Jurnal Akuntansi dan Auditing Indonesia
https://journal.uii.ac.id/JAAI

Does audit quality mediate the effect of information technology and competence on internal audit effectiveness?

Miryam P. Lonto[1*], Aditya Pandowo[2]
[1]Department of Accounting, Universitas Negeri Manado, Manado, Indonesia
[2]Department of Management, Universitas Negeri Manado, Manado, Indonesia
[*]Corresponding author email: miryamlontoh@unima.ac.id

ARTICLE INFO

Article history:
Received 2025-02-11
Accepted 2025-06-20
Published 2025-06-25

Keywords:
Internal audit effectiveness, information technology, competence, audit quality

DOI:
https://doi.org/10.20885/jaai.vol29.iss1.art3

ABSTRACT

The effectiveness of the internal audit function plays a vital role in the government system's detection of all fraud risks in an organization. Therefore, this study aims to examine the effects of information technology, competence and professional proficiency on the effectiveness of internal audits, with internal audit quality as a mediator. This study applies a quantitative approach involving a survey of the internal auditors of the Inspectorates of Greater North Sulawesi, the Financial and Development Supervisory Agency, and a census sampling technique. The results of the study show that the use of information technology increases the effectiveness of internal audits, and the higher audit quality resulting from auditor competence increases the effectiveness of internal audits. This study supports institutional theory, provides implications for regional inspectorates to maintain audit quality in performing their respective tasks, and strongly encourages the use of E-Audit applications for early fraud detection in local governments.

Introduction

Internal auditors play an important role in government systems. The effectiveness of the internal audit function helps detect potential fraud risks within an organization (Nwabuisi & Israel, 2021; Reskia & Sofie, 2022). This includes fraud in preparation of financial statements (Mulyani et al., 2019) and administrative corruption (Asiedu & Deffor, 2017).

The ineffectiveness of the Government Internal Supervisory Apparatus (APIP), including internal auditors, refers to the APIP capability achievement data for the second quarter of 2023 (BPKP, 2023), revealing that only eight regencies/cities achieve Level 3, leaving seven others still at Level 2. The Internal Audit Capability Model (IA-CM), a framework identifying the fundamental aspects required for effective internal supervision in government, states that, at level 2, APIP is able to guarantee the governance process in accordance with regulations and detect corruption; at level 3, APIP is able to assess the efficiency, effectiveness, and economy of an activity and provide consultation on governance, risk management, and internal control (BPKP, 2023; Renwas, 2018).

Internal supervision for realizing a clean government has not been maximized, as judged from corruption cases in the last few years in the regencies/cities in North Sulawesi, taking the case of misappropriation of APBD funds, especially the allocation of funds for the media, reaching billions of rupiah, between 2021-2023 at the Tomohon City Communication and Information Service (Diskominfo) (Marcel, 2023). This also includes corruption and money laundering cases of funds for handling the Covid-19 pandemic in North Minahasa in the 2020 Fiscal Year, alleged corruption cases in road rehabilitation in Bolaang Mongondow Regency in the 2020 Fiscal Year, alleged corruption cases in the procurement of village mapping in Sitaro Islands Regency in the 2019 Fiscal Year, alleged corruption cases in the procurement of garlic seeds in South Minahasa Regency in the 2019 Fiscal Year, and alleged corruption cases in drinking water grants in Bitung City in the 2018 Fiscal Year (Umar, 2022). The ineffectiveness of the APIP and the existence of corruption cases in North Sulawesi underlie the research on the effectiveness of internal audits in North Sulawesi Province.

Previous studies have proven the direct effect of information technology, professional competence and skills, and audit quality on internal audit effectiveness (Cohen & Sayag, 2010; Endaya & Hanefah, 2016 Sutaryo, 2018; Tackie et al., 2016; Yadnyana, 2009;Alkebsi & Aziz, 2017). The direct relationship between information technology and professional skills on internal audit quality has also been proven by previous empirical studies (Abbott et al., 2016; Bierstaker et al., 2001; Pizzini et al., 2012; Prawitt et al., 2012). To the best of our knowledge,

P ISSN 1410-2420 | E ISSN 2528-6528

no prior study has tested the relationship between information technology and internal audit effectiveness, mediated by internal audit quality, making this study novel. The mediation relationship is important to study because the use of information technology in audits, such as E-Audit applications, will facilitate and shorten the time required to carry out the audit process, starting from planning to providing recommendations, so that internal audit work can be of high quality. Internal auditors who perform quality work are able to carry out their roles effectively as assurance providers and consultants, especially in fraud detection and prevention. This study aims to provide empirical evidence of the effect of information technology, professional competence, and skills on internal audit effectiveness mediated by audit quality.

This study applies the institutional theory (DiMaggio & Powell, 1983). Institutional theory suggests that changes in corporate structure and behavior are due to the need for legitimacy (Meyer & Rowan, 1977). Effectiveness is one way to be perceived as legitimate by key stakeholders (Lenz et al., 2018) to strengthen legitimacy and provide evidence of added value to the organization. This causes the organization to carry out a change process, which DiMaggio and Powell (1983) recognize as institutional isomorphism.

The concept of isomorphism proposed by DiMaggio and Powell (1983) consists of three things: coercive, mimetic, and normative. Coercive isomorphism refers to the process by which organizations adopt certain features (traits) because of coercion by the state, other organizations, or society. Coercive isomorphism occurs as a consequence of an organization's attempt to gain legitimacy. Mimetic isomorphism occurs when organizations imitate others because of uncertainty. Normative isomorphism occurs because of the recognition of professional organizations, and organizations focus on the norms and values inherent in professionalism.

Mimetic pressure is the basis for the internal audit function of local governments to use Information Technology (IT), as has been used by external government auditors, internal auditors in private organizations, or internal auditors at the ministry level. The use of IT is an adaptation of the technological advances and demands from the industrial era 5.0 in Indonesia. Therefore, IT was used as an independent variable in this study.

The coercive and normative pressures that drive the internal audit function to realize its effectiveness are increasing professionalism and compliance with the norms of professional behavior regulated by standards. This is in line with one of the concepts of internal audit effectiveness proposed by White (1976), namely, that the effectiveness of internal audits is determined by the conformity between the audit and several universal standards extrapolated from the characteristics of internal audits. This is what underlies the researcher choosing the variables of competence, professional proficiency, and the quality of audit work, which are part of the basic principles, general standards, and standards of internal audit implementation regulated in the Indonesian Government Internal Audit Standards (*Standar Audit Intern Pemerintah Indonesia* (SAIPI)) and Government Internal Supervisory Apparatus Audit Standards (*Standar Audit Aparat Pengawasan Intern Pemerintah* (SA-APIP)).

This study also modifies institutional theory by incorporating quality theory (Teas, 1994). Teas (1994) proved that there are three main criteria for assessing service quality: First, outcome-related criteria, namely service users, realize that service providers have the professionalism and skills needed to solve problems. Second, process-related criteria, namely, service users, understand that service providers have the attitude and behavior needed to solve problems. Third, reputation/image-related criteria, namely, service users' belief that service providers have a good reputation, so they can be trusted and provide value in accordance with their sacrifices.

This study focuses on the first criterion. If quality theory is related to audit quality, it can be stated that an audit is of quality if the auditing process is carried out by auditors with high skills, such as competence and mastery of information technology, which are the variables in this study. Audit quality, based on DeAngelo (1981), reveals that an audit is said to be of quality if the auditor can properly find violations in the client's accounting system and properly report these findings. It can be said that this understanding points to the abilities that auditors must have, such as competence and the use of technology to find errors and fraud.

Literature Review

Information Technology and Internal Audit Effectiveness

The mimetic pressure of institutional theory serves as the basis for local governments' internal audit functions to use information technology. Mimetic pressure encourages the use of information technology by government internal auditors, as implemented by external government auditors, internal auditors in private organizations, or internal auditors at the ministry level.

Previous studies suggest that information technology plays an important role in internal audit functions, especially in the planning, testing, and reporting stages. Satava et al. (2006) reported that the relationship between internal audits and related information technology is important for effective task performance. Lin et al., (2006) found that the evolution of audits and the rapid development of technology openly contribute to audits. Furthermore, information technology systems can foster the reputation, reliability, and prestige of internal audit functions in the company (Pedrosa & Costa, 2012). Studies conducted by Alkebsi and Aziz (2017), Ayassrah et al. (2023), and Ramazanova and Nurgaliyeva (2023) on private companies in Yemen, Kazakhstan, and Jordan found that the use of

information technology affects the effectiveness of internal audits. Their research proves that information technology systems have a significant impact on auditor activities because access to organizational data can be obtained anywhere and at any time, which increases the efficiency and effectiveness of internal auditing procedures.

The pressure to follow audit procedures that use technology, as carried out by other auditors, such as auditors in private organizations, and the benefits of using information technology itself cause internal auditors to use information technology in carrying out their duties. The research hypotheses are summarized as follows:
H_1: Information technology has a positive effect on the effectiveness of internal audits.

Competence and Professional Proficiency, and Internal Audit Effectiveness

Institutional theory emphasizes the importance of legitimacy (Meyer & Rowan, 1977), because it drives the internal audit function to realize its functional effectiveness (Lenz et al., 2018). This causes organizations to implement compliance processes through pressure arising from the institutional environment. Pressure/coercive power requires an internal audit function to comply with regulations set by regulators or the government. Normative power requires internal audits to develop professional identity through institutionalized practices. From this perspective, internal audits must comply with the Audit Standards of the Government Internal Supervisory Apparatus (APIP) regulated in Permen-PAN 05 of 2008 and the Indonesian Government Internal Audit Standards prepared by the Association of Government Internal Auditors (AAIP), a professional organization of government internal auditors in Indonesia. Competence and professional skills are regulated by both the audit standards.

Based on the interpretation of international standards for internal auditing, professional skills/expertise refers to the knowledge, skills, and other competencies required by internal auditors to effectively perform their tasks (Standar Internasional Praktik Profesional Audit Internal, 2016). When they have knowledge, experience, and professional qualifications that meet the standards, internal auditors are qualified to evaluate and manage fraud risks to achieve the effectiveness of the internal audit function in detecting and preventing fraud.

Several studies have found that the professional qualifications of internal auditors in a department, determined by participation in professional training and development programs, educational background, experience, professional qualifications, and professional membership, have a positive effect on the effectiveness of this department (Al-Twaijry et al., 2003; Endaya & Hanefah, 2016; Lenz et al., 2014). Furthermore, internal auditors' competence positively affects the effectiveness of their internal audit functions (Alzeban & Gwilliam, 2014; Shohihah et al., 2018).

Based on the institutional theory, coercive pressure requires an internal audit function to comply with the standards established by regulators. International internal audit standards' professional competence refers to the knowledge, skills, and other competencies required by internal auditors to effectively carry out their responsibilities. Previous studies have demonstrated the relationship between competence, professional proficiency, and internal audit effectiveness. The research hypotheses are summarized as follows:
H_2: Competence and professional proficiency have positive effects on the effectiveness of internal audits.

Audit Quality and Internal Audit Effectiveness

Institutional theory (DiMaggio & Powell, 1983) states that organizational changes as a result of compliance with regulation (coercive) set by the government and compliance with professional regulation (normative) require the internal audit function to execute its assignments in accordance with the standards set by both the government (APIP Audit Standards) and the government internal auditor professional organization (SAIPI). When carrying out assignments according to standards, internal auditors can make effective plans, find material errors, and communicate effectively on the recommendations they develop, suggesting that the audit work is of high quality. Internal auditors who perform quality work can play their roles effectively as providers of assurance and consultants, and especially as detectors and deterrents of fraud.

Previous research has revealed that the internal audit department's ability to provide useful findings and recommendations and execute its tasks according to standards is important for audit effectiveness. Bou-Raad (2000) states that the scope of an auditor's duties includes evaluating areas that require a high level of judgment and audit reports that have a direct impact on decisions or actions taken by management. Furthermore, Glazer and Jaenike (1980) they argue that conducting audit work in accordance with internal audit standards significantly contributes to audit effectiveness.

Sawyer (1995) states that internal audits must prove their value and reputation in the organization. Internal audits must evaluate their performance and continuously improve their service (Ziegenfuss, 2000). Therefore, to obtain high-quality work, internal auditors must have expert staff, take work coverage in accordance with standards, have effective audit planning, plan effectively, assign supervision or quality review, and communicate effectively (Mihret & Yismaw, 2007).

Mihret and Yismaw (2007), through a case study conducted at educational institutions in Ethiopia, found two factors that most affect the effectiveness of internal audits: the quality of internal audit and management

support. (Cohen & Sayag, 2010Tackie et al., 2016Badara & Saidin, 2013; Turetken et al., 2020) Empirical and literature studies prove that there is a positive relationship between the quality of audit work and internal audit effectiveness.

Based on institutional theory, the encouragement to carry out audit work by applicable standards will make auditors carry out each stage of the audit to a high quality so that internal audit effectiveness will be realized. The research hypotheses are summarized as follows:

H_3: Audit quality has a positive effect on the effectiveness of internal audits.

Information Technology, Audit Quality, and Internal Audit Effectiveness

The skills of service providers are one of the bases for assessing whether the services provided are of good quality, as stated by Teas (1994) in the theory of quality. When associated with the internal audit function, information technology mastery is one of the skills that internal auditors must be able to improve their quality. As in the current Big Data era, it optimizes the audit process, starting from planning to providing recommendations to produce a good-quality internal audit.

Sawyer (1995) states that internal audits must demonstrate their value and reputation in the organization. Internal audits must evaluate their performance and continue to improve their service (Ziegenfuss, 2000). As such, it is in accordance with institutional theory (coercive pressure) stating that in order to gain legitimacy, the organization will increase professionalism and comply with professional behavioral norms regulated by standards, and have an impact on improving performance (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Zucker, 1987).

The direct relationship between information technology and audit quality has been studied by previous researchers, who have found a positive effect of information technology on internal audit quality. Internal auditors can perform their duties with higher quality through the use of information technology in different aspects such as planning, internal control, and reporting. Software packages, extensive electronic sheets, and other programs such as planning software provide room for internal audit operations to improve (Deribe & Regasa, 2014; Salehi & Husini, 2011). Good quality audit work can improve the effectiveness of internal audits (Mihret & Yismaw, 2007; Tackie et al., 2016). Good audit quality can help internal auditors improve their effectiveness in preventing fraud, and ensure that audit governance is properly implemented in accordance with regulations. The research hypotheses are summarized as follows:

H_4: Audit quality mediates the effect of information technology on internal audit effectiveness.

Competence and Professional Proficiency, Audit Quality and Internal Audit Effectiveness

Based on the Quality Theory, one of the criteria for assessing service quality is that the service provider has the professionalism and skills needed to solve problems (Teas, 1994). In the context of internal audits, DeAngelo (1981) shares a similar finding that a quality audit is assessed based on the auditor's ability to find and report material misstatements in the client's financial statements.

Previous researchers argue that conducting audit work in accordance with internal audit standards contributes significantly to audit effectiveness (Glazer & Jaenike, 1980) and provides added value to internal audits(Ridley & D'Silva, 1997), supporting institutional theory (coercive pressure), which states that to gain legitimacy, organizations will increase professionalism and comply with professional behavioral norms regulated by standards and have an impact on improving performance (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Zucker, 1987). In this study, performance refers to the effectiveness of the internal audit functions.

Research examining the direct relationship between competence and professional proficiency has been conducted in the private sector. For instance, Deribe and Regasa (2014), through a survey of commercial banks in Ethiopia, found that competence, along with performance and information technology, positively influences audit quality. Gul et al. (2013) conducted an archival study of Chinese companies. They find that individual auditors affect audit quality based on their characteristics (educational background, work experience in an audit firm, and political affiliation). Furthermore, Cohen and Sayag (2010) and Tackie e*t al.* (2016) find that high-quality audit work can enhance the effectiveness of internal audits. Therefore, the following research hypothesis is proposed:

H_5: Audit quality mediates the effects of competence and professional proficiency on internal audit effectiveness.

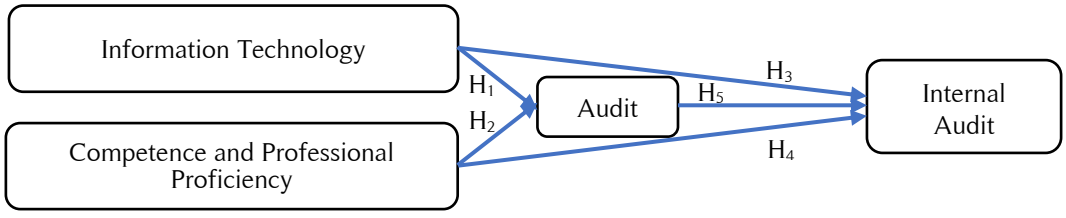

Figure 1. Research Model

Research Method

A quantitative approach is adopted in this study. This study was conducted with internal auditors in North Sulawesi. The respondent criteria were as follows: Government Internal Supervisory Apparatus (APIP) consisting of inspectorate auditors in North Sulawesi province and auditors of the North Sulawesi representative of the Financial and Development Supervisory Agency (BPKP), active in duty or not on leave, or inactive for other reasons. The same criteria were used in the previous studies by Kantohe et al. (2021), Lonto et al. (2023), and Saputra (2015). The APIP was chosen as the respondent because it is the executor of duties as an internal auditor in the local government. The population comprised 222 Inspectorate auditors and 41 BPKP auditors (BPKP, 2023). The sample used in this study included the entire population. The census method used for data collection was the entire population.

Data collection techniques with questionnaires were provided directly to inspectorate auditors who can be reached by researchers, for example, in Manado City, Tomohon, Bitung, Minahasa Regency, and South Minahasa. For areas that are difficult to reach due to long distances or because the location must cross the island, such as the Sangihe Islands Regency, Talaud Regency, and Siau Tagulandang Biaro Regency, data collection used the Google Form application. The questionnaire provided to inspectorate auditors used a Likert scale to measure the variables in this study.

The following are the operational definitions of the respective variables:

Information technology involves the use of all automated audit tools, both computers and software/applications, helping internal auditors execute their tasks efficiently through the indicators of (1) use of IT, (2) usefulness of IT, (3) ease of learning and operating Microsoft Excel, and (4) special skills to operate E-Audit (Lonto, 2022).

Professional competence and proficiency are auditors' capacities to implement their functions as supervisors and consultants and to detect and prevent fraud. Professional competence and proficiency, as defined by several researchers (Al-Twaijry et al., 2003; Cohen & Sayag, 2010; Endaya & Hanefah, 2016; Lenz et al., 2014; Tackie et al., 2016), and APIP audit standards (Menteri Negara Pendayagunaan Aparatur Negara, 2008) and SAIPI standards (Asosiasi Auditor Intern Pemerintah Indonesia, 2013), including five indicators: (1) knowledge, (2) experience, (3) training and development, (4) professional qualifications, and (5) professional membership.

Audit quality refers to the ability of internal auditors to produce useful recommendations for auditees. Research indicators by Mihret and Yismaw (2017), Cohen and Sayag (2010), Sila (2016), Tackie et al. (2016), APIP audit standards, (Menteri Negara Pendayagunaan Aparatur Negara, 2008) and SAIPI standards (Asosiasi Auditor Intern Pemerintah Indonesia, 2013). The indicators of this variable include (1) coverage of the audited area, (2) effective audit planning, (3) conducting inspections and supervision in accordance with applicable standards, (4) conducting effective communication, and (5) audit recommendations useful for management/local government decision making.

The effectiveness of internal audits represents the success of the internal audit function in assisting government agencies in achieving their goals properly, in accordance with applicable standards, and in preventing fraud in the organization. This variable includes the following indicators: (1) risk-based internal audit, (2) fraud control plan, (3) real-time audit, and (4) internal control system. (Lonto, 2022).

The data collected through the survey were analyzed quantitatively using partial least squares (PLS), a variant-based structural equation analysis (SEM) that can simultaneously test the measurement and structural models. The Smart PLS was used to measure the outer and inner models. The outer model tests convergent and discriminant validity, reliability, R-squared, and F-squared values. The inner model measures bootstrapping to test the hypothesis. The test included the measurement of the mediation hypothesis.

Results and Discussion

The processed data included 168 responses to the questionnaire. A research-instrument test was conducted to obtain a valid and reliable questionnaire. The validity test with construct validity determines how well the results obtained from a measure are in accordance with the theories used to define a construct. The reliability test presents the accuracy, consistency, and precision of the measuring instrument used to make the measurements. The reliability test utilized Cronbach's alpha parameters > 0.6. Table 1 presents the results of the validity and reliability tests.

Based on Table 1, the factor loading values of the construct measurement parameters were valid. Convergent validity using factor-loading parameters resulted in a value greater than 0.7 (Hair et al., 2019). The loading factor value of IAE4 was the lowest compared to the other indicators (0.723). In the IAE4 indicator, the internal auditor evaluates the implementation of the audit Fraud Control Plan (FCP). The FCP program has not been implemented by most Regional Apparatus Organizations (*Organisasi Perangkat Daerah* (OPD)) audited by the inspectorate, so the research subject (inspectorate) rated it low for indicator IAE4.

Table 1. The Results of the Convergent Validity Test

Variable	Indicator	Loading Factor
Internal Audit Effectiveness	IAE1	0.918
	IAE2	0.856
	IAE3	0.902
	IAE4	0.723
	IAE5	0.896
Audit Quality	AQ1	0.763
	AQ2	0.792
	AQ3	0.829
	AQ4	0.825
Competence and Professional Proficiency	C1	0.878
	C2	0.843
	C3	0.759
Information Technology	IT1	0.723
	IT2	0.794
	IT3	0.816
	IT4	0.816
	IT5	0.793
	IT6	0.750

Source: Processed Data

Table 2. Discriminant Validity

	Audit Quality	Competence	Information Technology	Internal Audit Effectiveness
Audit Quality	0.803			
Competence and Professional Proficiency	0.447	0.828		
Information Technology	0.601	0.338	0.783	
Internal Audit Effectiveness	0.312	0.210	0.250	0.862

Source: Processed Data

Based on Table 2, the value of discriminant validity testing with the Fornell-Larcker method was obtained, where the construct value was greater than the correlation value between constructs. Thus, all constructs were eligible for the next calculation process.

Table 3. Reliability Test

	Cronbach's alpha	Composite reliability	AVE
Audit Quality	0.816	0.817	0.644
Competence and Professional Proficiency	0.769	0.768	0.686
Information Technology	0.874	0.877	0.613
Internal Audit Effectiveness	0.915	0.957	0.743

Source: Processed Data

Based on Table 3, the reliability test uses three methods: Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE), in which the rule of thumb of Cronbach's alpha or composite reliability value must be greater than 0.7, and the AVE value must be more than 0.5 (Hair et al., 2019).

Table 4. R-Square Value, F-Effects, and Predictive Relevance

	R-square	F-Square		Q-Square		
		Audit Quality	Internal Audit Effectiveness	SSO	SSE	Q^2 (=1-SSE/SSO)
Audit Quality	0.429		0.032	672.000	404.436	0.398
Internal Audit Effectiveness	0.108			840.000	323.835	0.358
Information Technology		0.401	0.006	1008.000	553.779	0.451
Competence and Professional Proficiency		0.118	0.006	504.000	323.835	0.614

Source: Processed Data

Based on Table 4, the R-Square value of audit quality is 0.429, implying that audit quality is contributed by 42.9% of technology, competence, and professional skills, and 57.1% of other variables are not discussed in this study. The R-squared value of internal audit effectiveness of 0.108 indicates that internal audit effectiveness is contributed by 10.8% of technology, competence, professional skills, and audit quality, and 89.2% of other variables are not discussed in this study. Other factors that affect internal audit effectiveness include top management support (Ayassrah et al., 2023; Ta & Doan, 2022), auditor independence (Alqudah et al., 2023; Ta & Doan, 2022), external audit cooperation, internal audit department size, and extrinsic rewards (Alqudah et al., 2023).

The F Square value describes the exogenous construct that explains endogenous variables. In this study, the audit quality construct can be explained by information technology (0.401) and competence (0.118). Thus, information can explain large variances, while competence can explain small-scale variances. Internal audit effectiveness variables can be explained by audit quality (0.032), information technology (0.006), and competence (0.006). Thus, these three constructs can be explained on a small scale.

The Q-square value for all parameters is > 0; thus, it can be concluded that there is predictive relevance.

Table 5. The Results of Direct Effect Test

	T-statistics (|O/STDEV|)	P values	Result
Information Technology → Internal Audit Effectiveness	2.358	0.018	H_1 Supported
Competence and Professional Proficiency →Internal Audit Effectiveness	1.429	0.153	H_2 Not Supported
Audit Quality → Internal Audit Effectiveness	2.188	0.029	H_3 Supported

Source: Processed Data

As shown in Table 5, Information Technology has a direct effect on the effectiveness of internal audits (t = 2.358, p = 0.018); thus, Hypothesis 1 is supported. Competence and professional skills do not have a direct effect on the effectiveness of internal audits (t = 1.429, p = 0.153); thus, Hypothesis 2 is not supported. Thus, audit quality has an effect on the effectiveness of an internal audit (t = 2.188, p = 0.029); thus, Hypothesis 3 is supported.

Table 6. The Results of the Indirect Effect Test

	Original sample (O)	T statistics (|O/STDEV|)	P values	Result
Information Technology → Audit Quality → Internal Audit Effectiveness	0.113	1.848	0.065	H_4 Not Supported
Competence and Professional Proficiency → Audit Quality → Internal Audit Effectiveness	0.061	2.174	0.030	H_5 Supported

Source: Processed Data

Based on Table 6, audit quality does not mediate the effect of information technology on the effectiveness of internal audits, as the P-value indicates 0.065 > 0.05; thus, Hypothesis 4 is not supported. Audit quality mediates the effect of competence and professional skills on the effectiveness of internal audits; thus, hypothesis 5 is supported. The research result model is shown in Figure 2. Mediation testing can still be performed even if the direct relationship between the two variables (dependent and independent) is not significant (MacKinnon et al., 2007).

The test results provide empirical evidence that supports Hypothesis 1, meaning that the higher the internal auditor's information technology, the higher the effectiveness of internal audits in preventing fraud. These results are consistent with the empirical evidence obtained by Alkebsi and Aziz (2017); Ayassrah et al. (2023); Halbouni et al. (2016).

Alkebsi and Aziz (2017) provide empirical evidence through a survey of private companies in Yemen that the use of information technology affects the effectiveness of internal audits. The same thing is stated by Halbouni et al. (2016) conducted a study on financial accountants and practitioners (internal and external auditors) working in the United Arab Emirates and found that internal auditors have a positive perception of the role of information technology in preventing and detecting fraud and the need for moderate use of technological techniques by auditors to prevent future economic crimes. In accordance with this study, Ayassrah et al. (2023) research conducted on 172 auditors in Jordan shows that information technology, as seen from the quality of the system and the quality of the user, has a beneficial impact on the effectiveness of internal audits in the companies where the auditors work.

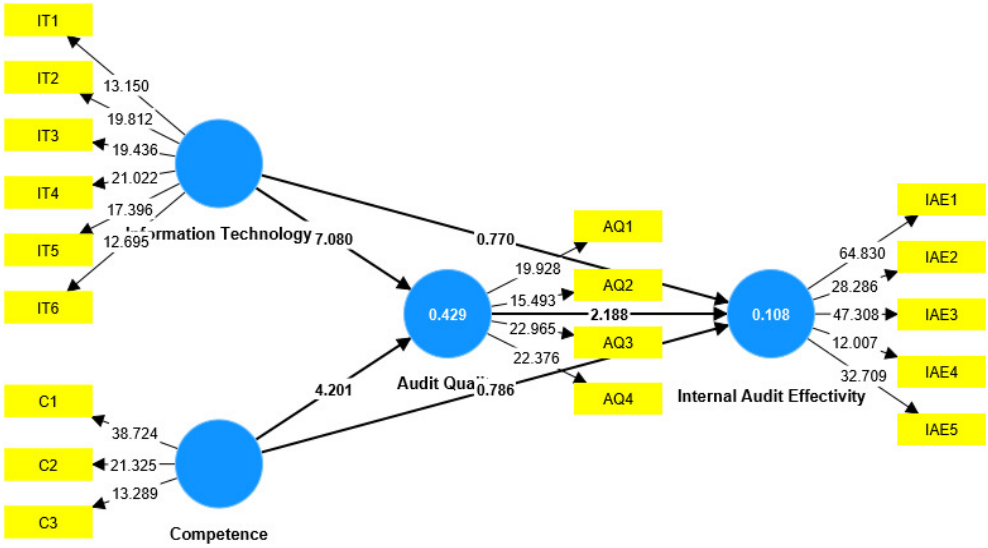

Figure 2. Research Final Mode

The findings of this study on the effects of information technology and internal audit effectiveness support institutional theory, as proposed by DiMaggio and Powell (1983). Mimetic pressure, as part of institutional theory, encourages the use of information technology by government internal auditors, as used by government external auditors and internal auditors in the private sector. Furthermore, normative pressure requires internal auditors to comply with the applicable audit standards in Indonesia's SAIPI (2020) and SAIPI (3230) regarding the use of technology in audit assignments.

The empirical evidence of this study suggests that the use of information technology in government internal audit standards requires internal auditors to use software or applications in auditing, such as Microsoft Excel, E-Audit PBJ, and SISWAKEUDES, for easier and time-saving auditing tasks, owing to mobile accessibility during the audit assignment. The E-Audit application for the PBJ is a probity audit or a continuous auditing tool. Probity audits help auditors focus on two aspects: compliance with procedures and real-time audit processes/systems executed only on procurement activities of goods and services considered to have high fraud risk. When there is a discrepancy in the procurement process of goods and services, it can be identified immediately. Thus, information technology can increase the effectiveness of internal audit functions in preventing fraud.

The test results provide empirical evidence that does not support Hypothesis 2. This finding implies that competence and professional proficiency do not influence the effectiveness of internal audits in preventing fraud. This empirical evidence is consistent with studies conducted by Cohen and Sayag (2010), Arena and Azzone (2009), and Mahmudah and Riyanto (2017). Cohen and Sayag (2010) conducted a survey study in Israel and found that professional skills do not affect the effectiveness of internal audits, as they depend more on the characteristics of the organization than on the qualifications and work settings of internal audit staff. Arena and Azzone (2009) conducted a study on Chief Audit Executives (CAEs) in 153 of the largest companies in Italy and found similar results. According to Arena and Azzone (2009), changes in the role of internal auditors have led to the creation of new skills to conduct activities that are closely related to risk management and corporate governance. Research conducted Mahmudah and Riyanto (2017) in the context of government internal auditors involving 39 Regional Inspectorates from six Provinces in Indonesia also found that professional skills do not affect the effectiveness of internal audits.

The importance of information technology in realizing internal audit effectiveness requires regional government support to provide E-Audit and SISWAKEUDES applications for regional inspectorates. Furthermore, it is necessary to conduct training in the use of these applications.

The empirical evidence that does not support Hypothesis 2 in the current study is supposedly due to the 74% non-accounting educational background of respondents. To prevent fraud, auditors must be able to perform risk-based internal audits (AIBR), probity audits, and fraud control plans (FCP). To understand and execute these fraud prevention procedures, auditors with an accounting educational background are required to possess professional competence and skills because they must understand and have expertise in auditing business risks, risk management, fraud risks and their controls, and probity audits. Therefore, the regional government recruiting employees in the Inspectorate should increase the number of employees with an accounting education background, which has basic knowledge of audits. Furthermore, it is necessary to conduct socialization and training on the AIBR Program, Probity Audit, and FCP for all internal auditors in North Sulawesi.

The test results provide empirical evidence to support Hypothesis 3, as indicated by a positive coefficient. This finding suggests that higher audit quality is associated with greater effectiveness of internal audits in

preventing fraud. This empirical evidence is consistent with those of previous studies (Cohen & Sayag, 2010; Rudhani et al., 2017; Tackie et al., 2016).

Cohen and Sayag (2010) conducted a survey on public and private sector organizations in Israel and found that the quality of audit work has a positive and significant relationship with two of the three dimensions of internal audit effectiveness. The implication is that the greater the quality of the audit work, the greater the auditing quality and auditees' evaluation (dimensions of internal audit effectiveness).

Tackie et al. (2016) tested the effect of audit quality on internal audit effectiveness among local government auditors in Ghana. The results show that audit quality has a positive and significant effect on internal audit effectiveness, resulting from compliance with international audit standards and the local audit laws of local government internal auditors.

The results of the empirical analysis of Rudhani et al. (2017) the public sector in Kosovo show that audit quality has a positive correlation with internal audit effectiveness. Audit quality is a fundamental element of internal audit effectiveness as it is one of the most influential factors.

The results of this study support institutional theory (DiMaggio & Powell, 1983), suggesting that coercive pressure (government regulations) and normative pressure (professional rules) underlie the function of internal auditors in realizing their effectiveness, that is, by complying with the norms of professional behavior set by standards. As such, when the internal auditor can execute his/her assignment according to applicable standards, or in other words, when his/her audit work is of high quality, he/she will be able to perform his/her role effectively as a provider of assurance and consultant to prevent fraud. When the internal auditor executes their assignment according to standards, they are able to make effective plans, find material errors, and communicate effectively on the recommendations produced. This shows that the audit work is of high quality.

The test results provide empirical evidence that Hypothesis 4 is not supported. This is because internal audit effectiveness is influenced more by mastery of information technology. This is evidenced by the significant direct effect of information technology on internal audit effectiveness compared to the indirect effect of audit quality on internal audit effectiveness. In the context of the current research, information technology is the dominant construct for measuring internal audit effectiveness. Audit quality owned by the object of research does not intersect with information technology, considering the size of audit quality, coverage of the audited area, effective audit planning, conducting examinations in accordance with standards, effective communication, and audit recommendations. Thus, audit quality does not need to play a mediating role in linking information technology to internal audit effectiveness.

Conclusion

Based on the results of the study, it can be concluded that information technology affects the effectiveness of internal audits, but not competence and professional skills. Furthermore, audit quality mediates the effect of competence and professional skills but does not mediate the effect of information technology on the effectiveness of internal audits. This study provides theoretical implications, including confirming institutional theory (Meyer & Rowan, 1977; Zucker, 1987) as the basis for organizations to make changes through forms of isomorphism to obtain legitimacy that has an impact on improving performance. This study also supports the concept of internal audit effectiveness by White (1976) showing that when there is audit conformity with the standards in this study, that is, the use of information technology and audit quality, the effectiveness of internal audits will be achieved.

This study provides practical implications for city and district government inspectorates in North Sulawesi to increase IT use of information technology in the audit process. E-Audit and the Village Financial System (SISKEUDES) help auditors execute audit assignments to ensure that local governments implement the governance process in accordance with regulations and prevent fraud. Furthermore, the inspectorate collaborates with the Financial and Development Supervisory Agency (BPKP), which is the government's internal supervisory apparatus (APIP), to improve the competence and professional skills of internal auditors by holding training/workshops, which increases the ability to perform audit procedures and find errors in the accounting system and financial reports to achieve more effective fraud prevention.

This study has some limitations. The population was taken from only one province, North Sulawesi, regardless of cultural and demographic aspects. Further research can be conducted on the population of internal auditors throughout Indonesia for broader generalization, then consider the effect of community beliefs and attitudes on the effectiveness of internal audits, or test whether auditor perceptions are influenced by age, gender, and/or race.

The test results provide empirical evidence to support Hypothesis 5. Audit quality fully mediates the effects of competence and professional skills on internal audit effectiveness. This means that higher audit quality, as a result of professional competence and skills, increases the effectiveness of internal audits. This result supports Quality Theory, one of the criteria for assessing service quality, in which the service provider has the professionalism and skills needed to solve problems (Teas, 1994). In the context of internal audits, DeAngelo (1981) revealed a

similar finding: a quality audit is assessed based on the auditor's ability to find and report material misstatements in the client's financial statements. Internal auditors with experience, proper educational and professional qualifications, and participation in ongoing professional training will be able to improve the auditor's ability to find misstatements in financial statements, in other words, improve the quality of the internal auditor's work. Furthermore, institutional theory states that coercive pressure (government regulations) underlies the function of internal auditors in realizing their effectiveness by complying with professional behavioral norms set by standards. Thus, when the internal auditor executes his/her assignment according to applicable standards, or in other words, when his/her audit work is of high quality, he/she will be able to perform his/her role effectively.

References

Abbott, L. J., Daugherty, B., Parker, S., & Peters, G. F. (2016). Internal audit quality and financial reporting quality: The Joint Importance of Independence and Competence. *Journal of Accounting Research*, *54*(1), 3–40. https://doi.org/10.1111/1475-679X.12099

Alkebsi, M., & Aziz, K. A. (2017). Information technology usage, top management support, and internal audit effectiveness. *Asian Journal of Accounting and Governance*, *8*(Special Issue), 123–132. https://doi.org/10.17576/ajag-2017-08si-11

Alqudah, H., Amran, N. A., Hassan, H., Lutfi, A., Alessa, N., Alrawad, M., & Almaiah, M. A. (2023). Examining the critical factors of internal audit effectiveness from internal auditors' perspective: Moderating role of extrinsic rewards. *Heliyon*, *9*(10). https://doi.org/10.1016/j.heliyon.2023.e20497

Al-Twaijry, A. A. M., Brierley, J. A., & Gwilliam, D. R. (2003). The development of internal audit in Saudi Arabia: An institutional theory perspective. *Critical Perspectives on Accounting*, *14*(5), 507–531. https://doi.org/10.1016/S1045-2354(02)00158-2

Alzeban, A., & Gwilliam, D. (2014). Factors affecting the internal audit effectiveness: A survey of the Saudi public sector. *Journal of International Accounting, Auditing and Taxation*, *23*(2), 74–86. https://doi.org/10.1016/j.intaccaudtax.2014.06.001

Arena, M., & Azzone, G. (2009). Identifying organizational drivers of internal audit effectiveness. *International Journal of Auditing*, *13*(1), 43–60. https://doi.org/https://doi.org/10.1111/j.1099-1123.2008.00392.x

Asiedu, K. F., & Deffor, E. W. (2017). Fighting corruption by means of effective internal audit function: Evidence from the Ghanaian public sector. *International Journal of Auditing*, *21*(1), 82–99. https://doi.org/10.1111/ijau.12082

Asosiasi Auditor Intern Pemerintah Indonesia. (2013). *Standar audit intern pemerintah Indonesia*. https://bsn.go.id/uploads/artikel/standar_audit_intern_pemerintah_indonesia.pdf

Ayassrah, A. Y. A. B. A., Atta, A. A. M. B., Alawawdeh, H. A., Aljundi, N. A., Morshed, A., Dahbour, S. A., & Alqaraleh, M. H. (2023). The effect of system quality and user quality of information technology on internal audit effectiveness in Jordan, and the moderating effect of management support. *Applied Mathematics and Information Sciences*, *17*(5), 859–866. https://doi.org/10.18576/AMIS/170512

Badara, M., & Saidin, S. (2013). Antecedents of internal audit effectiveness: A moderating effect of effective audit committee at local government level in Nigeria. *Journal of Social and Development Sciences*, *4*(1), 16–23. https://doi.org/10.5923/j.ijfa.20130202.05

Bierstaker, J. L., Burnaby, P., & Thibodeau, J. (2001). The impact of information technology on the audit process: An assessment of the state of the art and implications for the future. *Managerial Auditing Journal*, *16*(3), 159–164. https://doi.org/10.1108/02686900110385489

Bou-Raad, G. (2000). Internal auditors and a value-added approach: The new business regime. *Managerial Auditing Journal*, *15*(4), 182–187. https://doi.org/10.1108/02686900010322461

BPKP. (2023). Laporan kinerja. *Badan Pengawasan Keuangan dan Pembangunan Perwakilan Provinsi Sulawesi Utara*. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.bpkp.go.id/public/upload/unit/sulut/files/LAPKIN Triwulan II 2023.pdf

Cohen, A., & Sayag, G. (2010). The effectiveness of internal auditing: An empirical examination of its determinants in Israeli organisations. *Australian Accounting Review*, *20*(3), 296–307. https://doi.org/10.1111/j.1835-2561.2010.00092.x

DeAngelo, L. E. (1981). Auditor size and audit fees. *Journal of Accounting and Economics*, *3*(3), 183–199. https://doi.org/10.1016/0165-4101(81)90002-1

Deribe, W. J., & Regasa, D. G. (2014). Factors determining internal audit quality : Empirical evidence from Ethiopian commercial banks. *Research Journal of Finance and Accounting*, *5*(23), 86–95.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147–160. https://doi.org/10.2307/2095101

Endaya, K. A., & Hanefah, M. M. (2016). Internal auditor characteristics, internal audit effectiveness, and moderating effect of senior management. *Journal of Economic and Administrative Sciences*, *32*(2), 160–176. https://doi.org/10.1108/jeas-07-2015-0023

Glazer, A. S., & Jaenike, H. R. (1980). *A framework for evaluating an internal audit function*. Foundation for Auditability Research and Education.

Gul, F. A., Wu, D., Yang, Z., Basu, S., Chen, S., Chen, Z., Choi, J.-H., Goodwin, J., Guan, Y., Hu, B., Kim, J.-B., Li, Y., Peltier, E., Su, N., Su, X., Yu, Y., & Zhang, Y. (2013). Do individual auditors affect audit quality? Evidence from Archival Data. *The Accounting Review*, *88*(6), 1993–2023. https://doi.org/10.2308/accr-50536

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Halbouni, S. S., Obeid, N., & Garbou, A. (2016). Corporate governance and information technology in fraud prevention and detection: Evidence from the UAE. *Managerial Auditing Journal*, *31*(6–7), 589–628. https://doi.org/10.1108/MAJ-02-2015-1163

Kantohe, M. S., Sudarma, M., Subekti, I., & Adib, N. (2021). Determinants of internal audit quality in provincial government. *Turkish Online Journal of Qualitative Inquiry (TOJQI)*, *12*(6), 684-694. https://www.tojqi.net/index.php/journal/article/view/1202

Lenz, R., Sarens, G., & D'Silva, K. (2014). Probing the discriminatory power of characteristics of internal audit functions: Sorting the wheat from the chaff. *International Journal of Auditing*, *18*(2), 126–138. https://doi.org/10.1111/ijau.12017

Lenz, R., Sarens, G., & Jeppesen, K. K. (2018). In search of a measure of effectiveness for internal audit functions: An institutional perspective. *EDPACS*, *58*(2), 1–36. https://doi.org/10.1080/07366981.2018.1511324

Lin, J. W., Li, J. F., & Yang, J. S. (2006). The effect of audit committee performance on earnings quality. *Managerial Auditing Journal*, *21*(9), 921–933. https://doi.org/10.1108/02686900610705019

Lonto, M. (2022). *Efektivitas audit internal untuk pencegahan fraud pada pemerintah daerah*. Universitas Brawijaya.

Lonto, M. P., Ganis Sukoharsono, E., Baridwan, Z., Yeney, &, & Prihatiningtias, W. (2023). The ffectiveness of internal audit for fraud prevention. *Australasian Accounting, Business and Finance Journal*, *17*(3), 171–190. https://doi.org/https://doi.org/10.14453/aabfj.v17i3.11

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, *58*, 593–614. https://doi.org/10.1146/annurev.psych.58.110405.085542

Mahmudah, H., & Riyanto, B. (2017). Keefektifan audit internal pemerintah daerah. *Jurnal Akuntansi*, *20*(1), 33. https://doi.org/10.24912/ja.v20i1.74

Marcel. (2023, April 20). Diduga korupsi APBD, Diskominfo Tomohon dilaporkan ke Polres Kota Tomohon. *Editorial Sulut News*. https://www.editorialsulutnews.co.id/2023/04/diduga-korupsi-apbd-diskominfo-tomohon.html

Menteri Negara Pendayagunaan Aparatur Negara. (2008). *Standar Audit Aparat Pengawasan Intern Pemerintah (SA-APIP)*.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, *83*(2), 340–363. https://doi.org/10.1086/226550

Mihret, D. G., & Yismaw, A. W. (2007). Internal audit effectiveness: An Ethiopian public sector case study. *Managerial Auditing Journal*, *22*(5), 470–484. https://doi.org/10.1108/02686900710750757

Mulyani, S., Kasim, E., Yadiati, W., & Umar, H. (2019). Influence of accounting information systems and internal

audit on fraudulent financial reporting. *Opcion*, *35*(21), 323–338.

Nwabuisi, A., & Israel, I. (2021). *Internal audit and fraud detection in selected banks listed in Nigeria. IOSR Journal of Economics and Finance*, *12*(4), 55–65. https://doi.org/10.9790/5933-1204045165

Pedrosa, I., & Costa, C. J. (2012). Financial auditing and surveys: How are financial auditors using information technology?: An approach using expert interviews. *ACM International Conference Proceeding Series*, 37–43. https://doi.org/10.1145/2311917.2311925

Pizzini, M., Lin, S., & Ziegenfuss, D. E. (2012). The impact of internal audit function quality and contribution on audit delay. *Auditing: A Journal of Practice & Theory*, *34*(1), 25–58. https://doi.org/10.2308/ajpt-50848

Prawitt, D. F., Sharp, N. Y., & Wood, D. A. (2012). Internal audit outsourcing and the risk of misleading or fraudulent financial reporting: Did Sarbanes-Oxley get it wrong?. *Contemporary Accounting Research*, *29*(4), 1109–1136. https://doi.org/10.1111/j.1911-3846.2012.01141.x

Ramazanova, K. M., & Nurgaliyeva, A. M. (2023). Information technologies as one of the important factors in the development of the effectiveness of internal audit. *Bulletin of The Karaganda University Economy Series*, *109*(1), 123–131. https://doi.org/10.31489/2023ec1/123-131

Renwas. (2018, November 3). *Sosialisasi Peningkatan Kapabilitas APIP*. http://inspektorat.sulutprov.go.id/berita-165-sosialisasi-peningkatan-kapabilitas-apip.html

Reskia, R., & Sofie. (2022). Pengaruh internal audit, anti fraud awarness, komitmen organisasi dan budaya organisasi terhadap pencegahan fraud (Studi kasus PT. Inti Persada Nusantara). *Jurnal Ekonomi Trisakti*, *2*(2), 419–432. https://doi.org/10.25105/jet.v2i2.14531

Ridley, J., & D'Silva, K. (1997). A question of values. *Internal Auditor*, *2*(1), 16-19.

Rudhani, L. H., Berisha Vokshi, N., & Hashani[e], S. (2017). Factors contributing to the effectiveness of internal audit: Case study of internal audit in the public sector in Kosovo. *Journal of Accounting, Finance and Auditing Studies*, *3*(4), 91–108. https://doi.org/https://doi.org/10.56578/jafas030404

Salehi, M., & Husini, R. (2011). A study of the effect of information technology on internal auditing: Some Iranian evidence. *African Journal of Business Management*, *5*(15), 6168–6178. https://doi.org/10.5897/AJBM10.1013

Saputra, W. (2015). The impact of auditor's independence on audit quality: A theoretical approach. *International Journal of Scientific & Technology Research*, *4*(8), 348–353. www.ijstr.org

Satava, D., Caldwell, C., & Richards, L. (2006). Ethics and the auditing culture: Rethinking the foundation of accounting and auditing. *Journal of Business Ethics*, *64*(3), 271–284. https://doi.org/10.1007/s10551-005-0556-y

Sawyer, B. L. (1995, August). An internal audit philosophy. *Internal Auditor*, *52*(4), 46–55.

Shohihah, I., Djamhuri, A., & Purwanti, L. (2018). Determinants of internal audit effectiveness and implication on corruption prevention in the religious ministry. *Indonesian Journal of Social & Humanity Study/Wacana, 21*(1), 1–14.

Sila, M. (2016). Pengaruh karakteristik auditor terhadap kualitas audit dengan mediasi pertimbangan auditor (Studi pada auditor kantor perwakilan BPK RI). *Universitas Brawijaya*.

Standar Internasional Praktik Profesional Audit Internal, Standar 1 (2016).

Sutaryo. (2018). Determinan efektivitas audit internal di inspektorat provinsi Jawa Timur. *Jurnal Ilmiah Akuntansi Dan Bisnis*, *13*(1), 1–10. https://doi.org/10.24843/JIAB.2018.v13.i01.p01

Ta, T. T., & Doan, T. N. (2022). Factors affecting internal audit effectiveness: Empirical evidence from Vietnam. *International Journal of Financial Studies*, *10*(2). https://doi.org/10.3390/ijfs10020037

Tackie, G., Marfo-Yiadom, E., & Oduro Achina, S. (2016). Determinants of Internal Audit Effectiveness in Decentralized Local Government Administrative Systems. *International Journal of Business and Management*, *11*(11), 184. https://doi.org/10.5539/ijbm.v11n11p184

Teas, R. K. (1994). Expectations as a comparison standard in measuring service quality: An assessment of a reassessment. *Journal of Marketing*, *58*(1), 132. https://doi.org/10.2307/1252257

Turetken, O., Jethefer, S., & Ozkan, B. (2020). Internal audit effectiveness: operationalization and influencing

factors. *Managerial Auditing Journal*, *35*(2), 238–271. https://doi.org/10.1108/MAJ-08-2018-1980

Umar, R. (2022, Desember 29). 5 Kasus korupsi di Sulawesi Utara naik ke tahap penyidikan, VAP jadi tersangka. *Tribun Sulut*. https://manado.tribunnews.com/2022/12/29/tahun-2022-5-kasus-korupsi-di-polda-sulawesi-utara-naik-ke-tahap-penyidikan-vap-jadi-tersangka?page=all

White, A. W. (1976). The essentials for the effective internal audit department. *Internal Auditor*, *12*(3), 30–33.

Yadnyana, I. K. (2009). Pengatuh kualitas jasa auditor internal terhadap pengendalian intern pada hotel berbintang empat dan lima di Bali. *Jurnal Ilmiah Akuntansi Dan Bisnis*, *4*(1). https://ojs.unud.ac.id/index.php/jiab/article/view/2579

Ziegenfuss, D. E. (2000). Measuring performance. *Internal Auditor*, *57*(1), 36–40.

Zucker, L. G. (1987). Institutional theories of organization. *Annual Review of Sociology*, *13*. 443–464. https://doi.org/10.1146/annurev.soc.13.1.443