

“Remote audit as a moderator of the relationship between auditor digital competence, IT support, and audit quality”

AUTHORS	Oyong Lisa 
	
	Riza Bahtiar Sulistyan 
	
	Imanita Septian Rusdianti 
	ResearcherID: https://www.webofscience.com/wos/author/record/LEL-8507-2024
	Umi Muawanah 
	Djuni Farhan 

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© Oyong Lisa, Riza Bahtiar Sulistyan,
Imanita Septian Rusdianti, Umi
Muawanah, Djuni Farhan, 2026

Oyong Lisa, Lecturer, Department of
Accounting, Faculty of Economics
and Business, Universitas Gajayana
[Gajayana University], Indonesia.
(Corresponding author)

Riza Bahtiar Sulistyan, Lecturer,
Department of Management, Faculty
of Economics and Business, Institut
Teknologi dan Sains Mandala [Mandala
Institute of Technology and Science],
Indonesia.

Imanita Septian Rusdianti, Lecturer,
Department of Entrepreneurship,
Faculty of Administration and Business,
Universitas Lumajang [Lumajang
University], Indonesia.

Umi Muawanah, Lecturer, Department
of Accounting, Faculty of Economics
and Business, Universitas Gajayana
[Gajayana University], Indonesia.

Djuni Farhan, Lecturer, Department
of Accounting, Faculty of Economics
and Business, Universitas Gajayana
[Gajayana University], Indonesia.



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Oyong Lisa (Indonesia), Riza Bahtiar Sulistyan (Indonesia),
Imanita Septian Rusdianti (Indonesia), Umi Muawanah (Indonesia),
Djuni Farhan (Indonesia)

REMOTE AUDIT AS A MODERATOR OF THE RELATIONSHIP BETWEEN AUDITOR DIGITAL COMPETENCE, IT SUPPORT, AND AUDIT QUALITY

Abstract

The rapid shift toward remote auditing since the COVID-19 pandemic has made auditor digital competence and organizational information technology (IT) support decisive factors for sustaining audit quality, yet empirical evidence on how remote audit conditions shape these relationships remains limited. This study aims to examine the effects of auditor digital competence and IT support on audit quality and to test whether remote audit moderates these two relationships. A quantitative explanatory approach was used, applying Partial Least Squares – Structural Equation Modeling (PLS-SEM) with SmartPLS on data from 160 external auditors working at Big Four-affiliated public accounting firms operating in Malang City, Indonesia, selected through purposive sampling. The results show that auditor digital competence ($\beta = 0.267$; $t = 3.374$; $p = 0.001$) and IT support ($\beta = 0.889$; $t = 3.134$; $p = 0.002$) both have a positive and significant effect on audit quality ($R^2 = 0.414$). Remote audit significantly strengthens the effect of auditor digital competence on audit quality ($\beta = 0.148$; $t = 2.020$; $p = 0.045$), but does not significantly moderate the effect of IT support on audit quality ($\beta = 0.061$; $t = 0.925$; $p = 0.357$). These findings indicate that auditor digital competence becomes increasingly critical for audit quality as audits move to remote settings, while the contribution of IT support remains consistently strong regardless of audit mode, offering practical implications for digital audit training and IT infrastructure policy in public accounting firms.

Keywords

auditor, competence, technology, audit, quality,
digitalization

JEL Classification

M42, M15, G32

INTRODUCTION

The development of information technology in the last decade has driven massive digital transformation in various sectors, including the world of auditing. Digitalization is changing the way auditors work in gathering evidence, assessing risks, and compiling audit reports. The demands for transparency, accountability, and the acceleration of financial reporting are increasing, so the auditing profession is required to continue to adapt. Technical accounting and auditing skills alone are no longer adequate because auditors must now have digital competence. Digital competencies include mastery of information technology, understanding of accounting information systems, the ability to use digital-based audit software, and data analysis skills through data analytics techniques. This competency allows auditors to detect audit anomalies and risks more quickly and accurately. The COVID-19 pandemic accelerated the need for digital audits as many organizations switched to remote auditing. Remote auditing is a practical solution, yet it entails new challenges such as limited access to systems, data security risks, and communication barriers. Therefore, digital competence and information technology support are important factors in maintaining audit quality.

This research was conducted among external auditors physically working in Malang City, East Java, Indonesia, at Public Accounting Firms affiliated with the Big Four international audit networks (Deloitte, EY, KPMG, and PwC) that maintain a practice presence in the city. Malang was selected because, as an educational and economic center in East Java, it hosts a substantial concentration of Big Four-affiliated practice offices that actively conduct external audits for regional clients, while remaining distinct from the head-office context of Jakarta-based studies that dominate the existing literature. Auditors at these Malang-based offices face the same demands to adapt to rapidly developing information technology and to client organizations' expanding technology infrastructure as their counterparts elsewhere, while operating within a comparatively smaller, regionally embedded practice environment. Post-pandemic conditions have made remote auditing a routine part of practice at these offices, requiring auditors to rely on adequate IT support for real-time data access, an expanded audit scope, and timely reporting. Focusing on Big Four-affiliated auditors in a secondary city such as Malang therefore provides an empirical setting that is representative of high audit-quality demands and technological adaptation pressures, while offering a regional counterpoint to studies conducted in major metropolitan audit hubs.

1. LITERATURE REVIEW AND HYPOTHESES

Audit quality has long been established in the archival auditing literature as a multidimensional construct reflecting an auditor's joint probability of detecting a material misstatement and faithfully reporting it, a definition that emphasizes both technical competence and the auditor's operating conditions rather than either alone. Darmawan (2023) further situates audit quality as the foundation of financial reporting transparency, arguing that it is produced not by a single input but by the interaction of auditor capability, organizational support, and the methods through which audits are executed. This framing is consistent with DeFond and Zhang's (2014) synthesis of decades of archival research, which shows that audit quality proxies respond systematically to auditor-level competence, client and engagement characteristics, and the technological and procedural context of the engagement. Building on this foundation, the present review first traces how digital transformation has reshaped the technical and organizational inputs to auditing, before turning to the specific roles of auditor digital competence, IT support, and remote audit as an execution context, and finally to the hypotheses that connect them.

The development of information technology in the last decade has driven massive digital transformation in various sectors, including in the world of auditing (Otia & Bracci, 2022). This digitalization affects the way auditors work in collecting evidence, assessing risks, and preparing audit reports

(Leocádio et al., 2024; Sundarasan et al., 2026). Amid increasing demands for transparency, accountability, and acceleration of financial reporting, the auditor profession is required to continue to adapt (Syam et al., 2025). Technical skills in accounting and auditing alone are no longer sufficient. Auditors must now have digital competencies that include mastery of information technology, understanding of accounting information systems, the ability to use digital-based audit software, and skills in analyzing data comprehensively through data analytics techniques (Nurharjanti, 2024). This aims to enable auditors to identify anomalies and audit risks more quickly and accurately, which ultimately has an impact on improving the quality of audits performed.

In line with the increasing need for digital auditor competency, information technology (IT) support in the organization is also a very crucial aspect in ensuring the smoothness and success of the audit process (Feliciano & Quick, 2022). Organizations that have good IT infrastructure can facilitate auditors in obtaining real-time data access, expanding the scope of the examination, and accelerating the process of reporting audit results. Advanced technologies such as cloud computing and big data have become an integral part of modern audit practices. Through cloud computing, auditors can access audit documents and information from various locations without time and place constraints. Big data allows auditors to process and analyze large amounts of data to detect potential fraud or material errors. Both contribute to time efficiency, analysis precision, and increased accuracy of audit

reports (Leng & Zhang, 2024). Manita et al. (2020) confirm that auditors with high digital literacy are able to carry out audit procedures more efficiently and accurately, resulting in more reliable audit opinions. This is supported by research results of Hubais et al. (2023), Velte (2022), Hasibuan et al. (2022), and Alsughayer (2021) that auditor competence affects audit quality.

The need for mastery of digital technology and systems has become increasingly urgent since the world faced disruption due to the COVID-19 pandemic (Ambrogio et al., 2022). This pandemic has changed the way many organizations work, including in the implementation of audits, which are now carried out remotely (Farcane et al., 2023). Remote audits allow auditors to carry out audit procedures without having to be physically present at the client's location, using technologies such as video conferencing, cloud-based file sharing, and digital audit software (Lorentzon et al., 2023). Although it offers a practical solution in emergencies, remote audits are not without major challenges. Some of these include limited access to sensitive systems and documents, increased risks to data security and privacy, and barriers to communication and coordination with clients virtually. On the other hand, not all auditors have adequate readiness and skills to conduct audits online, which can ultimately affect the effectiveness and quality of the audit results themselves (Alma'aitah et al., 2024). Not only individual competence, but institutional information technology support is also an important variable in ensuring audit process effectiveness. Sophisticated IT infrastructure, cutting-edge software, and a strong cybersecurity system can reduce the risk of human error and increase the speed of data analysis (Ahmad et al., 2023). Stoel and Havelka (2021), Crucean and Hategan (2023), and Ahmad et al. (2023) stated that information technology significantly improves audit quality. This differs from the research results of Yeghaneh et al. (2015), who found that information technology does not affect audit quality.

In the context of this change, it is very important to evaluate the digital competence of auditors, and the support of available information technology can improve audit quality, especially when the audit method used shifts to a remote audit model

(Ismanidar et al., 2025). Audit quality has a very strategic role in maintaining the integrity, transparency, and accountability of financial information. This quality reflects the extent to which auditors can disclose information that is true, reliable, and in accordance with generally accepted accounting principles (Darmawan, 2023). Therefore, audit quality is not only determined by the expertise of the individual auditor, but also by supporting facilities such as the technology system used, access to data, and the audit methods applied (DeFond & Zhang, 2014). Optimal use of technology can help auditors strengthen risk assessments, expand audit coverage, and produce higher quality audit findings.

In the digital era, auditor digital competence and information technology (IT) support are two important factors that influence audit quality (Lisa et al., 2025). Auditors who master technology can carry out audit procedures more efficiently and accurately, while IT support allows fast and secure data access. However, when the audit is conducted remotely, these two factors become even more crucial. Remote audit acts as a moderator variable that strengthens or weakens the influence of digital competence and IT support on audit quality (Rezaee et al., 2002). Li et al. (2023) and Alma'aitah et al. (2024) found that remote audits affect audit quality. In remote audit conditions, auditors are required to be more digitally independent and able to use technology without direct supervision. On the other hand, the quality of remote audits is highly dependent on the readiness of the organization's IT system in providing effective access, security, and communication (Al-Hajaya et al., 2025). Thus, remote audits are not only a new form of audit implementation, but also a determinant of the success of the relationship between auditor capabilities and technological support for achieving optimal audit quality.

Auditor digital competence is the ability to understand and utilize information technology in every stage of the audit process, from data collection and analysis to reporting (Razali et al., 2025). In today's digital era, this competence is very important to ensure that auditors are able to adapt to technology-based accounting information systems and the use of audit software. Theoretically, the relationship between digital competence and audit quality

can be explained through two main approaches. Resource-Based View/RBV) which is put forward Barney (2001), states that organizational excellence can be obtained from valuable and difficult-to-imitate internal resources, including human resource competencies. In the context of auditing, auditor digital competency is a strategic asset that can improve audit efficiency, accuracy, and effectiveness, thus having a direct impact on audit quality. Previous studies have consistently shown that auditor competency has a positive and significant relationship with audit quality. Furiady and Kurnia (2015) emphasized that audit quality is highly dependent on the knowledge, skills, and professionalism of the auditor. Ridzuan et al. (2022) strengthened this finding by stating that understanding technology is part of the competency that influences audit accuracy and effectiveness. Furthermore, Vitali and Giuliani (2024) revealed that the auditor's ability to manage and analyze digital data is a distinct advantage in increasing the efficiency of audit procedures. Leocádio et al. (2024) also show that auditors with high digital competency are better able to face modern audit challenges and produce more accurate opinions. This is in line with Alsughayer (2021), who showed that in a technology-based audit environment, digital competency is the main determinant in maintaining audit quality.

Information technology is a set of tools used to collect, store, process, and distribute information to support decision-making, coordination, analysis, and control in an organization (Laudon & Laudon, 2007). IT support in audits allows auditors to obtain data quickly and accurately and assists in the system-based analysis process. Information technology (IT) support is an important element in supporting the implementation of efficient, accurate, and reliable audits. IT support includes information system infrastructure, audit software, data security, and real-time data integration that supports auditors in conducting more comprehensive examinations and analyses (Hossain, 2025). In the context of an audit, a good information technology system can improve the auditor's ability to access information, analyze digital data efficiently, and produce timely and quality audit opinions (Herdiana & Nugrahanti, 2025).

Stoel and Havelka (2021) stated that adequate IT support makes it easier for auditors to obtain the data they need quickly and accurately, thereby improving the quality of audit results. Khalil and Nafti (2020) found that using information technology significantly speeds up the audit process and improves reporting quality. Likewise, Eulerich et al. (2023) showed that applying technology in the audit process can reduce human error and increase the reliability of audit results. Nusa (2019) and Junaid et al. (2021) also emphasized that strong IT system support can improve the effectiveness of auditors' internal supervision and control, which ultimately contributes to higher audit quality.

Digital transformation has significantly changed auditing practices, particularly through the implementation of remote audits. Remote audits enable auditors to perform audit procedures without being physically present at the client's location (Al-Hajaya et al., 2025). Since the COVID-19 pandemic, this practice has become increasingly common and has evolved into an audit implementation mode that relies on communication technology, cloud computing, big data, and digital document management systems (Liao et al., 2025). Importantly, remote audit represents the mode or context of audit execution rather than the technological resources themselves. Thus, although remote auditing requires adequate technological support, the availability of information technology does not necessarily mean that an audit is conducted remotely.

In this context, auditor digital competence becomes crucial. Digital competence includes the ability to operate audit technologies, understand clients' information systems, use data analytics-based audit software, and perform audit procedures effectively in a digital environment (Rahmani et al., 2025). Auditors with high digital competence are better able to navigate technology-based audits, interpret data accurately, and identify audit risks effectively (Suyono et al., 2026). However, the effect of digital competence on audit quality may depend on the context in which audit procedures are performed. Remote audit may strengthen this relationship because auditors with high digital competence can opti-

mally utilize digital platforms, access electronic documentation, communicate virtually, and perform audit procedures efficiently. Conversely, when digital competence is low, remote audit may create difficulties in using digital tools, interpreting electronic documentation, and performing audit procedures virtually, potentially reducing audit quality (Al-Hajaya et al., 2025).

Previous studies support the importance of digital competence in technology-enabled auditing. Bin-Nashwan et al. (2025) found that the positive impact of audit technology depends on the readiness of human resources, including digital competence. Similarly, Sewpersadh (2025) showed that technology-based and remote audit practices are more effective when auditors possess adequate digital skills, while Cebi et al. (2024) emphasized the importance of auditors' digital expertise in system-based audit decision-making. Therefore, remote audit is positioned in this study as an audit implementation context that may strengthen or weaken the effect of auditor digital competence on audit quality, rather than as a technological resource itself.

In modern audits, information technology support has become the main foundation in improving the effectiveness and efficiency of the audit process. This support includes information system infrastructure, data analytics-based audit software, cloud computing, cybersecurity, and real-time information availability (Ahmad et al., 2023). Well-integrated information technology allows auditors to access relevant audit data, accelerate substantive and control testing, and produce more accurate and quality audit reports. However, the direct influence of IT support on audit quality often depends on the context of its implementation, and this is where the role of remote audit becomes important as a moderating variable. Remote audits not only change the audit implementation method to be remote-based, but also require more complex IT infrastructure, stable communication systems, and secure and efficient data management (Al-Hajaya et al., 2025). In conventional (face-to-face) audit conditions, IT support may have a limited impact because the auditor's direct interaction with the client can cover system limitations (Brazel et al., 2004). However, in a remote audit environment,

audit quality will depend greatly on the extent to which information technology supports the end-to-end audit process. Strong IT support allows auditors to access documents via the cloud, verify data online, and operate audit software without geographical barriers. This ultimately improves the accuracy, timeliness, and reliability of audit results (Liao et al., 2025). On the other hand, in remote audit conditions, if IT support is inadequate, for example, a slow system, minimal data security, or limited bandwidth, then audit quality can be significantly affected. These obstacles can reduce the effectiveness of audit procedures, increase the risk of errors, and slow down audit completion. Therefore, remote audit acts as a moderator that strengthens or weakens the influence of IT support on audit quality (Al-Hajaya et al., 2025). Sewpersadh's (2025) study shows that the success of an adaptive system-based audit is highly dependent on the ability of technology to provide fast and accurate data access. Meanwhile, Bin-Nashwan et al. (2025) revealed that the implementation of AI and digital audit systems only improves audit quality if supported by adequate IT infrastructure. Similar findings are also shown in the study by Alqudah et al. (2024), which concludes that IT capacity has a direct correlation to audit effectiveness in banking systems, especially when used in remote audits. Thus, remote audits strengthen the strategic role of IT support as a key driver of audit quality, making it a significant moderating element in bridging technological sophistication and reliable audit results.

This is consistent with Suyono et al. (2026), who found that technological infrastructure moderates the relationship between auditor competency and audit effectiveness in AI-driven digital audit settings, suggesting that the strength of technology-related contextual factors, whether framed as infrastructure or as an execution mode such as remote auditing, systematically conditions how audit-related resources translate into audit outcomes.

Taken together, this body of literature indicates a consistent, well-supported direct relationship between auditor digital competence, IT support, and audit quality, while also pointing to remote audit as a contextual factor whose moderating role has been theorized more often than it has been empirically tested for both antecedents simultaneous-

ly. Prior studies have tended to examine remote audit's effect on audit quality directly, or to treat technology readiness as a moderator of auditor competence alone, leaving the specific question of whether remote audit differentially moderates a resource-based factor (auditor digital competence) versus an infrastructure-based factor (IT support) comparatively underexplored. This gap motivates the present study's dual-moderation model, in which remote audit is positioned as the audit-execution context that may condition the strength of both the digital-competence-to-quality and the IT-support-to-quality relationships, allowing their moderating patterns to be compared directly within a single structural model.

Based on the preceding theoretical discussion and empirical evidence, the following hypotheses are proposed:

- H1: Auditor digital competence has a positive effect on audit quality.*
- H2: Information technology support has a positive effect on audit quality.*
- H3: Remote audit moderates the relationship between auditor digital competence and audit quality.*
- H4: Remote audit moderates the relationship between information technology support and audit quality.*

2. METHODS

This study is quantitative and explanatory in nature. It aims to explain the causal relationship between independent variables (auditor digital competence and information technology support) and the dependent variable (audit quality), with remote audit as a moderator. This approach was chosen to test the influence and interaction between variables using statistical data processed objectively. The population consisted of external auditors working at Big Four-affiliated Public Accounting Firms (Deloitte, EY, KPMG, and PwC) operating in Malang City, Indonesia, that have implemented technology-based audits or remote audits. Internal auditors were excluded from the popula-

tion because their reporting lines, independence requirements, and remote-work arrangements differ substantially from those of external auditors, and including both groups would confound the measurement of audit quality as operationalized in this study. The sampling method was carried out using purposive sampling, with the following criteria:

- 1) active external auditors employed at a Big Four-affiliated firm in Malang City;
- 2) at least 2 years of audit experience;
- 3) currently using, or having used, a remote audit system; and
- 4) having experience using technology-based audit tools.

The number of respondents was determined based on the formula of Hair et al. (2014), which recommends a minimum of 5-10 times the number of indicators, and because this instrument consists of 16 indicators, the minimum sample size is 80 respondents and a maximum of 160 respondents. In this study, the respondents numbered 160 respondents. A total of 160 questionnaires were distributed, and all 160 questionnaires were returned and valid, resulting in a 100% response rate. Accordingly, 160 respondents were included in the analysis. Table 1 presents the demographics of the respondents in this study.

Table 1 shows that the cohort of auditors who took part in the study was mainly male, accounting for 92 respondents (57.5%), while the female auditors comprised 68 respondents (42.5%). As for the age distribution, the leading group was made up of auditors aged 43-52 years, who represented 80 respondents (50.0%), followed by those aged 33-42 (31.2%) and finally, the youngest group of 23-32 years (18.8%). This composition shows that most respondents are in the career development stage and thus, their skills in digital technology and the quality of their audit work can be assessed more accurately in the context of professional practice.

When it comes to academic qualifications, most respondents (114 or 71.3%) were graduates (S1), while 46 (28.7%) had master's degrees. This por-

Table 1. Respondent demographics

Demographics	Category	Frequency	Percentage
Gender	Male	92	57.5
	Female	68	42.5
Age	23-32 years old	30	18.8
	33-42 years old	50	31.2
	43-52 years old	80	50.0
Education	Bachelor's degree (S1)	114	71.3
	Master's degree (S2)	46	28.7
Office	Deloitte	45	28.1
	EY	35	21.9
	KPMG	24	15.0
	PWC	56	35.0
Work Experience	2-7 years	45	28.1
	8-14 years old	60	37.5
	15-21 years old	55	34.4
Departments	Junior Audit	63	39.4
	Senior Audit	76	47.5
	Manager	9	5.6
	Senior Manager	7	4.4
	Partner	5	3.1

trays that the majority of auditors have a solid academic background in accounting and auditing, which has been further developed by work experience and IT skills. In terms of the respondents' office locations, they were distributed over the four major public accounting firms, with PwC taking the largest share of 56 (35.0%), followed by Deloitte with 45 (28.1%), EY with 35 (21.9%), and KPMG with 24 (15.0%). This distribution also supports the legitimacy of the data, as it mirrors the audit practices of the Big Four, which are heavily involved in the digital audit technology implementation.

Most respondents had work experience of medium to long duration, with over 60 (37.5%) working for 8 to 14 years and 55 (34.4%) for 15 to 21 years, while 45 (28.1%) had 2 to 7 years of experience. This distribution reveals that the majority of respondents are highly experienced in modern auditing practices, including remote auditing. Moreover, in terms of position, the most frequently occupied post was Senior Auditor with 76 (47.5%), followed by Junior Auditor with 63 (39.4%). In the meantime, the management level was made up of 9 Managers (5.6%), 7 Senior Managers (4.4%), and 5 Partners (3.1%). Such a composition of positions indicates that the larger portion of the respondents are auditors, who are in fact progressing along to the end of the audit; hence, the perceptions of the auditor's digital competence, the role of information technology, and the effec-

tiveness of remote audits as moderating factors for audit quality would be very relevant and empirical for analysis.

Primary data were collected through a Google Forms-based questionnaire or other online survey platforms. The measurement scale used was a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). In This study examines four main variables: auditor digital competence, information technology support, audit quality, and remote audit as a moderating variable. The operational definitions and measurement indicators of these variables are presented as follows:

- 1. Auditor Digital Competence.** Auditor digital competence refers to an auditor's ability to understand and use information technology and digital systems in the audit process. This variable is measured using three indicators:
 - 1) the ability to use audit software;
 - 2) mastery of accounting information systems; and
 - 3) skills in digital data processing (Alsughayer, 2021).
- 2. Information Technology Support.** Information technology support refers to the extent to

which an organization provides technological facilities and infrastructure to enable auditors to perform their work effectively and efficiently. Based on Laudon and Laudon (2007), this variable is measured using six indicators:

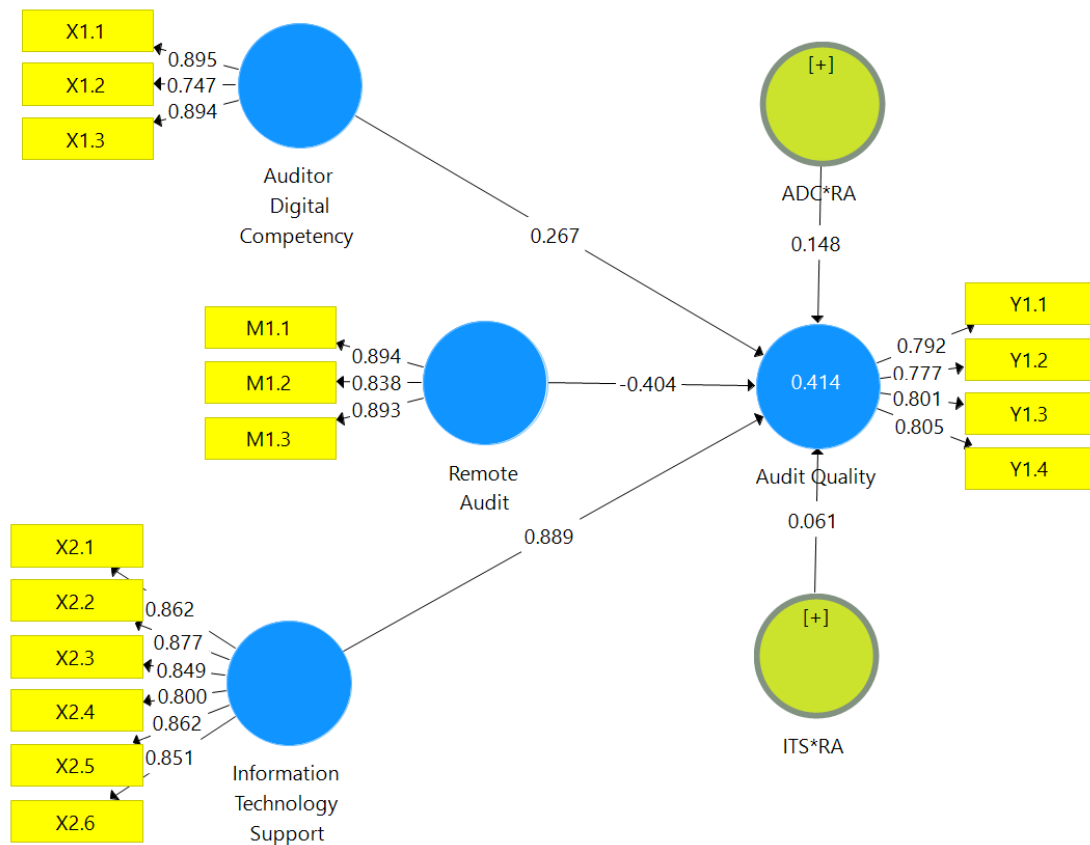
- 1) availability of information technology infrastructure;
 - 2) availability of appropriate audit software;
 - 3) integration of information systems into the audit process;
 - 4) system reliability;
 - 5) utilization of cloud-based technology; and
 - 6) ease of use of information technology systems.
3. **Audit Quality.** Audit quality refers to the reliability of audit work in providing accurate and professionally appropriate audit opinions. This variable is measured using four indicators:
- 1) timeliness;
 - 2) sufficiency of audit evidence;
 - 3) compliance with auditing standards; and
 - 4) auditor objectivity (Furiady & Kurnia, 2015).
4. **Remote Audit.** Remote audit refers to audit practices conducted remotely using digital technologies without the auditor's physical presence at the client's location. In this study, remote audit serves as a moderating variable in the relationships between auditor digital competence and audit quality, and between information technology support and audit quality. This variable is measured using three indicators:
- 1) use of virtual collaboration platforms;
 - 2) remote access to systems and audit-related information; and
 - 3) effectiveness of online communication (Al-Hajaya et al., 2025).

The data analysis technique in this study uses the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, which is processed with the help of the latest version of SmartPLS software. PLS-SEM was chosen because it has advantages in analyzing structural models with complex latent indicators and is able to accommodate relatively small sample sizes and non-normal data distributions. The analysis was carried out in two stages, namely testing the measurement model (outer model) and testing the structural model (inner model). Outer model testing aims to evaluate the validity and reliability of indicators, with criteria such as loading factor values (>0.70), Average Variance Extracted ($AVE > 0.50$), and Composite Reliability (>0.70). Furthermore, inner model testing is used to test the relationship between constructs through path coefficient values, R^2 values, and significance tests using the bootstrapping method. To test the moderation effect (remote audit), moderated regression analysis (MRA) is used in the PLS framework by creating interaction terms between independent and moderator variables. The analysis results are the basis for testing hypotheses and understanding the direct and interactional influences between variables in the research model.

3. RESULTS

The results of the SmartPLS data analysis are presented in Figure 1, which illustrates the structural equation model and the relationships among Auditor Digital Competence, Information Technology Support, Remote Audit, and Audit Quality. The model also examines the moderating role of Remote Audit in the relationships between Auditor Digital Competence and Audit Quality, and between Information Technology Support and Audit Quality. Each construct is measured using its respective indicators, whose measurement properties are evaluated through the measurement model assessment.

Figure 1 presents the structural model and the outer loadings of the measurement indicators. Auditor Digital Competence is measured using three indicators (X1.1, X1.2, and X1.3), with loading values of 0.895, 0.747, and 0.894, respectively. Remote Audit is measured using three indicators



Note: The figure presents the outer loadings of the measurement indicators and the inner path coefficients for Auditor Digital Competency, Information Technology Support, Remote Audit, the interaction terms ($ADC \times RA$ and $ITS \times RA$), and Audit Quality.

Figure 1. Structural model (SEM) results

(M1.1, M1.2, and M1.3), with loading values of 0.894, 0.838, and 0.893, respectively. Information Technology Support is measured using six indicators (X2.1-X2.6), with loading values ranging from 0.800 to 0.877. Audit Quality is measured using four indicators (Y1.1-Y1.4), with loading values of 0.777 to 0.805. Overall, the indicator loadings are consistent with the values reported in the measurement model results, although X1.2 has a loading below 0.70 and should therefore be interpreted with appropriate caution. All indicator loadings exceed the commonly used threshold of 0.70, supporting the convergent validity of the measurement indicators.

Table 2 shows that each indicator has a higher loading value on its original construct compared to other constructs, providing evidence supporting discriminant validity. Indicators X1.1 to X1.3 show the highest loading values on the Auditor Digital Competency construct, with values of 0.895, 0.747, and 0.894, respectively. These values are higher

than their respective cross-loadings on the other constructs, indicating that the indicators are more strongly associated with the Auditor Digital Competency construct. Likewise, indicators X2.1 to X2.6 show the highest loading values on the Information Technology Support construct, ranging from 0.800 to 0.877, compared to their cross-loadings on the other constructs. Furthermore, indicators M1.1 to M1.3 show the highest loading values on the Remote Audit construct, with values of 0.894, 0.838, and 0.893, respectively. These results indicate that the indicators are more strongly associated with the Remote Audit construct than with the other constructs. Finally, indicators Y1.1 to Y1.4 consistently show the highest loading values on the Audit Quality construct, with values of 0.792, 0.777, 0.801, and 0.805, respectively. Overall, the cross-loading results show that all indicators have their highest loading values on their respective intended constructs compared with the cross-loadings on the other constructs. This finding provides evidence supporting the discriminant valid-

Table 2. Cross loadings

Indicator	Audit quality	Digital competency auditor	Information technology support	Remote audit
X1.1	0.341	0.895	0.203	0.179
X1.2	0.314	0.747	0.175	0.158
X1.3	0.396	0.894	0.216	0.201
X2.1	0.436	0.184	0.862	0.757
X2.2	0.441	0.250	0.877	0.812
X2.3	0.429	0.195	0.849	0.783
X2.4	0.332	0.107	0.800	0.701
X2.5	0.426	0.241	0.862	0.832
X2.6	0.538	0.200	0.851	0.725
M1.1	0.429	0.195	0.749	0.894
M1.2	0.332	0.107	0.700	0.838
M1.3	0.426	0.241	0.762	0.893
Y1.1	0.792	0.317	0.674	0.580
Y1.2	0.777	0.350	0.205	0.192
Y1.3	0.801	0.316	0.237	0.216
Y1.4	0.805	0.350	0.265	0.240

Table 3. Construct reliability and validity

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Digital Competency Auditor	0.802	0.884	0.720
Information Technology Support	0.924	0.940	0.723
Remote Audit	0.849	0.908	0.767
Audit Quality	0.824	0.872	0.630

ity of the measurement model and indicates that the constructs in this study can be empirically distinguished from one another.

Based on the results of data processing using SmartPLS, the Cronbach's Alpha value of all variables is above 0.7, namely: Auditor Digital Competency (0.802), Information Technology Support (0.924), Remote Audit (0.849), and Audit Quality (0.824). This indicates that each construct has good and consistent internal reliability. Furthermore, the Composite Reliability value of all variables is also above the 0.7 threshold, which indicates that each construct has high internal consistency in measuring its respective indicators. The CR value for the Auditor Digital Competency variable is 0.884, Information Technology Support is 0.940, Remote Audit is 0.908, and Audit Quality

is 0.872. Meanwhile, the AVE value for all constructs has also met the minimum criteria of 0.5, indicating that the proportion of variance explained by the indicator to the construct is quite large. The AVE value for Auditor Digital Competency is 0.720, Information Technology Support is 0.723, Remote Audit is 0.767, and Audit Quality is 0.630. Overall, these results indicate that all variables in the model have met the criteria for good reliability and construct validity.

Based on Table 4, all HTMT values range from 0.249 to 0.789, below the recommended threshold of 0.90. The highest value is between Information Technology Support and Remote Audit (0.789). These results confirm that all constructs demonstrate adequate discriminant validity and are empirically distinct from each other.

Table 4. HTMT results

Variables	Audit Quality	Auditor Digital Competency	Information Technology Support	Remote Audit
Audit Quality				
Auditor Digital Competency	0.503			
Information Technology Support	0.481	0.267		
Remote audit	0.448	0.249	0.789	

Table 5. Inner VIF value

Variables	Audit Quality
Auditor Digital Competency	1.143
Information Technology Support	2.040
Remote audit	3.823

The inner VIF values range from 1.143 to 3.823, with the highest value observed for Remote Audit (3.823). Since all VIF values are below the threshold of 5.00, the structural model does not indicate a critical multicollinearity problem.

Table 6 shows that the R^2 value for Audit Quality is 0.414, indicating that the model explains 41.4% of the variance in Audit Quality. The Q^2 value of 0.203 indicates that the model has predictive relevance. The f^2 values of 0.107, 0.112, and 0.024 indicate small effect sizes for Auditor Digital Competency, Information Technology Support, and Remote Audit, respectively, on Audit Quality.

Based on the hypothesis testing results in Table 7, three of the four hypotheses were declared tested because they had a significance value (p-value) below 0.05. The influence of Auditor Digital Competency on Audit Quality has an original sample value of 0.267 with a T value of 3.374 and a p-value of 0.001. This shows that the auditor's digital competence significantly improves audit quality, so *H1* is supporting. Information Technology Support also has a significant effect on Audit Quality, with an original sample of 0.889, a T value of 3.134, and a p-value of 0.002, which means that information technology support is very crucial in improving audit quality, so that *H2* is tested. The interaction between Auditor Digital Competency and Remote Audit (ADC*RA) on

Audit Quality is also proven to be significant, with an original sample of 0.148, a t-value of 2.020, and a p-value of 0.045. This means that the auditor's digital competence is increasingly important in the context of remote audits, and *H3* is tested. The effect of interaction between Information Technology Support and Remote Audit (ITS*RA) on Audit Quality is not proven to be significant, because it has a p-value of 0.357 (above 0.05) with a t-value of only 0.925. Thus, *H4* is not tested. In addition to the interaction effects, the structural model also estimated a direct path from Remote Audit to Audit Quality, which was -0.404 . This indicates that, holding the interaction effects constant, higher remote audit engagement is directly associated with lower audit quality in this sample, a result that stands in contrast to the positive moderating role Remote Audit plays in strengthening the Auditor Digital Competency-Audit Quality relationship (*H3*).

To further characterize the two moderation effects, a simple slope analysis was conducted for the ADC*RA and ITS*RA interactions, plotting the relationship between each predictor and Audit Quality at three levels of Remote Audit (-1 SD, mean, and $+1$ SD).

Figure 2 shows that the slope of the ADC-Audit Quality relationship becomes progressively steeper as Remote Audit increases: the line is comparatively flat when Remote Audit is low (-1 SD), moderately steep at the mean level of Remote Audit, and steepest when Remote Audit is high ($+1$ SD). This pattern visually corroborates the significant positive interaction effect reported for *H3* ($\beta = 0.148$; $p = 0.045$): auditor digital competence translates

Table 6. R^2 , Q^2 , and f^2

Variables	R^2	Q^2	f^2
Audit Quality	0.414	0.203	–
Auditor Digital Competency → Audit Quality	–	–	0.107
Information Technology Support → Audit Quality	–	–	0.112
Remote Audit → Audit Quality	–	–	0.024

Table 7. Hypotheses testing

Variables	Original Sample	T Statistics	P Value	Results
Digital Competency Auditor → Audit Quality	0.267	3.374	0.001	<i>H1</i> Accepted
Information Technology Support → Audit Quality	0.889	3.134	0.002	<i>H2</i> Accepted
ADC × RA → Audit Quality	0.148	2.020	0.045	<i>H3</i> Accepted
ITS × RA → Audit Quality	0.061	0.925	0.357	<i>H4</i> Not Accepted
Remote Audit → Audit Quality	-0.404	2.194	0.033	Significant

Simple Slope Analysis

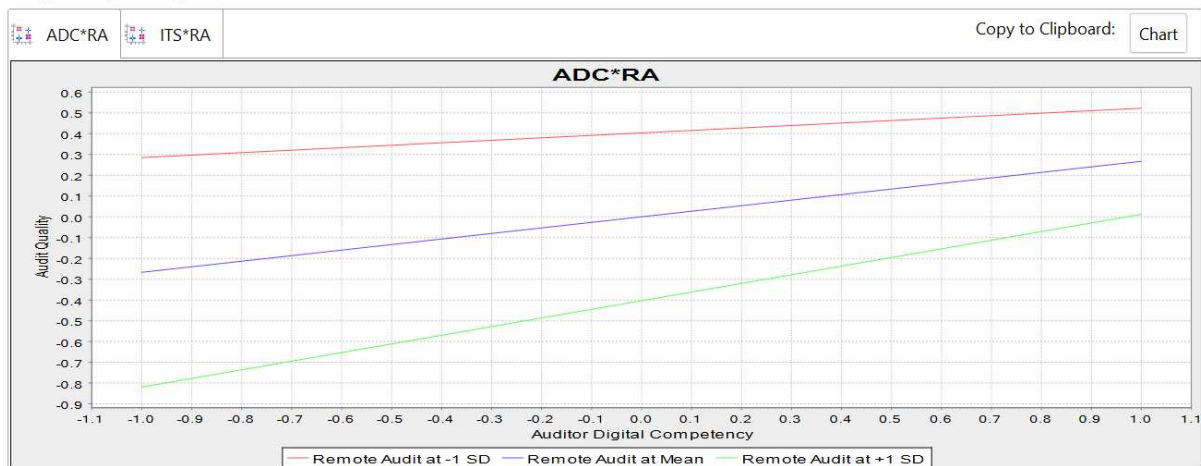


Figure 2. Simple slope plot of Auditor Digital Competency (ADC) on Audit Quality at low, mean, and high levels of Remote Audit (RA)

Simple Slope Analysis

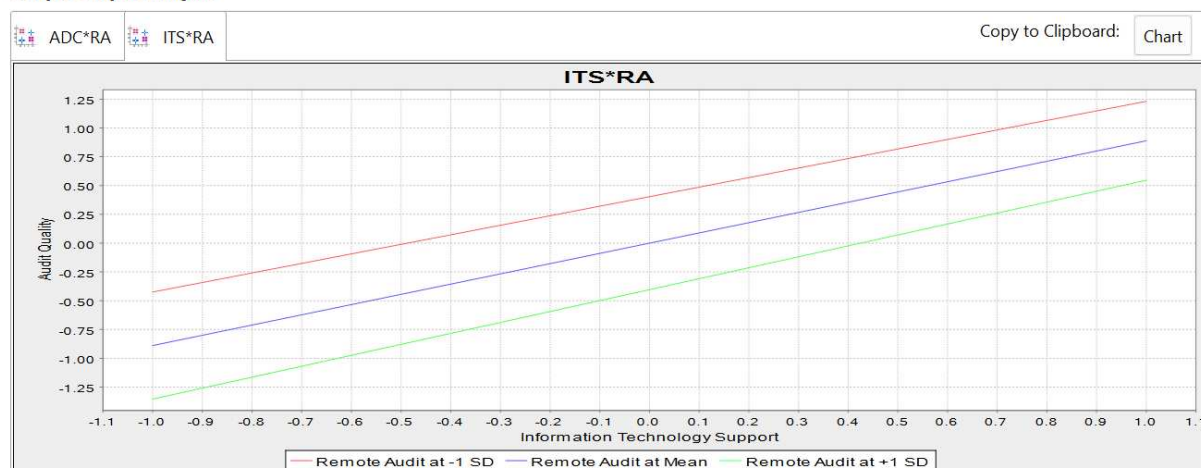


Figure 3. Simple slope plot of Information Technology Support (ITS) on Audit Quality at low, mean, and high levels of Remote Audit (RA)

into a progressively larger improvement in audit quality as audits move further toward a remote execution mode. In contrast, Figure 3 shows that the three slopes for the ITS-Audit Quality relationship at low, mean, and high levels of Remote Audit are close to parallel, differing mainly in their vertical position rather than their steepness. This pattern is consistent with the non-significant interaction effect reported for $H4$ ($\beta = 0.061$; $p = 0.357$): the strength of the relationship between IT support and audit quality remains essentially stable regardless of the extent to which the audit is conducted remotely, even though higher Remote Audit levels are associated with a lower overall audit quality intercept in this sample.

4. DISCUSSION

Auditor digital competence affects audit quality, which means that the greater the auditor's ability to master digital technology, the higher the quality of the audit result can be.

These findings indicate that auditors who are proficient in using audit technology, understanding electronic data, and adapting to digital work processes tend to produce higher-quality audits. These results align with Alsughayer (2021), who asserted that auditor digital literacy increases the effectiveness of technology use in the audit process. Furthermore, these findings are consistent

with Furiady and Kurnia (2015), who demonstrated that auditors' understanding of information systems and technology is a crucial factor in supporting audit quality. Therefore, digital competence not only assists auditors in performing audit procedures but also strengthens their ability to assess risks and test audit evidence more accurately. These findings also support Ridzuan et al. (2022), who stated that mastery of audit technology can improve the efficiency and accuracy of the audit process. This suggests that auditors with strong digital skills are better prepared to face changes in the increasingly technology-based audit environment. Furthermore, these findings align with Leocádio et al. (2024), who emphasize that auditors' digital skills play a crucial role in producing more accurate audits that are responsive to developments in information systems. In this study, these results reinforce that digital competence is one of the main factors determining audit quality in the digital era.

Information technology support affects audit quality, meaning that the higher the quality of the information technology infrastructure owned and used by the organization and auditors, the better the audit results that can be produced. Information technology support includes reliable accounting information systems, computer-based audit software, cloud storage for online document access, and sophisticated data security systems. This technology allows auditors to gain quick access to audit evidence, conduct comprehensive and efficient data checks, and detect irregularities using algorithms or analytical tools. However, it is also important to understand that the effectiveness of IT support for audit quality is greatly influenced by human factors, such as the level of user adoption, adequate training, and the readiness of a digital culture in the organization. Technology will only have a maximum impact if it is used optimally and strategically by competent auditors and organizations that support digital change as a whole. Information Technology (IT) support plays an important role in improving audit quality. In the modern context, the audit process no longer relies solely on manual methods, but has undergone a transformation with the implementation of sophisticated information systems. IT support includes the use of audit software, computer-based accounting systems, and data analysis technol-

ogy that helps auditors collect, process, and analyze data more quickly and accurately. This allows auditors to conduct more comprehensive testing, identify anomalies or risks more precisely, and prepare more reliable audit reports. In addition, information technology also strengthens the internal control system and transparency of the audit process, because all activities can be recorded and traced systematically. These results align with Stoel and Havelka (2021), who show that adequate technology support can improve the quality of processes and audit results. These findings are also consistent with Khalil and Nafti (2020), who assert that the use of digital systems in audits helps speed up the data processing process and improve the accuracy of audits. In addition, Eulerich et al. (2023) state that information technology supports more transparent, structured, and traceable audits. Similarly, Nusa (2019) found that the use of audit technology and digital accounting systems can improve reporting quality and reduce the potential for errors. However, these results differ from Irman et al. (2021), who found no significant influence between IT and audit quality. This difference is suspected to be caused by the low optimal use of technology in the respondents' organizations in the study. Thus, IT support depends not only on the availability of infrastructure, but also on user readiness, adequate training, and the digital culture of the organization.

Remote audit moderates the effect of auditor digital competence on audit quality, meaning that the existence of remote audit can strengthen the relationship between auditor digital capability and the resulting audit quality. In this context, auditor digital competence refers to the auditor's skills in operating audit software, using data analytics, and navigating the client company's digital systems. When the audit is conducted remotely, the auditor does not have physical access to the client's documents or work environment, so that dependence on digital systems becomes very high. Therefore, auditors with good digital competence will be better able to utilize technology to obtain adequate and relevant audit evidence, maintain effective communication with clients, and complete audits efficiently and accurately. Conversely, auditors with low digital competence tend to have difficulty adjusting to a virtual audit environment, which can ultimately reduce audit quality. Research by

Alma'aitah et al. (2024) and Li et al. (2023) found that remote audits affect audit quality. Thus, remote audits not only require the readiness of organizational technology but also emphasize the importance of developing auditor digital competence to maintain and improve audit quality in the digital era. Remote audits provide space for auditors to show the extent to which auditor digital capabilities can be optimized to maintain or even improve audit quality.

Remote audits do not moderate the effect of information technology support on audit quality, which means that the existence of remote audits does not strengthen or weaken the relationship between information technology (IT) support and audit quality. In this case, IT support such as digital accounting information systems, automated audit applications,

cloud computing, and other digital infrastructure have a direct effect on audit quality, regardless of whether the audit is conducted remotely or face-to-face. This means that as long as the organization has an adequate IT system, audit quality will remain high even though it is carried out remotely. These results support Utama and Anridho (2024), who state that strong and sophisticated IT infrastructure can improve financial reporting quality, accelerate collecting and processing audit evidence, and reduce the potential for material errors. Therefore, audit quality is more influenced by the readiness of internal technology than by the form of audit implementation (remote or face-to-face). Thus, remote audits function more as an alternative method of implementation, not as a factor that changes the essence of the relationship between IT support and audit quality.

CONCLUSION

This study aimed to examine the effects of auditor digital competence and information technology support on audit quality among external auditors at Big Four-affiliated firms in Malang City and determine whether remote audit moderates these relationships. The results show that both auditor digital competence and information technology support have a significant positive effect on audit quality, and that remote audit significantly strengthens the effect of auditor digital competence on audit quality but does not significantly moderate the effect of information technology support on audit quality. It can therefore be concluded that as auditing shifts toward remote execution, auditor digital competence becomes an increasingly decisive driver of audit quality, whereas the contribution of information technology support remains consistently important regardless of whether the audit is conducted on-site or remotely.

These findings suggest that auditor digital competence is particularly important when audits are conducted remotely, whereas information technology support contributes to audit quality more consistently across different audit settings. The findings contribute to the digital audit literature by highlighting the importance of aligning auditor capabilities with the mode of audit execution. Practically, Public Accounting Firms (KAP) should strengthen digital audit training, including audit analytics, audit software, cybersecurity, and remote audit tools, while maintaining adequate IT infrastructure to support audit activities.

For client organizations, secure, integrated, and accessible IT systems should be provided to facilitate auditors' access to relevant information, particularly in remote audit settings. Future researchers are encouraged to consider additional factors, such as cybersecurity readiness, organizational digital maturity, digital audit tool adoption, and other organizational characteristics, to provide a more comprehensive understanding of digital audit quality.

LIMITATIONS

This study is limited to public accounting firms (KAP) in Malang City, making the findings less generalizable to all types of industries, multinational companies, or government sectors with different technological standards and infrastructure.

ETHICS STATEMENT

This study was conducted in accordance with applicable research ethics principles. Participation was voluntary, and respondents were informed of the purpose of the study and the confidentiality of their responses.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to applicable confidentiality and privacy considerations.

FUNDING STATEMENT

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest related to this research or its publication.

AI USE DECLARATION

Artificial intelligence tools were used only to assist with language editing, grammar improvement, and manuscript refinement. The authors remain fully responsible for the content, analysis, interpretation, and conclusions presented in this manuscript.

AUTHOR CONTRIBUTIONS

Conceptualization: Oyong Lisa, Riza Bahtiar Sulistyan, Imanita Septian Rusdianti, Umi Muawanah, Djuni Farhan.

Data curation: Oyong Lisa, Riza Bahtiar Sulistyan, Imanita Septian Rusdianti, Umi Muawanah.

Formal analysis: Oyong Lisa, Riza Bahtiar Sulistyan, Imanita Septian Rusdianti, Umi Muawanah, Djuni Farhan.

Funding acquisition: Umi Muawanah, Djuni Farhan.

Investigation: Djuni Farhan.

Methodology: Oyong Lisa, Riza Bahtiar Sulistyan, Djuni Farhan.

Project administration: Imanita Septian Rusdianti, Umi Muawanah.

Resources: Oyong Lisa, Umi Muawanah, Djuni Farhan.

Software: Oyong Lisa, Imanita Septian Rusdianti, Djuni Farhan.

Supervision: Oyong Lisa, Imanita Septian Rusdianti.

Validation: Riza Bahtiar Sulistyan.

Visualization: Riza Bahtiar Sulistyan, Umi Muawanah, Djuni Farhan.

Writing – original draft: Oyong Lisa, Riza Bahtiar Sulistyan, Imanita Septian Rusdianti, Umi Muawanah, Djuni Farhan.

Writing – review & editing: Oyong Lisa, Riza Bahtiar Sulistyan, Imanita Septian Rusdianti, Umi Muawanah, Djuni Farhan.

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APPENDIX A. Research questionnaire

Respondent Demographics

1. Gender: ☐ Male ☐ Female
2. Age: ☐ 23-32 years ☐ 33-42 years ☐ 43-52 years
3. Highest education: ☐ Bachelor's degree (S1) ☐ Master's degree (S2) ☐ Doctoral (S3)
4. Public Accounting Firm: ☐ Deloitte ☐ EY ☐ KPMG ☐ PwC
5. Work experience: ☐ 2-7 years ☐ 8-14 years ☐ 15-21 years
6. Current position: ☐ Junior Auditor ☐ Senior Auditor ☐ Manager ☐ Senior Manager ☐ Partner

Main Questionnaire

Instructions: Please rate each statement using a 5-point Likert scale, where 1 = Strongly Disagree (STS), 2 = Disagree (TS), 3 = Neutral (N), 4 = Agree (S), and 5 = Strongly Agree (SS). Please tick (✓) the column that best reflects your response.

Auditor Digital Competence (X1)

No.	Statement	1	2	3	4	5
X1.1	I can operate computer-based audit software effectively in carrying out audit procedures					
X1.2	I have a good understanding of the client's accounting information system					
X1.3	I am skilled in processing and analyzing digital data to support audit testing					

Information Technology Support (X2)

No.	Statement	1	2	3	4	5
X2.1	The information technology infrastructure available at my workplace/client is adequate to support the audit process					
X2.2	Appropriate audit software is available to support my audit work					
X2.3	Information systems are well integrated into the audit process I carry out					
X2.4	The information technology system I use in the audit process is reliable					
X2.5	My organization utilizes cloud-based technology in the audit process					
X2.6	The information technology system I use is easy to operate					

Remote Audit (M)

No.	Statement	1	2	3	4	5
M1.1	I use virtual collaboration platforms (e.g., video conferencing, cloud-based file sharing) to carry out audit tasks remotely					
M1.2	I can access the client's systems and documents remotely					
M1.3	Online communication with clients during remote audits is effective					

Audit Quality (Y)

No.	Statement	1	2	3	4	5
Y1.1	I can complete audit assignments in a timely manner					
Y1.2	I obtain sufficient and appropriate audit evidence before forming an opinion					
Y1.3	I comply with applicable professional auditing standards					
Y1.4	I maintain objectivity and independence in forming audit opinions					