Ensure audit objectives include comprehensive verification of internal control quality, Implement an audit approach that provides alerts for errors or irregularities and allows for immediate follow-up, Grant unlimited access to data for enterprise-wide coverage.

Continuous Development of Key Success Factors: Internal audit at the Ministry of ABC should focus on four key success factors: human resources, technology systems, data access, and organizational structure. These factors must continuously be developed. **Human Resources:** Ongoing capacity building in knowledge and skills through continuous education and training. **Data Access:** Develop Application Programming Interfaces (APIs) for unlimited access to real-time data, ensuring data integrity. **Analysis Techniques:**

Continuously develop advanced analysis techniques to ensure comprehensive testing of the entire population.

Future Research: It is hoped that future research can focus on the implementation of continuous auditing across all ministries or agencies, with a broader scope and utilizing different frameworks. This would allow for the measurement of maturity levels on a national scale.

REFERENCES

- AAIPI. 2019. Kerangka Praktik Profesional Pengawasan Intern Pemerintah (KP3IP)
- Ames, Bradley C. Dkk. 2015. Global Technology Audit Guide: Coordinating Continuous Auditing and Monitoring to Provide Continuous Assurance
- Arief Nugroho, W., Insap Santosa, P., & Fauziati, S. (2019). Implementasi Continuous Auditing pada Badan Pemeriksa Keuangan sebagai Transformasi Digital di Era Revolusi Industri 4.0. In *Jurnal Good Governance* (Vol. 15, Issue 1).
- Badan Pengawasan Keuangan Pembangunan. 2018. Peraturan Kepala BPKP Nomor 2 Tahun 2018 tentang Grand Design Impelementasi Pengawasan Berkelanjutan
- Bumgarner, N. and Vasarhelyi, M.A. 2018, "Continuous Auditing—A New View1", Chan, D.Y., Chiu, V. and Vasarhelyi, M.A. (Ed.) *Continuous Auditing (Rutgers Studies in Accounting Analytics)*, Emerald Publishing Limited, Bingley, pp. 7-51
- Chan, D.Y. and Vasarhelyi, M.A. 2018, "Innovation and Practice of Continuous Auditing1", Chan, D.Y., Chiu, V. and Vasarhelyi, M.A. (Ed.) *Continuous Auditing (Rutgers Studies in Accounting Analytics)*, Emerald Publishing Limited, Bingley, pp. 271-283.
- Coderre, D. 2007. Recommendations for an Effective Continuous Audit Process. *Prodigy News Grup*, pp. 1- 4
- Coderre, D., & Police, R.C.M. 2005. *Global Technology Audit Guide: Continuous Auditing Implications for assurance, monitoring, and risk assessment*. The Institute of Internal Auditors
- Donald, R. Cooper dan Pamela, S. 2017. Schindler. *Business Research Methods Twelfth edition*. The McGraw-Hill/Irwin Series ISBN 978-0-07-352150-3
- Hennink, M., Hutter, I., & Bailey, A. (2011). *Qualitative Research Methods*. SAGE Publications Ltd.
- Hiererra S, & Sarayar, M. (2014). *Continuous_Audit_Implementasi_dan_Pengendalian_Ber*.
- IIA. (2016). *INTERNATIONAL STANDARDS FOR THE PROFESSIONAL PRACTICE OF INTERNAL AUDITING (STANDARDS)*. www.globaliia.org

- Jensen, M. C., Meckling, W. H., Benston, G., Canes, M., Henderson, D., Leffler, K., Long, J., Smith, C., Thompson, R., Watts, R., & Zimmerman, J. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. In *Journal of Financial Economics* (Issue 4). Harvard University Press.
<http://hupress.harvard.edu/catalog/JENTHF.html>
- Kahyaoglu.dkk. 2020. Continuous Auditing as a Strategic Tool in Public Sector Internal Audit: The Turkish Case. Conference: The 17th European Academic Conference on Internal Audit and Corporate Governance
- Kurniawan, Adi Taufan. 2017. Continuous Audit: Tantangan dalam Impelementasi. *Jurnal Akuntansi Dewantara*, 1(2), 47 -54
- KPMG. 2017. An Evolving Internal Audit Landscape: Beyond Conventional Compliance
- Mantelaers, Eric and Zoet, Martijn. 2018. Continuous Auditing: A Practical Maturity Model. *MCIS 2018 Proceedings*. 40
- Moeller, Robert R. 2016. *Brink's Modern Internal Auditing: A Common Body of Knowledge*. Edisi Kedelapan. Wiley Corporate F&A. Hoboken, New Jersey: Wiley.
- Orumwense Jones Osasuyi. 2017. Implementation of CA for the Public Sector in Nigeria. *Journal of Accounting, Business and Finance Research* ISSN: 2521-3830
- Saputro, Krestanto Aji. 2022. Analisis Adopsi Continuous Auditing Pada Kementerian/Lembaga Negara di Indonesia. Fakultas Ekonomika dan Bisnis Universitas Gajah Mada
- Scanella dan Polizzi. 2022. Continuous Auditing in Public Sector and Central Bank: Framework to tackle implementation challenges. *Journal of Financial Regulation and Compliance*. ISSN: 1358-1988
- Soedarsono, Slamet; Sri Mulyani, Hiro Tugiman, dan Suhardi, Didik. 2019. "Information Quality and Management Support as Key Factors in the Applications of Continuous Auditing and Continuous Monitoring: An Empirical Study in the Government Sector of Indonesia." *Contemporary Economics*, 13 (3): 335–350.
<https://doi.org/10.5709/ce.1897-9254.317>
- Prakoso dan Khudri. 2021. Adoption of CA in The Internal Audit Unit of SKK Migas Using TOE Framework. Universitas Indonesia
- Republik Indonesia. (2004). Undang – Undang Nomor 15 Tahun 2004 tentang Pengelolaan dan Tanggung Jawab Keuangan Negara
- Republik Indonesia. (2008). Peraturan Pmerintah Nomor 60 Tahun 2008 tentang Sistem Pengendalian Pemerintah
- Republik Indonesia. (2021). Peraturan Presiden Nomor 80 Tahun 2021 tentang Kementerian Perencanaan Pembangunan Nasional

- Republik Indonesia. (2021). Peraturan Presiden Nomor 81 Tahun 2021 tentang Badan Perencanaan Pembangunan Nasional
- Rezaee, Z., Sharbatoghlie, A., Elam, R. and McMickle, P.L. (2018), "Continuous Auditing: Building Automated Auditing Capability1", Chan, D.Y., Chiu, V. and Vasarhelyi, M.A. (Ed.) Continuous Auditing (Rutgers Studies in Accounting Analytics), Emerald Publishing Limited, Bingley, pp. 169-190.
- Sekaran, Uma, Bougie, Roger. (2016). Research Methods For Business: A Skill Building Approach (8th ed. (Asia Edition). Hoboken: Wiley.
- Vasarhelyi, M. A., Kuenkaikaew, S., Littley, J., & Katie Williams, K. (n.d.-a). Continuous Auditing technology adoption in leading internal audit organizations.
- Vasarhelyi, M. A., Kuenkaikaew, S., Littley, J., & Katie Williams, K. (n.d.-b). Continuous Auditing technology adoption in leading internal audit organizations
- Weigerinck, H.C.G. (2019). "Internal Continuous Auditing: How can the implementation of continuous auditing be facilitated, in order to improve the adaption of continuous auditing in practice?'. University Twente
- Widuri, R., O'Connell, B., & Yapa, P. W. S. (2016). Adopting generalized audit software: an Indonesian perspective. *Managerial Auditing Journal*, 31(8–9), 821–847. <https://doi.org/10.1108/MAJ-10-2015-1247>