ELEVATING AUDIT JUDGMENT PERFORMANCE IN HIGHER EDUCATION: THE ROLE OF AUDITOR COMPETENCIES, TRUSTED DATA, TECHNOLOGY ANXIETY AND FRAUD RISK ASSESSMENT DURING DIGITAL TRANSFORMATION

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ABSTRACT

This study aims to explain the influence of auditor competence, data trusworthinesst, and technology anxiety on audit judgment performance, with fraud risk assessment as an intervening variable. This study was conducted on internal auditors in Indonesian higher education institutions. This study uses Behavioral Decision Theory (BDT) and Technology-to-Performance Chain (TPC) model to explore how behavioral and technological factors interact to shape the cognitive process in assessing fraud risk and producing high-quality audit judgments. This study uses a questionnaire-based survey approach administered to internal auditors across Indonesian higher education institutions, resulting in 158 respondents. The proposed hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the relationships between constructs. The findings indicate that auditor competence and data trust have a positive influence on audit judgment performance, both directly and indirectly through an effective incident risk assessment process. This indicates the importance of professional skills and reliable digital audit data in supporting appropriate audit decisions. In contrast, technology anxiety does not influence fraud risk assessment, indicating that internal auditors have largely adapted to the use of digital audit systems. This study contributes to the audit literature by integrating the BDT and TPC models in the context of higher education internal audit and provides practical insights for governance and policymakers in strengthening internal audit performance in the digital transformation process.

Keywords: *Audit judgment, Competencies, Data trustworthiness, Fraud risk assessment, Technology*

1.0 BACKGROUND

Corruption can impact all sectors, including higher education. There have been cases of personal interests and power struggle in higher education reported in the Brazilian and Philippine contexts (Apostol, 2022). The education sector has been categorized as high potential of the corruption of public resources by Corruption Eradication Commission (KPK) in Indonesia, including for driving some reform initiatives on higher education institution oversight and governance (Harahap & Isgiyarta, 2023).

From the perspective of organizational governance, internal audit is on the front line of defense against fraud. Internal auditors are expected to take a transformational role from watchdogs to partners contributing strategically towards enhancing governance and risk management (Nerantzidis et al., 2022; Volodina et al., 2023). The digital transformation has also increased the value of internal audit in higher education. Integrated information systems are currently an important resource for higher education institutions. It is evident that using audit analytical facilitates greater audit efficiency and can increase the scope of testing by as much as 30% (Saud et al., 2025). However, the UK's National Audit Office (2024) has warned that poor data quality can cause major audit failures.

This demands that internal auditors have an appropriate level of digital competence, which will enable them to access, analyse and evaluate IT risks (Gao et al., 2021; Noor, 2022). But having technical skills is not enough. The reliability of the data, accuracy, completeness, consistency and timeliness form the initial foundation for reliable audit conclusions (ISACA 2023). Unreliable information has been demonstrated to bias the fraud risk assessment and mislead auditors' judgment (Frank, 2022). The COSO (2013) framework have emphasis on the significance of IT controls, continuous verification of data and digital audit trails to ensure the quality of evidence. In higher education institutions, internal auditors are typically academics who have the other job as internal auditor. Such a condition brings work role conflict, low workload pressure, and time constraints, especially during peak periods (Ngo et al., 2023). Additionally, fear of technology is still a barrier to the effective use of digital audit tools, especially among senior auditors.

Fraud risk assessment serves as a crucial link between audit evidence collection and the quality of auditor judgment. The Institute of Internal Auditors (IIA, 2024) recommends conducting a fraud risk assessment (FRA) during the audit planning stage. Although behavioral accounting literature indicates that auditor competence and data quality positively influence FRA and audit judgment performance (Nalukenge et al., 2022), most research focuses on external auditors or local government institutions (Zakwan et al., 2024). Research that simultaneously examines auditor competence, data trustworthiness, technology anxiety, FRA, and audit judgment performance in the context of internal auditors in higher education institutions is still limited. To fill this gap, this study integrates Behavioral Decision Theory (Hogarth, 1992) and the Technology-to-Performance Chain model (Goodhue & Thompson, 1995) to analyze how behavioral and technological factors interact to influence the audit judgment performance of internal auditors in higher education institutions in Indonesia in the era of digital transformation.

2.0 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Audit Judgment Performance

Audit judgment performance (AJP) has evolved over time. A study by Pratt and Van Peursem (1996) confirmed that AJP is the auditor's ability to apply professional judgment to reliably assess risk and materiality, not simply following audit procedures. Furthermore, Bonner (1999) emphasized the cognitive aspect of audit judgment, where judgment is viewed as a mental activity that forms opinions and forms the basis for predicting future events. Solomon and Trotman (2003) deepen it by pointing out that once an assessment is made, the auditor must make a decision about the evidence collected and the opinions published.

The experimental approach of Mohd-Sanusi and Mohd-Iskandar (2007) measured AJP through the accuracy-consistency of vignette responses and found that incentives increased AJP on simple tasks, but the effect faded when complexity was high. Ashton (2010) classifies this research as the study of human behavior in accounting. In 2011, Trotman et al. emphasized the influence of the judgment-decision process on auditor behavior, while began to discuss the implications of big data for audits. Moffitt and Vasarhelyi (2013) then emphasize

that the era of massive data demands that auditors adapt to advanced analytical tools, and Brown-Liburd et al. (2015) show how such analytics increase professional skepticism. Motivational and ethical factors are the next focus. Mohd-Sanusi et al. (2018) found that goal orientation and self-efficacy strengthen AJP, while Nugrahanti and Jahja (2018) showed that high ethical perception can neutralize obedience pressure.

2.2 Fraud Risk Assessment

Fraud risk assessment is an essential aspect of audit planning as it enables auditors to recognize likely fraud schemes and develop relevant substantive procedures. It is the responsibility of auditors to evaluate the possibility of material misstatements arising from fraud and vulnerabilities in financial report components and other company operations. Any risk assessment conducted should focus on industry and individual behaviors as well as an aim of mitigating the financial losses (Alon & Dwyer, 2010). Prior research indicates that decision-aid tools and risk decomposition strategies enhance auditor sensitivity to fraud indicators as well as audit judgment quality (Wilks & Zimbelman, 2004; Trotman & Wright, 2012).

2.3 Auditor Competencies

In the government sector, auditors are expected to learn not only basic accounting knowledge but also skills in using technology and data analysis techniques (IFAC, 2022). Here are some key points regarding digital auditor competencies:

1. Technology-related Technical Competence
Technical competencies include an understanding of computer-based audit tools, information system architecture, and automated audit techniques. The digitalization of the public sector through e-Government increases data complexity, so the use of CAATs and analytical tools enables auditors to evaluate IT controls, analyze large-scale data, detect anomalies, and identify potential fraud more effectively (Noor, 2022; Frank, 2022; Saud et al., 2025).

2. Analytical Competence in Processing Big Data
Analytical capabilities enable auditors to process large government data sets through data processing and statistical analysis to identify patterns, correlations, and anomalies (Gao et al., 2021; Sanusi et al., 2023). The same is true for data visualisation skills, which are increasingly becoming part of the auditor's toolkit thanks to their many benefits, such as the fact that the use of data analytic solutions like Tableau, Power BI or Excel allows auditors to present the next steps of their analysis in a way that anyone among their stakeholders can in just one look read and interpret their findings, allowing for better communication and data-driven decisions (Deloitte, 2018). Moreover, besides domain knowledge, auditors also need critical thinking to invent audit hypotheses, interpret evidence, and arrive at appropriate conclusions. This skill is extremely helpful in warning of the potential for fraud, waste and abuse of allocated resources in the public sector (Noor et al., 2023).

3. Digital Ethics Competence
Digital ethics competence is particularly important in this field because auditors often handle sensitive data with a high public interest impact (COSO, 2013). It has a few important components. First, privacy and data security awareness is the knowledge of data protection laws and steps to ensure that audit functions are not infringing on the confidentiality of information (Deloitte, 2018). Second is independence and objectivity, in which auditors must be free from algorithmic bias and neutrality when utilizing the technology throughout audit processes (Frank, 2022). Thirdly, the integrity of the use of technology, which represents auditors, must comply with professional standards and ethical codes when accessing data and reporting audit results transparently and accurately (Sanusi et al., 2023). This competence

builds public trust in audit results and maintains the reputation of the auditor institution in the digital era.

2.4 Data Trustworthiness

As audits increasingly rely on information technology and data analytics, data trustworthiness is becoming an increasingly crucial factor (Frank, 2022). Referring to the Trustworthy AI Framework (Sanusi et al., 2023), reliable audit data must meet six key principles: fairness and unbiasedness, transparency and explainability, responsibility and accountability, reliability and robustness, respect for privacy, and security and protection. Implementing these principles supports audit quality, maintains the integrity of the decision-making process, and strengthens public trust in public sector governance.

The above dimensions help assess the quality of data more holistically. It is important to note that if any of the dimensions are overlooked, data may be less reliable and result in misinterpretation of the audit (Deloitte, 2018). In digital auditing, the quality of analyses, decision making and financial reporting is strongly related to data reliability. Some of these include aspects such as information systems and IT infrastructure, data governance, organisational culture, and internal control procedures, which directly impact data quality issues in the public sector. In this way, how data is entered, processed, and stored depends on the quality of the hardware, software, network, and the architecture design of the information system.

The impact of data unreliability during audits can be major. Public policy errors such as misallocating budgets and reducing government programmes' effect can occur due to invalid data. Moreover, data errors may lower public confidence in audit outcomes and the credibility of government institutions (Frank, 2022). That is through applications like Computer Assisted Audit Tools (CAATs) that one could automate the time-consuming process of normality checks with accuracy testing for large dataset analysis and only done by big data analytics (Deloitte, 2018).

Data-driven audits are trustworthy, leading to more developed recommendations and help increase the transparency and the efficiency of the state financial management. Reliability data facilitates performance tracking at their agencies, reducing the likelihood of deviant behaviour manifesting at early stages (Sanusi et al., 2023). By adopting a comprehensive framework across its data governance, internal control and auditor competence (Frank, 2022; COSO, 2013), the public sector can also contribute to better accountability and public trust.

2.5 Technology Anxiety

Technology anxiety is the fear or nervousness of having to use a new device, application, or digital system. This phenomenon was first recorded as computer anxiety in the 1990s (Rosen & Weil, 1995). Now its scope extends to social media and artificial intelligence (Maier et al., 2015). To measure this quickly, Wilson et al. (2022) created the Abbreviated Technology Anxiety Scale (ATAS) a ten-question questionnaire that assesses two things: how uncomfortable a person is with technology and how likely they are to avoid it. Research shows that technology anxiety is not the same for everyone. The 21-30-year-old age group is the most anxious, and women generally feel more depressed than men (Hsieh et al., 2020). For the elderly, physical limitations plus the fear of "damaged" devices make them reluctant to transact online (Kim et al., 2023). On the other hand, technology can help for example, a foreign language app that provides self-practice has been shown to reduce nervousness when speaking in a new language, as long as the interface is easy to use (Aydın, 2018).

In the workplace, technology can also be a source of stress. Auditors in Nigeria report technostress due to the demands of real-time reporting and complex software (Agboola &

Olasanmi, 2016). Bibliometric studies map three major trends in auditing: continuous auditing, audit-specific software, and information systems (Lamboglia et al., 2021). Auditors are willing to use the new tool if there is IT support, they find it useful, and it is easy to operate (Afsay et al., 2023). But recent research adds another challenge: anxiety over artificial intelligence being a "black box" and the complexity of blockchain (Abu Huson et al., 2024).

2.6 The Effect of Auditor Competencies, Data Trustworthiness, and Technology Anxiety on Audit Judgment Performance

Digital transformation has also enhanced the role of internal audit in higher education. Higher education institutions now rely heavily on integrated information systems. The use of audit analytics tools has been shown to improve audit efficiency and extend testing coverage by up to 30 percent (Saud et al., 2025). However, a report from the UK's National Audit Office (2024) warned that poor data quality can lead to significant audit failures, including disclaimers of opinions on public sector financial statements. This emphasizes that data reliability is a key prerequisite for technology-based audits.
H1a: Auditor competencies has a positive effect on audit judgment performance

Data trustworthiness refers to auditors' perceptions of the accuracy, completeness, reliability, timeliness, and freedom from manipulation of data. Trustworthy data reduces information uncertainty and auditors' cognitive load, thus supporting more objective risk assessments. This is consistent with Behavioral Decision-Making Theory. Within the Technology-to-Performance (TPC) Chain framework, data trustworthiness is a key technological characteristic that ensures reliable analytical data (Christensen et al., 2022; Sihombing et al., 2023). Conversely, low data quality encourages the use of intuition and repetitive verification procedures, especially under complex conditions and time pressure (Hamdam et al., 2021; Holt & Loraas, 2021). Recent research has shown that trustworthy digital audit systems improve auditor performance and judgment quality (Sanusi et al., 2023; Sofyani et al., 2025).
H1b: Data Trustworthiness has a positive effect on audit judgment performance.

Technology anxiety is a major psychological barrier to digital auditing, characterized by fear and discomfort when using technology. Auditors with high levels of anxiety tend to avoid using digital audit tools, thereby reducing the quality of risk assessments and the accuracy of audit judgments (Iskandar & Sanusi, 2011; Sanusi et al., 2007). This condition is common in public institutions, especially among auditors with non-technical backgrounds.
H1c: Technology Anxiety has a negative effect on audit judgment performance.

2.7 The Effect of Auditor Competencies, Data Trustworthiness, and Technology Anxiety on Fraud Risk Assessment

In audit practice, fraud risk assessment (FRA) is a crucial stage that relies heavily on auditor competence. Based on Behavioral Decision-Making Theory, auditor decision-making is influenced by cognitive capacity, experience, and task complexity. Auditors with high competence tend to be able to reduce decision-making bias and produce more accurate risk assessments. Previous research has shown that auditor competence increases sensitivity to fraud indications and enhances the quality of FRA, particularly in technology-based audit environments (Fikriyah & Kuntadi, 2024; Ridzuan et al., 2020; Pramano et al., 2023).
H2a: Auditor competence has a positive effect on Fraud Risk Assessment

Recent research emphasizes the importance of data trustworthiness in fraud risk assessment, as data quality dimensions such as timeliness, coherence, and reliability are vulnerable to fraudulent elements (Brahimi & Elhussein, 2023). Various frameworks, such as blockchain and adaptive transaction validation, have been developed to improve data reliability. In addition to auditors' understanding of the business environment (Kassem, 2021),

the use of digital technology and big data analytics has been shown to increase the effectiveness of fraud detection, although challenges remain in standardizing data reliability (Ridzuan et al., 2020; Cheng et al., 2021).
H2b: Data Trustworthiness has a positive effect on Fraud Risk Assessment

In auditing, technology anxiety negatively impacts the effectiveness of fraud risk assessments because auditors tend to avoid or make less optimal use of digital audit tools, big data analytics, and decision support systems (Ridzuan et al., 2020). Other research shows that technology anxiety also influences technology adoption intentions in academic and organizational settings (Gunasinghe & Nanayakkara, 2021). Therefore, high levels of technology anxiety have the potential to reduce the quality of auditors' fraud risk assessments and need to be systematically measured and managed, for example through instruments such as the Abbreviated Technology Anxiety Scale (Wilson et al., 2022).
H2c: Technology anxiety has a negative effect on the effectiveness of auditor fraud risk assessment.

2.8 The Effect of Fraud Risk Assessment on Audit Judgment Performance

Fraud risk assessment affects the quality of audit decisions, but according to Behavioral Decision Theory, auditors can experience bias, heuristics, and decreased scepticism due to cognitive pressure and risk perception (Rose & Rose, 2003; Payne & Ramsay, 2005). Studies also show that strategies such as providing forensic priming (i.e. encouraging auditors to think like fraud investigators) can increase auditors' sensitivity to fraud risks (Chui et al., 2021). Similarly, the use of a decomposition approach in assessing risk (breaking down risk into small components) has been shown to make auditors more observant in recognizing signs of fraud compared to traditional approaches (Fortvingler & Szívós, 2016). However, even if risk assessments are conducted accurately, auditors do not always obtain better performance assessments if cheating is not detected which can reduce motivation to conduct in-depth assessments. The more accurate and systematic the auditor is in assessing the risk of fraud, the better the quality of the audit decisions taken. A good risk assessment helps auditors focus audit procedures on high-risk areas, increases professional scepticism, and reduces the likelihood of cognitive bias in the judgment process. This is in accordance with the framework of Behavioral Decision Theory which explains that decision-making can be improved through proper evaluation structures and management of psychological factors.
H3: Fraud Risk Assessment has a positive effect on Audit Judgment Performance.

2.9 The Mediating Effect of Fraud Risk Assessment on the Relationship Between Auditor Competencies, Data Trustworthiness, and Technology Anxiety and Audit Judgment Performance

Fraud risk assessment is very important for enhancing the auditing quality on both initial stage and also as mediating variable of individual, technological, psychological factors to audit findings (Adnan & Kiswanto, 2018). Subsequent studies offered evidence that both professional skepticism and audit data reliability increase accuracy in risk assessment and effectiveness in fraud detection, and the introduction of time pressure and conflicting evidence can impede audit decision quality (Putri, 2021; Cefaratti & Bhattacharjee, 2013). Pramano (2023), Dadek Nandemar et al., 2024; Noor et al. (2024) also show that fraud risk assessment as mediating continuously works in explaining the effects of auditor competences, digital technology skills, and digital audit systems to the judgment performance and audit effectiveness. Furthermore, the presentation of fraud issues in the auditor's mind has been accepted as a mediator between knowledge and performance of fraud risk assessment tasks (Popoola et al., 2014). These results suggest that to enhance audit judgment quality, the fraud risk assessment process should be reciprocally influenced by competence, technology, psychology and auditor professional behavior.

H4a: Fraud Risk Assessment mediates the influence of Auditor Competence on Audit Judgment Performance.

H4b: Fraud Risk Assessment mediates the influence of Data Trustworthiness on Audit Judgment Performance.

H4c: Fraud Risk Assessment mediates the influence of Technology Anxiety on Audit Judgment Performance.

2.10 The Moderating Effect of Technology Anxiety on Fraud Risk Assessment

This research departs from the assumption that auditor competence and trust in data (data trustworthiness) are two important factors that are consistently found to increase the effectiveness of fraud risk assessment (FRA). Auditors who are technically and professionally competent are generally more accurate in assessing the risk of fraud because they are able to interpret evidence and choose the right audit procedures. However, Behavioral Decision Theory (BDT) emphasizes that auditors' decisions are not only driven by cognitive capacity, but also by affective conditions. When auditors experience anxiety about technology, they tend to avoid or less optimally use digital audit tools, so their competency advantages are not fully realized. Thus, the positive effect of auditor competence on fraud risk assessment (FRA) is estimated to weaken in auditors with a high level of technological anxiety.

Data reliability (data trustworthiness) is also an important cornerstone of FRA; auditors adjust risk assessments significantly when receiving conflicting evidence, signaling a high sensitivity to data quality (Cefaratti & Bhattacharjee, 2013). However, according to the task-technology fit framework in the TPC, quality data only improves performance if auditors are able to utilize the technology that presents the data. Auditors who are overwhelmed by technology anxiety may not be confident in extracting, verifying, or analyzing digital data (Ridzuan et al., 2020), so the positive influence of data trustworthiness on FRA is reduced.

H5a: The influence of auditor competence on fraud risk assessment will be reduced if the auditor has a high level of anxiety about technology.

H5b: The effect of trust in data on fraud risk assessment will weaken when auditors have high anxiety about technology.

3.0 METHODS

3.1 Questionnaire design

The questionnaire has structured questions requiring respondents to select a response from a predetermined range of possibilities. Responses to individual items on a structured questionnaire will thereafter be aggregated into a composite scale or index for statistical analysis. The survey questionnaire in this study was formulated as a self-administered instrument, requiring respondents to read, comprehend, and answer independently without assistance. All elements in the questionnaire are assessed at the individual level, reflecting the respondent's capabilities rather than the organization's perspective.

3.2 Variable measurements

The constructs were operationalized using a Likert scale, and a common approach was used to measure latent constructs. In this study, a seven-point Likert scale was used for the dependent and independent variables, ranging from 1 (strongly disagree) to 7 (strongly agree), except for one variable that used 1 (very low) to 7 (very high).

It has been referred to as an auditor's ability to make professional, fair judgments about financial statements by evaluating evidence (Bonner 1999). In our research, we drew on a task-based performance approach that has been applied successfully in behavioral audit

research (Bonner 1999; Mohd-Sanusi et al., 2015) to measure audit judgment performance.6 We used six realistic cases that employees of internal audit departments were likely encounter: revenue recognition, student receivables, procurement, fixed assets, expenditure cut-offs and financial system migration. Fraud risk assessment (FRA) refers to a structured approach of assessing the risk of material misstatement due to fraud, and it is used as a basis for planning and executing an audit. The ability aspect of assessing fraud risk dimension refers to thinking abilities (Kiswanto and Maulana, 2019) are concept being adopted from Fraud Diamond theory (Wolfe & Hermanson, 2004).

Competency of auditors is characteristics related to the knowledge, experience, education and personality in obtaining effective business process in accordance with International Education Standards (Ies 1-7), which focuses on technical skills and professional values (Kim et al., 2016; IFAC). Auditor Competency Instrument The auditor competency instrument of this study was adopted from Noor (2022) and include three indicators such as knowledge, technical skill and ethical competency. The trustworthiness of data is the accuracy, completeness, and consistency at which audit data can be thought to reflect what it claims, the timeliness with which it is available, its assurance (transparency), and its security; all these render the data to be reliable for supporting objective auditing decision-making process (Frank, 2022; Sanusi et al., 2023)Technology anxiety describes auditors' fear or discomfort in using digital audit technologies, such as CAATs and data analytics, which can hinder technology utilization and reduce the quality of audit judgments (Hamdam et al., 2022; Leocádio et al., 2024). These measurements reflect the extent to which auditors feel unconfident, depressed, or reluctant to leverage technology in the fraud risk assessment and audit decision-making process, especially in an increasingly digitized work environment.

3.4 Data collection

Data was collected through the distribution of online questionnaires to the internal audit units of higher education in Indonesia. The targeted professional forum consisted of official internal auditors who are members of the internal control unit or internal audit department of higher education institutions. Because there is no centralized database that contains the entire population of chief audit executives, supervisors, and internal auditors in the internal control unit of higher education, the researcher applied a non-probability sampling method with the snowball sampling technique. The questionnaire link was shared with members of a social media group of internal auditors from public institutions. At the end of the data collection period, 158 questionnaires were collected that met the validity criteria and were ready for further analysis.

3.5 Models and Data Analysis

The data analysis used in this study is the Partial Least Square (PLS) approach. PLS is a component or variant-based Structural Equation Modeling (SEM) model. PLS is an alternative approach that shifts from a covariance-based SEM approach to a variant-based approach (Ghozali and Latan, 2015).

4.0 RESULTS

4.1 Profile of the respondents' characteristics

Table 1 shows the demographic profile of the respondents in this study. The majority of respondents were in the age range of 30–39 years (48.7%), followed by the age groups of 40–49 years (20.9%) and 50–60 years (17.1%). The youngest respondents aged 20–29, accounted for 13.3% of the total sample. In terms of gender, the majority of respondents are women (55%), while the rest are men (45%). In terms of areas of expertise, most internal

auditors at higher education have a background in accounting (44%) and auditing (39%). The rest have competencies in the fields of risk management (5%), law and taxation (6%), state finance (2%), and system analysis (5%). The level of professionalism of internal auditors is reflected in the possession of competency certification. A total of 71% of respondents had 1–3 types of certifications, 10.1% had 3–5 certifications, and 8.2% had more than five certifications. Only 10.8% of respondents do not have formal certification. These findings show that the majority of internal auditors in higher education have been equipped with relevant technical expertise and support quality audit performance.

Table 1. Profile of the respondents' characteristics

Categories	Quantity	n	%
Gender	Men	71	45
	Women	87	55
Age	20–29	21	13
	30–39	77	49
	40–49	33	21
	50–60	27	17
Number of Competency Certifications	1–3 types of certifications	112	71
	3–5 types of certifications	16	10
	>5 certifications	13	8
	Without certification	17	11

4.2 Analysis and results

The factor loading analysis (Table 1) shows that all indicators in each variable have a factor load value above 0.70. This indicates that each question item is valid convergently in measuring the construct in question. In addition, the entire value of the Variance Inflation Factor (VIF) is below 5, which means that there are no symptoms of multicollinearity between indicators in the construct. Thus, the indicators in this study are considered feasible for use in further structural model testing.

Table 2. Factor Loading Analysis

Construct	Item	Factor Loading	VIF
Fraud Risk Assessment (FRA)	FRA1	0.854	2.108
	FRA2	0.871	2.321
	FRA3	0.903	2.676
	FRA4	0.888	2.451
Auditor Competencies (AC)	AC1	0.814	1.987
	AC2	0.832	2.104
	AC3	0.845	2.198
	AC4	0.871	2.567
Data Trustworthiness (DT)	DT1	0.810	2.041
	DT2	0.827	2.201
	DT3	0.844	2.324
	DT4	0.801	1.967
	DT5	0.856	2.417
	DT6	0.879	2.689
	DT7	0.867	2.524
	DT8	0.884	2.735
	DT9	0.891	2.814
	DT10	0.861	2.468
	DT11	0.872	2.519
	DT12	0.894	2.783
	DT13	0.913	2.927

	DT14	0.898	2.769
	DT15	0.901	2.821
	DT16	0.875	2.582
	DT17	0.860	2.406
	DT18	0.883	2.694
	DT19	0.867	2.501
Technology Anxiety (TA)	TA1	0.798	1.856
	TA2	0.836	2.104
	TA3	0.857	2.243
	TA4	0.844	2.174
Audit Judgment Performance (AJP)	AJP	1	-

Furthermore, the results of the construct reliability and validity test shown in Table 3 show that the entire construct has Cronbach's Alpha and Composite Reliability values above 0.85, which indicates excellent internal consistency. Average Variance Extracted (AVE) value for all four constructs was also above 0.70, indicating that each construct had a strong convergent validity. This indicates that the constructs of Auditor Competence, Data Trustworthiness, Technology Anxiety, and Fraud Risk Assessment (FRA) are reliable and valid in explaining the variables being studied.

Table 3. Analysis of construct reliability and validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
Fraud Risk Assessment	0.891	0.920	0.742
Auditor Competencies	0.876	0.907	0.709
Data Trustworthiness	0.968	0.973	0.783
Technology Anxiety	0.857	0.895	0.681

The validity of discriminators between constructs is tested using the Heterotrait-Monotrait ratio (HTMT) as presented in Table 4. The results showed that the entire HTMT value was below the threshold of 0.90, according to the criteria from Henseler et al. (2015). This indicates that each construct in the model is unique and does not overlap.

Table 4. Heterotrait-monotrait ratio of correlations (HTMT)

Construct	FRA	AC	DT	TA
Fraud Risk Assessment (FRA)	–			
Auditor Competencies (AC)	0.652	–		
Data Trustworthiness (DT)	0.688	0.703	–	
Technology Anxiety (TA)	0.509	0.542	0.581	–

Table 5. Summary of the structural model assessment

Hypo	Relationship	Path Coefficient	Std. Error	t-value	p-value	Inference	Effect Size (f^2)
H1a	AC → AJP	0.311	0.074	4.203	0.000	Supported	0.152
H1b	DT → AJP	0.288	0.071	4.056	0.000	Supported	0.141
H1c	TA → AJP	-0.066	0.070	0.943	0.173	Not supported	0.007
H2a	AC → FRA	0.423	0.068	6.221	0.000	Supported	0.204
H2b	DT → FRA	0.452	0.065	6.954	0.000	Supported	0.217
H2c	TA → FRA	-0.072	0.072	1.000	0.159	Not supported	0.010
H3	FRA → AJP	0.487	0.062	7.855	0.000	Supported	0.268

H4a	AC → FRA → AJP	0.206	0.060	3.433	0.001	Partial mediation (complementary)	–
H4b	DT → FRA → AJP	0.220	0.058	3.793	0.000	Partial mediation (complementary)	–
H4c	TA → FRA → AJP	-0.035	0.048	0.729	0.233	Not supported	–
H5a	AC × TA → FRA	-0.049	0.061	0.803	0.211	Not supported	0.009
H5b	DT × TA → FRA	-0.058	0.066	0.879	0.190	Not supported	0.011

The results of this study show that auditor competence (AC) and trust in data (data trustworthiness / DT) have a significant effect on audit performance (audit judgment performance / AJP), both directly and through fraud risk assessment (FRA) as mediators. These findings reinforce the role of competence as a key cognitive resource in the decision-making process, as described in Behavioral Decision Theory (BDT), which states that individuals with professional expertise and knowledge are better able to assess risks and make rational audit decisions. In particular, the direct relationship between AC → AJP and DT → AJP proved to be significant, which means that auditors who are competent and use credible data tend to produce better audit judgments.

However, different results were found in the technology anxiety (TA) variable. Neither the direct relationship between TA → AJP nor TA → FRA was statistically significant. In addition, TA also does not mediate the relationship between TA → FRA → AJP, nor does it moderate the relationship between AC or DT and FRA. This shows that anxiety about technology is no longer a relevant factor in influencing the effectiveness of risk assessment and audit judgment. These findings strengthen the argument that the digital transformation in the internal auditor environment of higher education has been going quite well, where most auditors have adapted to audit technology systems. Descriptive statistical data support this, showing that the majority of respondents are in the productive age range (30–39 years), have a strong educational background and experience, and have had 1–3 types of professional certifications. An R^2 value of approximately 0.586 for the Fraud Risk Assessment (FRA) construct indicates that the predictor variables in the model explain about 58.6% of the variance in FRA. In the context of PLS-SEM, this value is classified as moderate to substantial, suggesting that the model demonstrates adequate predictive capability in explaining the fraud risk assessment process of internal higher education auditors. Furthermore, an R^2 value of approximately 0.861 for the Audit Judgment Performance (AJP) construct indicates very strong (substantial) explanatory power.

5.0 DISCUSSION AND CONCLUSION

5.1 Discussion

This study makes a useful contribution for FRA and AJP of internal auditors in Indonesia. The findings indicate that the auditor capability, data trustworthiness are important in constructing dependable and credible fraud risk-based audit model while technology anxiety is not such an issue in digital audit period. There is an improvement from moderate to average indicating that the perception of the internal auditor conforms when it relates to computerized audit system and technology. In particular, this research verifies that auditor quality contributes to FRA in a positive and statistically significant manner. It is assumed that when auditors have high levels of expertise, they are more likely to be able to effectively identify, evaluate and systematically assess fraud risks. This finding is in line with Bierstaker et al. (2014) emphasizing the impact of training and specialization in face of audit complexity, and Nelson (2009) that points out the auditor knowledge level and its expertise are related to detect signs of fraud. In terms of Behavioral Decision Theory, auditor competency is essentially cognitive capital that determines how auditors process information and make risk-based judgments, especially in time-critical and complex task environment.

Furthermore, data trustworthiness has been shown to have a positive impact on FRA. Auditors with a higher level of confidence in conducting risk assessments also infer that audit data is accurate, valid and complete. In the Technology-to-Performance Chain model, data credence attributes are a measure of the fit between technology, tasks, and users, with higher scores corresponding to more accurate and better quality audit assessments for institutions of higher education utilizing an integrated information system.

In contrast to initial expectations, this study found that anxiety about technology had no significant effect on FRA. These results are in contrast to the findings of Maier et al. (2015) and Wilson et al. (2022) which show that technology anxiety can hinder the use of digital systems in the audit process. However, in the context of this study, the TA variable had a low and insignificant coefficient, as well as a very small effect value (f^2). These findings reflect that internal auditors in higher education have been able to adapt to the available digital audit technology. This is supported by descriptive data, where the majority of respondents are 30–39 years old (48.7%) and are familiar with digital audit applications. Within the framework of TPC, if technology is in accordance with the needs of the task and has been internalized in the auditor's work process, then psychological barriers such as anxiety about technology no longer have a significant influence on audit performance. On the other hand, Cheng et al. (2023) state that the adoption of technology supported by training and clarity of procedures can reduce the negative effects of technology anxiety.

Furthermore, FRA has been proven to have a strong and significant influence on audit judgment performance. The FRA → AJP pathway coefficient of 0.611 with high significance indicates that FRA plays a key factor in forming an objective and evidence-based judgment. These findings are in line with the studies of Rose and Rose (2003) and Hamdan et al. (2021) which stated that a thorough FRA will encourage auditors to deepen the evaluation of evidence and minimize the possibility of misjudgement. FRA is also a means to reduce bias in decision-making by directing auditors to focus on high-risk areas. In audit practices in higher education, such as auditing scholarships, procurement, and use of research funds, the role of the FRA is strategic to determine proportionate and accountable audit steps. In terms of mediation, this study also proves that FRA partially mediates the influence of auditor competence and trust in data on audit judgment performance. This shows that these two variables not only affect judgment performance directly, but also indirectly through increasing the effectiveness of fraud risk assessment.

5.2 Conclusions and Future Research

The results of this study show that auditor competence and trust in data significantly improve the quality of fraud risk assessment (FRA) and indirectly improve audit judgment performance (AJP). On the other hand, technology anxiety was not shown to have a significant effect on FRA, nor did it moderate the relationship between competence and data trust to FRA. In theory, FRA is primarily a mediating mechanism between auditor expertise and perception of data or information reliability and the quality of audit decisions, especially under high-stakes environments. Practically, the results underline the crucial role of auditor skill building, audit data reliability and risk-based and digital training in strengthening audit quality and governance at HEIs. However, this study has limitations. The research model used only emphasizes individual factors, particularly personal competence, perception of data, and technology anxiety, without considering organizational factors, such as the effectiveness of the internal audit system, the role of leadership, or alignment with institutional performance targets and applicable audit standards. Therefore, further research needs to expand its scope by including institutional variables, such as management support, organizational culture, and the role of supervision and compliance with higher education policies.

In addition, this study is cross-sectional, that is, data collection is carried out at one point in time, so it has not been able to explain changes or dynamics of variables over time. To gain a deeper understanding, longitudinal research is recommended to explore the long-term effects of competence, data trust, and technology use on the quality of risk assessment and audit judgment. Experimental research can also be used to test causally how FRA mediates relationships between these variables more precisely. In the future, follow-up studies may also test this model in the context of other public organizations, or compare education sector auditors with other government sectors, to broaden the generalization of findings.

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CO-AUTHOR CONTRIBUTION

The authors affirmed that there is no conflict of interest in this article. Author 1 carried out the fieldwork, prepared the literature review and overlook the write-up of the whole article. Author 2 wrote the research methodology and did the data entry. Author 3 carried out the statistical analysis and interpretation of the results.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

This work was prepared using Grammarly and Chat-GPT to improve language clarity, coherence, and readability. These tools were used solely to assist in editing and refining the text, and the author(s) take full responsibility for the content, interpretation, and conclusions of the publication.

REFERENCES

Abu Huson, Y., Sierra-García, L., & García-Benau, M. A. (2024). A bibliometric review of information technology, artificial intelligence, and blockchain on auditing. *Total Quality Management & Business Excellence, 35*(1–2), 91–113.

Adnan, J., & Kiswanto. (2018). Determinant of Auditor ability to detect fraud with professional scepticism as a mediator variable. *Accounting Analysis Journal,6* (3), 313-326.

Afsay, A., Tahriri, A., & Rezaee, Z. (2023). A meta-analysis of factors affecting acceptance of information technology in auditing. *International Journal of Accounting Information Systems, 49*, 100608. https://doi.org/10.1016/j.accinf.2022.100608

Agboola, A. A., & Olasanmi, O. O. (2016). Technostress among auditing professionals in developing countries. *Open Journal of Applied Sciences, 6*(4), 248–259. https://doi.org/10.4236/ojapps.2016.64025

Alon, A., & Dwyer, P. (2010). The impact of groups and decision aid reliance on fraud risk assessment. *Management Research Review, 33*(3), 240–256. https://doi.org/10.1108/01409171011030390

Apostol, O. (2022). Accounting for anticorruption: Where are the social and environmental accounting scholars? *Social and Environmental Accountability Journal, 42*(3), 220–246. https://doi.org/10.1080/0969160X.2022.2146151

Ashton, R. H. (2010). Judgment and decision-making research in accounting and auditing: Past, present, and future. In *Research on Professional Responsibility and Ethics in Accounting,14*, 1–26.

Aydın, S. (2018). Technology and foreign language anxiety: Implications for practice and future research. *Journal of Language and Linguistic Studies, 14*(2), 193–211.

Bonner, S. E. (1999). Judgment and decision-making research in accounting. *Accounting Horizons, 13*(4), 385–398.

Brown-Liburd, H., Issa, H., & Lowe, D. J. (2015). Enhancing professional skepticism via big data analytics: A framework. *Accounting Horizons, 29*(2), 451–468. https://doi.org/10.2308/acch-51069

Cefaratti, M., & Bhattacharjee, S. (2013). Assessing Fraud risk, trustworthiness, reliability, and truthfulness: Integrating audit evidence from multiple sources.

Christensen, B. E., Glover, S. M., & Wood, D. A. (2022). The effects of vivid data visualizations on auditor judgment and litigation risk. *Accounting Horizons*. https://doi.org/10.2308/acch-52899

Chui, L. (2010). *An experimental examination of the effects of fraud specialist and audit mindsets on fraud risk assessments and on the development of fraud-related problem representations* [Doctoral Dissertation,University of North Texas].

Edwards, W. (1961). Behavioral decision theory. *Annual Review of Psychology, 12*, 473–498. https://doi.org/10.1146/annurev.ps.12.020161.002353

Fikriyah, N. H., & Kuntadi, C. (2024). Pengaruh kemampuan auditor dalam mendeteksi fraud: Kompetensi, profesionalisme, dan pengalaman audit. *Jurnal Ilmiah Ekonomi, Akuntansi, dan Pajak, 1*(2), 39–52. https://doi.org/10.61132/jieap.v1i2.93

Fortvingler, J., & Szívós, L. (2016). Different approaches to fraud risk assessment and their implications on audit planning. P*eriodica Polytechnica Social and Management Sciences, 24*(2),102–112. https://doi.org/10.3311/PPso.8436

Frank, L. (2022). Data reliability challenges in technology-enabled auditing. *Auditing: A Journal of Practice & Theory, 41*(4), 75–100. https://doi.org/10.2308/AJPT-2020-079

Gao, R., Huang, S., & Wang,R. (2021). *Data analytics and audit quality*.

Goodhue, D. L., & Thompson, R. L. (1995). Task–technology fit and individual performance. *MIS Quarterly, 19*(2), 213–236. https://doi.org/10.2307/249689

Hamdam, A., Jusoh, R., Yahya, Y., Abdul Jalil, A., & Zainal Abidin, N. H. (2022). Auditor judgment and decision-making in big data environment: A proposed research framework. *Accounting Research Journal, 35*(1), 55–70. https://doi.org/10.1108/ARJ-04-2020-0078

Harahap, L., & Isgiyarta, J. (2023). Corruption and fraudulent activities in higher education: A study of literature. *Jurnal Manajemen*, 217-237.

Holt, T. P., & Loraas, T. M. (2021). A potential unintended consequence of "Big Data": Does information structure lead to suboptimal auditor judgment and decision-making? *Accounting Horizons*.

Hsieh, Y.-C., Tsai, W.-C., & Hsia, Y.-C. (2020). Technology anxiety across generations and gender. In Z. Gao et al (2021) (Ed.), *Human Aspects of IT for the Aged Population: Technology and Society* (pp. 241–254). Springer. https://doi.org/10.1007/978-3-030-50232-4_17

Kim, H.-N., Freddolino, P. P., & Greenhow, C. (2023). Older adults' technology anxiety as a barrier to digital inclusion: A scoping review. *Educational Gerontology, 49*(12), 1021–1038. https://doi.org/10.1080/03601277.2023.2202080

Kiswanto, K., & Maulana, P. A. (2019). Moderation of experience on the effect of fraud risk assessment, skepticism, and workload on fraud detection ability. J*urnal Ilmiah Akuntansi Dan Bisnis, 14*(2), 183–195. https://doi.org/10.24843/jiab.2019.v14.i02.p04

Lamboglia, R., Lavorato, D., Scornavacca, E., & Za, S. (2020). Exploring the relationship between auditing and technology: A bibliometric analysis. *Meditari Accountancy Research, 29*(5), 1233–1260. https://doi.org/10.1108/MEDAR-03-2020-0836

Leocádio, D., Malheiro, L., & Reis, J. C. G. (2024). *Auditors in the digital age: A systematic literature review*. Digital Transformation and Society.

Maier, C., Laumer, S., Weinert, C., & Weitzel, T. (2015). The effects of technostress and switching stress on discontinued use of social networking services: A study of

Facebook use. *Information Systems Journal, 25*(3), 275–308. https://doi.org/10.1111/isj.12068

Mat Ridzuan, N. I., Said, J., Razali, F. M., Abdul Manan, D. I., & Sulaiman, N. (2022). Examining the role of personality traits, digital technology skills and competency on the effectiveness of fraud risk assessment among external auditors. *Journal of Risk and Financial Management, 15*(11), 536. https://doi.org/10.3390/jrfm15110536

Moffitt, K. C., & Vasarhelyi, M. A. (2013). AIS in an age of big data. *Journal of Information Systems, 27*(2), 1–19. https://doi.org/10.2308/isys-50418

Mohd-Sanusi, Z., & Mohd-Iskandar, T. (2007). Audit judgment performance: Assessing the effect of performance incentives, effort and task complexity. *Managerial Auditing Journal, 22*(1), 34–52. https://doi.org/10.1108/02686900710715639

Mohd-Sanusi, Z., Mohd-Iskandar, T., Monroe, G. S., & Mohd Saleh, N. (2018). Effects of goal orientation, self-efficacy and task complexity on the audit judgement performance of Malaysian auditors. *Accounting, Auditing & Accountability Journal, 31*(1), 75–95. https://doi.org/10.1108/AAAJ-12-2015-2362

Nandemara, D., Haliaha, S., Syarifuddin, A., & Nirwana. (2024). Fraud risk judgments performance: The role of audit technology, task structure, and auditor competence. *Multidisciplinary Science Journal, 6*, e2024180. https://doi.org/10.31893/multiscience.2024180

Nerantzidis, M., Pazarskis, M., Drogalas, G., & Galanis, S. (2022). Internal auditing in the public sector: a systematic literature review and future research agenda. *Journal of Public Budgeting, Accounting & Financial Management, 34*(2), 189-209.

Ngo, H. T., Niem, L. D., Tran, P. C., Nguyen, T. T., Doan, D. T., & Ngo, H. T. (2023). Factors affecting academic staff development in the context of university autonomy through the lens of stakeholders: a case study from Tay Nguyen University, Vietnam. *Journal of Applied Research in Higher Education, 15*(2), 411-428.

Noor, N. F. (2022). *Analysis of competency and audit technology on audit job performance: Cross-examination of audit assessment and situational support* [Doctoral dissertation, Universiti Teknologi MARA]. https://doi.org/10.21203/rs.3.phd.1694591

Noor, N. F. M., Johari, R., & Sanusi, Z. M. (2024). The effects of audit competency and digital audit on audit performance: The mediating role of audit assessment. *Journal of Emerging Economies and Islamic*

Nugrahanti, T. P., & Jahja, A. S. (2018). Audit judgment performance: The effect of performance incentives, obedience pressures and ethical perceptions. *Journal of Environmental Accounting and Management, 6*(3), 225–234. https://doi.org/10.5890/JEAM.2018.09.004

Payne, E. A., & Ramsay, R. J. (2005). Fraud risk assessments and auditors' professional skepticism. *Managerial Auditing Journal, 20*(3), 321–330. https://doi.org/10.1108/02686900510585636

Popoola, O. M. J., Ahmad, A. C., & Samsudin, R. S. (2014). Forensic accounting knowledge and mindset on task performance fraud risk assessment. I*nternational Journal of Business and Management, 9*(9), 1–16. http://ssrn.com/abstract=2654800

Pramano, A. J., Razali, F. M., Said, J., Khalid, N., & Mohd Suffian, M. T. (2023). Digital technology skills and fraud risk judgement performance with auditors' competencies mediation. In *Building a Sustainable Future: Fostering Synergy in Social and Behavioural Sciences* (pp.627–640). European Proceedings.

Pratt, M. J., & Van Peursem, K. (1996). Auditing risk, materiality & judgement standards: An international comparison. *Managerial Finance, 22*(9), 86–101. https://doi.org/10.1108/eb018660

Rose, A. M., & Rose, J. M. (2003). The effects of fraud risk assessments and a risk analysis decision aid on auditors' evaluation of evidence and judgment. *Accounting Forum, 27*(3), 312–338.

Rosen, L. D., & Weil, M. M. (1995). Computer availability, computer experience and technophobia among public school teachers. *Computers in Human Behavior, 11*(1), 9–31. https://doi.org/10.1016/0747-5632(94)00018-D

Sanusi, Z. M., Shafie, N. A., Ghazali, A. W., Mat Isa, Y., Sanusi, S., Mat Jusoh, Y. H., & Mohd Nassir, M. D. (2023). *Integrating Trustworthy Framework in Digital Auditing: Readiness of Public Sector Accountants and Auditors*. Institut Perakaunan Negara, Jabatan Akauntan Negara Malaysia.

Saud, I. M., Sofyani, H., Utami, T. P., Haq, M. M., & Fathmaningrum, E. S. (2025). Big data analytics-based auditing adoption in public sector: Indonesian evidence. *Cogent Business & Management, 12*(1). https://doi.org/10.1080/23311975.2025.2454320

Sihombing, R. P., Narsa, I. M., & Harymawan, I. (2023). Big data analytics and auditor judgment: An experimental study. *Accounting Research Journal, 36*(2-3), 201-216. https://doi.org/10.1108/ARJ-08-2022-0187

Sofyani, H., Rohman, W. M., Oktavia, K. D., & Efsari, A. N. (2025). Big data analytics-based audit system quality and public sector audit performance: Audit judgment as mediator. *Jurnal Reviu Akuntansi dan Keuangan, 15*(1).

Solichin, M., Rahman, A. F., & Sukirman, S. (2022). Auditors' professional skepticism and fraud detection: The mediating role of competence and experience. *Accounting Analysis Journal, 11*(2), 155–167.

Solomon, I., & Trotman, K. T. (2003). Experimental judgment and decision-making research in auditing: The first 25 years of AOS. *Accounting, Organizations and Society, 28*(4), 395–412. https://doi.org/10.1016/S0361-3682(02)00056-4

Trotman, K. T., Tan, H.-T., & Ang, N. (2011). Fifty-year overview of judgment and decision-making research in accounting. *Accounting & Finance, 51*(1), 279–318. https://doi.org/10.1111/j.1467-629X.2010.00356.x

Trotman, K. T., & Wright, W. F. (2012). Triangulation of audit evidence in fraud risk assessments. *Accounting, Organizations and Society, 37*(1), 41–53. https://doi.org/10.1016/j.aos.2011.11.003

Volodina, T., Grossi, G., & Vakulenko, V. (2023). The changing roles of internal auditors in the Ukrainian central government. *Journal of Accounting & Organizational Change, 19*(6), 1–23. https://doi.org/10.1108/JAOC-04-2021-0057

Wilson, M. L., Huggins-Manley, A. C., Ritzhaupt, A. D., Ruggles, K., & Reeves, T. (2022). Development of the Abbreviated Technology Anxiety Scale (ATAS). *Behavior Research Methods, 55*, 185–199. https://doi.org/10.3758/s13428-022-01820-9

Wilks, T. J., & Zimbelman, M. F. (2004). Decomposition of fraud-risk assessments and auditors' sensitivity to fraud cues. *Contemporary Accounting Research, 21*(3), 719–745. https://doi.org/10.1506/HGXP-4DBH-59D1-3FHJ

Wolfe, D., & Hermanson, D. (2004). The fraud diamond: Considering the four elements of fraud. *CPA Journal, 74*(12), 38–42.