

Improving Audit Quality: Adopting Technology and Risk Management

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This study aimed to explain the effect of computer-based audit techniques (CAATs) adoption and assessment of client's risk management on the audit quality conducted by auditors of the Supreme Audit Agency/Badan Pemeriksa Keuangan (BPK) in Indonesia. The primary data obtained from the survey were used to explain the purpose of this research. This research data was processed using the Structural Equation Modelling – Partial Least Square (SEM-PLS). This study found that audit quality provided by auditors has not been determined significantly by CAATs adoption and risk management. Adoption of CAATs by auditors has no significant effect on audit quality. However, client risk management shows a significant influence on audit quality.

Key words: *CAATs, Risk Management, Audit Quality*

Introduction

Audit quality was an issue that has been investigated in the past 20 decades (Knechel et al., 2013). This issue will be increasingly complex with the development of business and information technology. Technology development will have an impact on the audit process carried out by auditors (Zhao et al., 2004) such as the availability of related data and the use of computer-assisted audit techniques (CAATs). Auditors are eventually be required to improve their competencies. The aadoption and use of CAATs will be able to improve audit quality (Braun & Davis, 2003; Manson, McCartney, & Sherer, 2001) and finally improve the integrity of financial reporting (Widuri, 2014).

In the United States, after the Enron case, the use of CAATs in the audit process is a must (Debreceeny, Lee, Neo, & Toh, 2005; Widuri et al., 2016) as confirmed in the US Statement of Auditing Standards (SAS) No 316.52 which requires auditors to use TABK in collecting audit evidence especially in the form of electronic data (AICPA, 2002). However, in developing countries including Indonesia, the adoption and use of CAATs in the audit

process are still recommended (Ghani, Azizi, & Zabedah, 2016). This recommendation is stated in Audit Standards 300, 315 and 330 which require auditors to use TABK in planning audits, assessing risks and testing a broader audit. (IAPI, 2015a, 2015b, 2015c). Research on the use of CAATs by auditors in Indonesia is relatively limited. One of the researchers, Widuri (2014), found that the use of commercial software in the audit process were relatively limited, especially by the middle-small public accounting firm. Similar results were found in Malaysia (Ghani et al., 2016).

Adopting CAATs was also required in audit of state finances. Act No. 15/2004 is the regulatory milestone of state financial management reform in Indonesia which provides a full and independent mandate to the Supreme Audit Agency (BPK) to carry out checks on the management and responsibility of state finances. As a follow up to the mandate, BPK then set the State Financial Inspection Standards (SPKN) through BPK Regulation Number 1 of 2007. This regulation was issued after due process that involved stakeholders from the government (c.q. Minister of Finance), and related organizations and considered international standards. This SPKN is an operational guideline for BPK in carrying out inspections (Darono, 2014).

In the context of using technology, the SPKN regulates that BPK can collect audit evidence with a continuous auditing approach (continuous auditing) which is applied in e-Audit applications. The application was developed to respond to the development of the use of accounting information system technology by government agencies in the preparation of financial statements. This response aims to improve the quality of audits provided. In addition, based on the 2017 BPK Annual Report, it was reported that BPK has developed 4 (four) applications that are used to support the inspection task, namely (i) updating the e-Audit Portal application; (ii) the SIAP application that is used to assist in the management of confidential Examination Working Papers more efficiently and consistently; (ii) the Sistem Manajemen Pemeriksaan (SMP) application that provides information about the entire inspection process within the BPK-RI which starts from the planning, implementation, reporting, follow-up and evaluation of examination results; and (iv) the SIPTL application that complements the e-Audit application to check whether the recommendations issued by the BPK have been followed up (Badan Pemeriksa Keuangan, 2018).

However, based on Gidden, who introduced the structuration theory, explained that a technology as a social structure will not have a positive impact if it is not supported by an adequate (capability) of agent. In the context of the use of TABK by auditors, the effect of using CAATs on quality audits is highly dependent on (the ability) of the auditor to understand and operate them adequately. Research with a qualitative approach by Darono (2014) concluded that the use of e-Audit by BPK auditors was considered relatively successful in providing quality audits, although it requires continuous reinforcement and improvement in the future. Nevertheless, this research needs to be strengthened by an

empirical quantitative approach. This approach is intended to see the empirical impact of the use of e-Audit on the quality of audits provided.

In addition to internal auditor factors related to higher and more sophisticated competencies towards the use of CAATs and the implementation of risk-based audits, audit quality can also be influenced by regulator factors and the audit client itself. Factors related to audit clients that also affect audit quality are the implementation of risk management. Risk management carried out by management aims to ensure the company's risk which is in a position that can be tolerated, can be controlled and accepted, so as to avoid losses (Collier, 2009, p. 6). Risk management implemented by clients contributes to the reliability of financial reporting. According to FRC (2008), the effectiveness of financial reporting is one of the drivers that affects audit quality (Knechel et al., 2013, p. 388). The client's business risk will determine the level of auditor conservatism (Qi, Li, & Tian, 2015, p. 75), reputation and litigation risk auditors (Krishnan, Sun, Wang, & Yang, 2012, p. 147) that will determine the quality of audits to be achieved.

Literature Review

Structurization theory explains the concept of dualism in structure. Structure as a social practice is a means or medium and simultaneously as a result of the actions of agents or actors (Darono, 2014; Manson et al., 2001). For example the technology used by auditors is seen not only as a tool but also as a social practice. Technology as a social practice can be seen as an instrument used by actors / agents in carrying out production or reproduction of systems, such as the means used by auditors in conducting audit processes. In addition, technology itself can also be seen as a result of the actions done by the auditor himself.

In the context of the use of technology, the dualism of the structure also developed technological duality. In the duality of technology, the actor takes action to produce an application-technology, making it a work tool and responding to any impact arising from the use of the technology (Darono, 2014). Auditors who use a particular CAATs in the audit process, making CAATs as a tool or medium in conducting audits and responding to the results obtained from the use of the CAATs in improving audit quality.

Furthermore, information technology (IT) can have an impact on the organization in 2 (two) aspects. First, the introduction of IT will have a specific impact on the actions and behavior of individuals working in an organization. Second, IT can have an impact on the structure and processes of an organization (Manson et al., 2001).

In the context of the audit, research was conducted by Manson et al. (2001) on 33 auditors at different levels in 2 audit firms in the UK, with Giddens's structuration theory framework for

the use of audit automation. The structurization approach used is audit automation as culture, control and competition. The study found that a number of audit firm partners believe that the introduction of audit technology (CAATs) can improve the quality of audits performed. This is because the use of audit technology will change the structure of audit firm where partners will be more closely involved in the daily work of the audit team.

The effect of adopting Assisted Audit Techniques (CAATs) on Audit Quality

Technological developments demand changes in the audit profession. The manual audit approach is no longer considered compatible with the increasingly complex transactions and inherent risks. In response to this, regulators demanded auditors and audit firms to improve their competencies. Among them are the use of computer-assisted audit techniques (CAATs). This policy has been mandatory in many countries such as the United States. Whereas Indonesia gradually stepped up the audit firms and auditors to adopt CAATs as suggested in SPAP.

Several studies have provided information that the use of TABK is able to have a positive impact on the audit process (Ghani et al., 2016), providing consistency of testing and high audit quality (Haider, 2013) and maintaining audit quality (Willborn, 1989). Based on theories and previous researches, the hypothesis proposed is

H1₀ : There is no influence on the adoption of computer-assisted audit techniques (CAATs) on audit quality

The effect of Client Risk Management Implementation on Audit Quality

The IAASB issued a comprehensive audit quality framework in 2014. It was stated that audit quality is not only determined from the auditor's perspective such as input, process, output and outcome indicated by the auditor. In addition, interactions between parties such as management, those charged with governance (TCWG), stakeholders, regulators, and auditors are also considered to contribute to the achievement of audit quality. Risk management is a factor from a management perspective that contributes to audit quality.

Risk management is a management effort in managing risk so that it can still provide value to the organization. The complexity of an organization's transaction will trigger increasingly diverse risks. In the auditor context, this increased risk will affect the level of auditor conservatism (Qi et al., 2015), and determine the level of reputation and risk of auditor litigation (Krishnan et al., 2012) which will determine the audit quality. Based on the logic of the theory above, the hypothesis proposed is

H3₀ : There is no influence on the implementation of client risk management on audit quality

Data and Methodology

This study uses an associative approach that examines the effect of adoption of computer-assisted audit techniques (CAATs) and the assessment of client risk management on audit quality. Primary data is obtained through a questionnaire which as measured by a rating scale. The research model, indicators and questions in the questionnaire were developed based on theory and similar previous research. The questionnaire was distributed in Indonesia to fit the local context and the respondent. The data used in this study was obtained through field research from questionnaires distributed directly to respondents.

Respondents in this study were auditors of the Supreme Audit Agency (BPK) who served in the head office. There are 83 auditors taken as sample respondents. The number of respondents is a result of the calculation using Slovin formula for the auditor population assigned to the Head Office. While the sampling technique chosen was simple random sampling. The questionnaires that were collected and can be continued to be analysed were 84 auditors.

The following is a descriptive of the respondents in this study, as in the table below.

Row Labels	Age	%
> 35 years old	28	33%
20-24 years old	8	10%
25-29 years old	18	21%
30-34 years old	30	36%
Grand Total	84	

Row Labels	Work experience as an auditor	%
> 3 years	58	69%
1 year	6	7%
2 years	10	12%
3 years	10	12%
Grand Total	84	

Row Labels	Sex	%
Male	65	77%
Female	19	23%
Grand Total	84	

Row Labels	Number of auditor certifications owned	%
> 1 certifications	36	43%
1 certification	21	25%
None	27	32%

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Grand Total	84	
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Row Labels	Education	%
Diploma	3	4%
Postgraduate (S2/S3)	25	30%
Bachelor (S1)	56	67%
Grand Total	84	

Row Labels	Long time using audit software	%
< 1 year	14	17%
> 1 Years	65	77%
1 year	5	6%
Grand Total	84	

Row Labels	Position at the BPK	%
Senior Team Member	2	2%
Team Leader	2	2%
Senior Team Leader	1	1%
Junior Team Leader	1	1%
Auditor	66	79%
Junior Auditor	6	7%
First Auditor	6	7%
Grand Total	84	1

Row Labels	Types of Software Used	%
Ms Excel	67	45%
IDEA	4	3%
APPLAUD	4	3%
ACL	45	30%
Foucaudit	7	5%
Inhouse application	13	9%
Other	10	7%
Grand Total	150	

Row Labels	Special Skills Owned	%
Taxation	13	15%
Accounting	41	47%
Other	33	38%
Grand Total	87	

Based on the respondents' answers, it is known that an auditor can use more than 1 (one) audit software in his assignment. Microsoft Excel is the most dominant software used by auditors, namely by 67 auditors. Similar to expertise, an auditor can have more than 1 (one) special expertise.

The variables used in the study are the adoption of computer-assisted audit techniques (CAATs), the implementation of client risk management, and audit quality. Each of these

variables will be detailed in dimensions and indicators based on relevant references and previous research.

The following is a brief explanation of the variables, dimensions and indicators used.

Adoption of CAATs

Adoption of CAATs is the use of computer technology by auditors in carrying out the audit process. The dimensions and indicators that build the variable adoption of CAATs are:

a. Technology (TOE Framework)

Technology is a tool used to process information. In the context of CAATs adoption, technology is software and hardware used in the audit process. The dimensions and indicators that build variables are compatibility with the client and audit firm's existing IT platforms, equivalent and sufficient documentation to follow.

b. Organization (TOE Framework)

The organizational context in technology adoption is related to the characteristics and resources that are owned and run by organizations in adopting a technology. The organizational context in technology adoption can be seen from (1) Audit firm size which includes workloads on multiple audit engagement (2) Audit firm characteristics that include full support from top management, availability of IT audit expertise in organizations, demand in auditor promotion policies; and (3) resources that include effective and adequate internal and external training for staff.

c. Environment (TOE Framework)

The environmental context in technology adoption is the opportunity and challenge of technology adoption related to the company's response to industry competition, availability of technology providers and related regulations. The adoption of technology related to the context of the environment is the structure and level of industrial competition, availability of technology providers and related regulations.

Implementation of Risk Management (Clients)

Risk management is a systematic process carried out by all parties in the company to manage risk in achieving company goals. The risk management process is generally carried out in 4 (four) stages, namely (a) the risk identification process that fits the company's context; (b) risk assessment and measurement process; (c) risk treatment process or strategy; (d) the process of monitoring and reviewing risks. This process will be used as an indicator of risk management variables in this study.

Audit Quality

Audit quality is the auditor's ability to collect and provide judgment on audit evidence (competency) appropriately (in accordance with general acceptable GAAS auditing standards), detect and report material misstatements in the accounting system (independent). The audit quality is influenced by 3 main dimensions, namely competence, independence and relationships with clients. Competencies include the culture of audit firm, skills, and experience. Independence is related to independence and non-audit services. While relationships with clients include responsiveness, and knowledge of clients.

The analysis tool used to see the influence between these variables is Structural Equation Modelling (SEM) which is run through Smart PLS software according to the characteristics of the data obtained. SEM is used to describe the relationship between variables observed (Schumacker & Lomax, 2010, p. 3), both between latent variables and manifest variables and indicators in the measurement model (outer model), or latent variables with one another in the inner model, and measurement errors directly. Before conducting an analysis of a fit model, the validity test is done by looking at the loading factor. The limit of the value of validity taken is above 0.5. Indicators that have a small loading factor value of 0.5, will be discarded in the preparation of the model. While the reliability test uses the value of Cronbach Alpha (CA) and Composite Reliability (CR) (Wati, 2018).

Results and Discussion

Evaluation of the Measurement Model

Evaluation of the measurement model used in the study is an indicator of reliability, internal consistency, convergent validity and discriminant validity. The limit of the validity value used is 0.5 (Wati, 2018). This means that indicators that have a value of less than 0.5 are considered invalid. The invalid indicator will be discarded and then retested. Based on the measurement of the value of loading factors, of the 34 indicators tested there were 10 indicators which were worth less than 0.5. So, the 10 indicators are discarded. The second test found that 24 indicators were declared valid because they had a value greater than 0.5 and even had a value greater than 0.7.

As for reliability testing, the test was carried out with the values of Cronbach Alpha (CA), Composite Reliability (CR) and Average Variance Extracted (AVE). The value limit is used for CA and CR is 0.6 and the AVE value is greater than 0.5 (Wati, 2018). Based on reliability testing carried out as follows.

Variable	Cronbach Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Adoption of CAATs (x1)	0.943	0.942	0.645
Implementation of Risk Management (x2)	0.950	0.964	0.869
Audit Quality (y)	1.000	1.000	1.000

Based on the table above, it is concluded that the measurement model meets the requirements of reliability testing. This can be seen from the CA and CR values that are greater than 0.6 and the AVE values greater than 0.5.

Evaluation of Structural Models

For structural models, the tests carried out are the analysis of the value of determination and hypothesis testing. The goodness of fit of the structural model obtained based on the R-square value is 16.6%. This means that the audit quality is only able to be influenced by the adoption of CAATs and risk management of clients only by 16.6%. This influence is considered weak because audit quality in this study is more influenced by other variables, namely 83.4%.

Hypothesis testing is done by evaluating the t-value of each path coefficient. The t-table value for the two tail test and the 0.05 significance level are 1.98. The following is testing the hypothesis.

H	Path	Path	t-value	Conclusion
H1	Adoption of CAATs → Audit Quality	0.008	0.054	Not significant
H2	Risk Management → Audit Quality	-0.410	6.084	Significant

Testing of hypothesis 1 explains that the adoption of CAATs does not have a significant effect on audit quality. Testing hypothesis 2 has negative coefficient parameters. This explains the negative influence between risk management and audit quality. That is, the higher the risk of the client is marked by the ineffectiveness of risk management, the better the audit quality is indicated by the auditor. This influence has a significant value because the value of t-value is greater than the value of t-table.

Discussion

This study shows that the quality of audits provided by BPK auditors can only be influenced by TABK adoption and client risk management by 16.6%. But only client risk management has a significant influence. While the adoption of CAATs has no significant influence.

The independence is the only indicator of audit quality whose loading factor is more than 0.5. While indicators of auditor ability and relationship quality cannot be included in the test because the value of the loading factor is smaller than 0.5. Therefore, the small influence of CAATs adoption and risk management on audit quality as indicated by independence is understandable. This is due to the adoption of CAATs by auditors more related to audit quality related to competency. Adoption of CAATs is measured by technological, organizational and environmental factors. Technology factors are related to the auditor's ability to use CAATs sourced from individual auditors and CAATs features. While organizational factors are related to encouragement and incentives from audit firm to ensure auditors use CAATs. Finally, environmental factors are related to external factors that encourage auditors to use CAATs.

The types of CAATs used by auditors support the research findings. Based on the demographic data, it is known that the number of auditors who use excel reaches 45% compared to other software. In terms of the number of auditors, Ms Excel was used by 67 people from 84 respondents. This data shows that the audit process is still done manually. Based on the BPK annual report, it was stated that the BPK had developed e-Audit and other supporting applications. However, based on the type of CAATs, only 23 people used inhouse software and others. The inhouse software and others is assumed as e-Audit and supporting applications. This explains that BPK auditors have not used the inhouse software optimally, including e-Audit. This can explain the reason for the adoption of CAATs by BPK auditors does not have significant effect on audit quality.

The research findings are also supported by data that explain that auditors who use inhouse software as the first software choice are auditors with less than 1 year experience using the software, aged under 30 years old, their highest education is bachelor's degree, position as examiner, experience as a new auditor for 1 year and do not have special skills. This explains that inhouse software is widely used by junior auditors and more auditors still feel comfortable with Ms Excel. This is supported by data that Ms Excel users as the main software is 76% of auditors aged over 30 years including 38% are auditors aged over 35 years. Likewise in terms of experience, 76% of auditors who use Ms Excel are auditors with more than 3 years' experience and none has ever used inhouse software the main software in conducting audits.



This study has not been able to support qualitative research conducted by Darono (2014) on the use of e-Audit by BPK auditors. Adoption of e-Audit by auditors is relatively good even though it requires repairs and a longer period of use in the future. his study supports the conclusion of qualitative research conducted by Widuri (2016) who found that auditors in Indonesia were still low in using CAATs. This study does not support research which states that the use of CAATs has a positive impact on the audit process (Ghani et al., 2016), provide consistency of testing and high audit quality (Haider, 2013) and maintain audit quality (Willborn, 1989)

Confirmation to structuration theory explains that the role of an agent is needed to provide maximum results in certain social structures. The low use of CAATs other than Ms Excel by BPK auditors explains the reason for the insignificant influence on audit quality. Characteristics of inhouse application users as the main software choice is the duration of use less than 1 year, aged under 30 years with the highest education is a bachelor, position as examiner, experience as a new auditor 1 year and do not have special skills. This characteristic explains that the impact of the use of social structure in the form of CAATs adoption that has not been significant to audit quality, is also able to be explained by the not yet optimal role of agents. Appropriate technology will not have a good impact, if the user cannot operate it properly and according to the manual. The impact of these technologies does not always provide consistent results (DeSanctis & Poole, 1994).

The significant influence of risk management on audit quality can also be explained because client management risk assessment is relatively much related to maintaining the attitude of auditor independence in addition to the ability to assess risk management. The more auditors are able to maintain an attitude of independence, the more they are able to maintain prudence and professional awareness in assessing the level of implementation of client risk management. Client risks that are deemed ineffective by the auditor will spur the auditor to increase the attitude of conservatism. This attitude can be seen from the high professional scepticism and adjustment which is marked by the maximum audit procedures performed. The results will have an impact on the audit quality. This study supports a research that states that an increase in risk will influence the level of auditor conservatism (Qi et al., 2015).

This is also supported by data that explains 33% of auditors is over 35 years old, 67% auditors have more than 3 years' experience and 43% auditors have more than 1 certification. This characteristic explains that the majority of auditor respondents have high experience with high professional scepticism and adjustment. This high experience will be able to assist auditors in assessing client risk management well and being able to maintain good independence.

Conclusion

This study aims to see the effect of CAATs adoption and client risk management on audit quality. Structuration theory is used to explain the influence of these two concepts. It is found that audit quality provided by auditors has not been determined significantly by CAATs adoption and risk management. This is caused by the majority of auditors in this study who use Ms Excel more often. The use of inhouse applications from BPK such as e-Audit has not been used optimally. Its use is mostly carried out by junior auditors. In addition, the absence of such influence is also caused by audit quality indicators which are only represented by independence. The use of CAATs is more related to auditor competencies rather than auditor independence. While the significant influence of risk management is indeed related to independence. The low risk management of clients causes auditors to be more conservative. Professional scepticism will be seen from the increasing of auditor independence which is an indicator of audit quality in this study.

The limitations of this study, which leave an independence indicator for auditor quality due to testing validity and reliability, have made the results unable to show comprehensive results. Subsequent research is expected to maintain audit quality with complete indicators of competence, independence and auditor-client relations through larger respondents and more than one model accuracy.

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