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Editorial Address:
Accounting Department, Faculty of Economics and Business, Universitas Ahmad Dahlan
Jl. Kapas No. 9, Semaki, Umbulharjo, Daerah Istimewa Yogyakarta 55166
E-mail : reksa@act.uad.ac.id

Leveraging Expertise for Digitalizing Indonesian Public Sector Performance Audits

Mohamad Mahsun[a,1,*], Oluwatoyin Muse Johnson Popoola[b,2]

[a]STIE Widya Wiwaha, Yogyakarta, Indonesia
[b]Universiti Utara Malaysia, Kedah Darul Aman, Malaysia
[1]mohmahsun@stieww.ac.id; [2]popoola@uum.edu.my
*Corresponding Author

Abstract

Global digital transformation is reshaping audit practices through technologies such as data analytics, artificial intelligence, and automation that enhance accuracy, efficiency, and scope. This study explores Indonesian auditors' perspectives and experiences regarding audit digitalization, particularly in the context of public sector performance audits. This qualitative research employs semi-structured interviews with 8 auditors from audit firms, analyzed using Braun and Clarke's thematic analysis approach. The study examines auditors' understanding of perceived benefits, encountered obstacles, required new skills, and necessary support for integrating digital technologies into audit activities. Findings reveal that audit digitalization offers significant benefits in efficiency, accuracy, and transparency, yet implementation faces challenges including limited human resources, poor data quality, and high costs. Auditors require both technical and non-technical skills, along with training and infrastructure support from audit firms. For the public sector, digitalization holds substantial potential for strengthening accountability and enabling data-driven policymaking. However, challenges such as bureaucratic barriers, inadequate data integration, and limited information systems infrastructure must be addressed. This study provides valuable insights and practical recommendations to support the digitalization of Indonesian public sector performance audits, ultimately enhancing the effectiveness and efficiency of public resource utilization.

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audit digitalization, performance audits, public sector, private sector expertise, Indonesia

Introduction

Accountability and efficiency are paramount for effective public sector governance, with performance audits playing a crucial role in ensuring their optimal implementation (Ismail et al., 2019; Purnamasari et al., 2024; Virnandes et al., 2024). These audits assess compliance with regulations and evaluate the effectiveness, efficiency, and economy of public resource utilization in achieving organizational objectives (Alqudah et al., 2019; Bini, 2019; Reichborn-Kjennerud et al., 2019). The global digital transformation is reshaping public sector performance audit practices (Bini, 2019; Leng & Zhang, 2024; Nguyen et al., 2020; Pizzi et al., 2021). The adoption of technologies such as big data analytics, artificial intelligence, and workflow automation is increasingly commonplace, enhancing audit accuracy, speed, and scope (Luan et al., 2024; Pizzi et al., 2021). In Indonesia, the drive to digitalize public sector audits is further propelled by the government's initiatives to achieve transparent and accountable governance, as well as the public's demand for quality and efficient public services (Purnamasari et al., 2024; Sabani et al., 2019; Widyaningsih et al., 2019). The use of technology in performance audits is expected to

strengthen oversight, minimize potential irregularities, and promote more effective and results-oriented use of state budgets for the optimal benefit of society.

The digitalization of public sector performance audits has become essential in the modern era, as it enables the utilization of big data for more comprehensive and precise analysis, enhances objectivity in evaluating performance, and increases efficiency throughout the audit process (Lu et al., 2024; Manita et al., 2019). Digital technologies empower auditors to rapidly access and analyze vast amounts of data, thereby identifying patterns and anomalies that may have remained obscured through traditional methods (Leng & Zhang, 2024; Liu et al., 2025; Pham & Vu, 2025; Vitali & Giuliani, 2024). However, the implementation of digitalized performance audits in developing nations often confronts significant obstacles, such as limited resources, inadequate information technology infrastructure, and a shortage of personnel skilled in technology and data analysis (Andrews et al., 2022; Reichborn-Kjennerud et al., 2019; Webb, 2019). Consequently, investing in digital infrastructure and developing human resource capacity represents a crucial step to support the digital transformation of performance audits in developing countries (Lois et al., 2020; Lu et al., 2024; Ruiz et al., 2024; Sabani et al., 2019).

Despite limited research on the digitalization of public sector audits in Indonesia (Marsely, 2020; Purnamasari et al., 2022; Sabani et al., 2019), this study aims to explore the existing knowledge gap in this area. While private sector entities, particularly Audit Firms, tend to be more advanced in adopting audit technologies (Al-Khasawneh, 2022; Ismail et al., 2019), their experiences can offer valuable insights and lessons that can be applied to the public sector. The rationale for using Private Sector Expertise as a sample in this study is based on the assumption that their mature and tested digitalization practices can provide a rich and relevant perspective for understanding the potential, challenges, and implementation strategies of technology in the context of public sector performance audits in Indonesia (Al-Khasawneh, 2022; Apandi et al., 2022; Volodina & Grossi, 2024). Thus, this study is expected to bridge the knowledge gap and provide practical contributions to the ongoing efforts to modernize public audits.

This study seeks to fill a crucial gap in the existing literature by exploring the perspectives and experiences of auditors in public practice regarding the digitalization of audit processes. Previous research has highlighted the broader challenges of digital transformation in the Indonesian public sector, such as low internet penetration, bureaucratic integration issues, and limited digital literacy among civil servants (Aminah & Saksono, 2021; Purnamasari & Hartanto, 2022; Putri & Retnosari, 2023; Saadah et al., 2023; Saifullah et al., 2019; Sudrajat, 2021). However, there is a dearth of in-depth understanding from the auditors' viewpoint on the key benefits, challenges, and skill requirements associated with the implementation of digital technologies in audit practices (Dempsey & Dyk, 2024; Kacanski, 2016; Lois et al., 2020; Nezhyva & Міняйло, 2020; Volodina & Grossi, 2024).

This study aims to address this research gap and provide actionable insights that can inform strategies and policies for enhancing the digitalization of performance audits in the Indonesian public sector. This study addresses this research gap by providing an in-depth understanding of the auditors' experiences, which can inform more targeted and effective policies and initiatives for the digitalization of public sector performance audits in Indonesia.While previous research has highlighted the broader challenges of digital transformation in the Indonesian public sector, such as low internet penetration, bureaucratic integration issues, and limited digital literacy among civil servants (Pratama et al., 2024), this study aims to provide actionable insights from the auditor's viewpoint. By understanding the key benefits, challenges, and skill requirements associated with the implementation of digital technologies in audit practices, this study offer valuable lessons for enhancing the digitalization of performance audits in the Indonesian public sector. The findings are expected to inform strategies and policies that can help bridge the gap between the aspirations of a digital economy and the practical realities faced by government agencies in optimizing their audit processes through technological advancements.

This study looks at how Indonesian auditors see and experience the digital transformation of audit practices. Based on the private sector's experiences, this study examines Auditor’s understanding of the

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benefits, challenges, new skills needed, and support required, to bring digital tech into audit practices. The big goal is to uncover insights and hurdles from Audit Firms' digitalization efforts.

This study explores crucial aspects of audit digitalization in Indonesia. First, this study aims to identify the key benefits and challenges perceived by auditors when implementing digital technologies, such as data analysis or CAATTs, during the audit process, based on their experiences. Secondly, this study seeks to understand the essential skills required for auditors' success in the digital era, and the support needed from companies and from professional organizations. Thirdly, this study aims to identify important lessons from the private sector's experience with audit digitalization, as well as unique challenges that the Indonesian public sector face in adopting similar technologies, to enhance their performance audits.

This study contributes the digitalization of public sector performance audits in Indonesia. Drawing from the perspectives and experiences of private sector auditors, this study offers valuable lessons for improving the effectiveness and efficiency of public sector audits. By examining the benefits, challenges, and essential skills linked to adopting digital technologies in audit practices, this study bridges a critical knowledge gap. The findings of this study also contribute to guide the modernization of public sector audits in developing countries such as Indonesia. Drawing on the mature and proven digitalization practices of private audit firms, this study provides practical recommendations to support ongoing efforts to digitalize public sector audits. These contributions ultimately bolster public sector accountability. Furthermore, this study contributes to public policy decision makers in developing policies regarding the digitalization of audits.

Literature Review

Public Sector Performance Audits

Public sector performance audits are a structured process undertaken to independently examine and assess the performance of government organizations, programs, or functions (Ismail et al., 2019; Mahsun et al., 2021; Sabani et al., 2019; Yasin et al., 2019). While these studies establish the fundamental role of performance audits, they often emphasize the compliance aspect. In contrast, other scholars argue that the primary aim of these audits should extend beyond mere compliance to provide an objective and reliable evaluation of whether public resources have been utilized in an economical, efficient, and effective manner to achieve predefined goals, thereby driving performance improvement (Caiden & Caiden, 1998; Cîmpan et al., 2023; Haliah et al., 2020; Harrell & Barbacci, 2018; Jackson, 1993; Kamara, 2023; Nirupa & Mark, 2012). These audits not only focus on compliance with regulations but also on identifying ways to optimize resource utilization, enhance desired outcomes, and recommend strategies for future performance improvement (Beckmerhagen et al., 2004; Brommelsiek & Tinsley, 1996; Chambers & Rand, 2012; Harrell & Barbacci, 2018; Lee & Novac, 2014; Lombardi et al., 2014; Mihiotis & Konidaris, 2006; Shaikh et al., 2018).

In the context of developing countries, public sector performance audits play a crucial role in fostering public accountability (Caiden & Caiden, 1998; Haliah et al., 2020; Kamara, 2023). Given the often limited resources available, it is essential to ensure that every unit of public funds is used responsibly and delivers maximum benefits to society (Caiden & Caiden, 1998; Igibayeva, 2020). These audits help identify inefficiencies, waste, and ineffective practices, thereby encouraging governments to be more transparent and accountable in managing state finances (Caiden & Caiden, 1998; Cunanan et al., 2022; Navarro et al., 2023). The findings and recommendations from performance audits can serve as a foundation for policy refinements, program enhancements, and ultimately, the improvement of public service quality and societal well-being (Baldwin, 2025; Halai et al., 2021; Haliah et al., 2020; Kwanbo, 2010; Rana et al., 2021).

Fintech and Audit Digitalization

Fintech encompasses a broad range of technological innovations applied to the financial sector, including mobile payment systems, online lending platforms, and advanced algorithms for risk assessment and fraud detection (Crouhy et al., 2021; Jagtiani & John, 2018). While audit digitalization focuses on the use of technology in the audit process, it is closely linked to the fintech revolution(Castri et al., 2018; Udeh et al., 2024). Technologies developed for the financial technology (fintech) industry often have functions that can be adapted for use in audits (Fedyk et al., 2022; Oladejo & Jack, 2020; Rodríguez-Quintero et al., 2021). For example, the advanced data analysis techniques that fintech companies use to analyze transaction patterns for credit assessment can also be valuable in audits to identify irregularities in financial statements.

The rise of financial technology has transformed various aspects of financial services and has the potential to impact audit practices. The use of technologies such as the Quick Response Code Indonesian Standard (QRIS) for non-cash transactions demonstrates how technology can enhance efficiency and user satisfaction, mediated by ease of use and the usage factor itself (Mirza et al., 2023; Tricahyono et al., 2024). In the context of audits, process digitalization is becoming increasingly important (Apandi et al., 2022; Tricahyono et al., 2024; Udeh et al., 2024). Understanding technology acceptance, as described in the Technology Acceptance Model, is relevant to understanding how auditors and audited entities adopt new digital tools (Prastyatini & Galaa, 2023). Audit digitalization can also help in detecting and preventing fraud, given the high incidence of fraud in various industry sectors (Qoshidah et al., 2025).

The rise of financial technology (fintech) has led to a surge in the volume and diversity of digital financial data (Leonov et al., 2020; Sun et al., 2024). Fintech platforms generate data on transactions, payments, investments, and customer behavior, which can provide auditors with a more comprehensive and detailed understanding of an organization's financial health (Ahmadi, 2024; Chu & Yong, 2021; Mhlanga, 2024). Even in cases where companies rely on traditional bank transfer methods, digital recordkeeping has led to increasingly digitalized audit trails (Apandi et al., 2022; Fedyk et al., 2022). The rapid advancements in financial technology have led to a significant growth in digital financial data, both in terms of volume and diversity (Zhong-qing et al., 2019). Fintech applications and platforms generate data on transactions, payments, investments, and customer behavior, which can provide auditors with a more comprehensive and detailed understanding of an organization's financial condition (Sun et al., 2020; Tekaya et al., 2020; Udeh et al., 2024). As a result, auditors must have the ability to access, analyze, and interpret this data, regardless of its source, highlighting the growing interconnection between financial technology and the digitalization of the audit process.

Fintech has also impacted how auditors assess risk (Sun & Qu, 2020; Wang, 2023). Fintech companies utilize advanced algorithms to identify and manage financial risks, such as credit risk and fraud risk. These techniques can inform and enhance audit risk assessment methodologies (Bazarbash, 2019; Roszkowska, 2020). For instance, machine learning algorithms can be employed to analyze large datasets and identify patterns that may indicate potential fraud (Elsayed, 2017; Ikudabo & Kumar, 2024; Xu et al., 2024). These capabilities are highly relevant for auditors seeking to improve the accuracy and efficiency of their risk assessment procedures.

The rapid advancements in financial technology necessitate a dynamic and adaptable regulatory environment. Regulators grapple with issues such as data security and privacy, which have direct implications for the digitalization of the audit process (Batista & Ringe, 2020; Castri et al., 2018). Auditors must be cognizant that the evolving fintech regulatory landscape may shape new standards and procedures they must adhere to when auditing companies utilizing fintech solutions. Auditors need to understand and comply with regulations related to data privacy, information security, and other requirements applicable to the fintech industry (Alam et al., 2019; Vijayagopal et al., 2024). Auditors' knowledge of these regulations will assist them in effectively and compliantly executing their duties.

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The blurring of boundaries between fintech and audit digitalization is a likely future trend. Advancements in fintech will create new opportunities and challenges for auditors. Even organizations currently relying on traditional methods may be influenced by fintech innovations, whether through competitive pressures, changes in customer behavior, or the adoption of new technologies to enhance their own efficiency (Ali et al., 2018; Arner et al., 2017; Kou & Lu, 2025). Consequently, auditors must proactively engage with fintech developments, acquire the necessary skills to audit fintech-driven data and systems, and contribute to the ongoing dialogue about the future of auditing in a fintech-influenced environment.

Concepts of Performance Audit and Audit Digitalization

Performance audits in the public sector are a structured process to independently examine and assess the performance of government organizations, programs, or functions (Bini, 2019; Liu et al., 2025). The main purpose of Performance Audits is to provide an objective and reliable evaluation of how economically, efficiently, and effectively public resources are used to achieve stated goals (Caiden & Caiden, 1998; Harrell & Barbacci, 2018; Ismail et al., 2019). These audits focus not just on compliance with regulations, but also on finding ways to optimize resource use, improve desired outcomes, and recommend strategies for future performance enhancement (Eze & Ibrahim, 2015; Gingerich, 2002). In developing countries, performance audits play a crucial role in promoting public accountability, ensuring responsible use of public funds, and encouraging transparency in public financial management (Caiden & Caiden, 1998; Heinrich, 2008).

Audit digitalization involves incorporating digital technologies into traditional audit practices. This includes using tools like data analytics, artificial intelligence, and automated workflows (Ellul & Buttigieg, 2021; Fedyk et al., 2022). This shift has significantly changed the entire audit process, from planning to reporting. Research shows that this digital transformation offers benefits such as improved efficiency, the ability to analyze large datasets, better risk identification, and deeper insights for decision-making (Al-Khasawneh, 2022; Fedyk et al., 2022; Fotoh & Lorentzon, 2022; Leocádio et al., 2024; Lois et al., 2020). Audit digitalization expands this concept by leveraging technology for more in-depth and efficient data collection, analysis, and reporting. For example, audit delay can be influenced by various internal company factors, including operational complexity, which can be facilitated by digital tools (Al-Faruqi, 2020). In the context of SMEs, the implementation of simple, even manual, accounting practices is a first step towards better accountability, which can then be enhanced through the adoption of accounting technology for business sustainability (Cordery et al., 2023; Gao, 2024). Digitalization also enables more comprehensive and transparent disclosure, such as the disclosure of Environmental, Social, and Governance aspects, whose role is moderated by institutional ownership on firm value (Fauziah et al., 2024; Hu & Yang, 2024). Similarly, charitable non-profit organizations use web platforms for accountability, although there is often a practice of selective disclosure, particularly related to financial data (Cordery et al., 2023; Fauziah et al., 2024; Qoshidah et al., 2025; Mirza et al., 2023; Suandi & Asrimiyanti, 2025).

While the adoption of audit digitalization offers numerous benefits, it also presents a complex array of challenges for auditors. One of the primary obstacles is the limited human resources, as many auditors lack the in-depth understanding or adequate skills required to effectively utilize digital technologies (Fotoh & Lorentzon, 2022; Kokina et al., 2025; Lois et al., 2020). Furthermore, the lack of appropriate training and access to the necessary resources to build digital capacity are significant constraints(Berghout et al., 2022; Leng & Zhang, 2024; Lois et al., 2020). Additionally, data quality and availability pose major challenges, as many financial information systems, particularly in the public sector, are not yet integrated or still rely on manual methods, resulting in data that is often non-standardized, fragmented, and difficult to analyze digitally (Ding et al., 2017; Seyam et al., 2016). Other impediments include limited infrastructure and high costs associated with investments in hardware, software, and the necessary training required for auditors (Lois et al., 2020; Okab, 2013).

The interplay between performance audits and audit digitalization is pivotal in the contemporary landscape. Digitalization empowers auditors to rapidly access and analyze extensive datasets, enabling the identification of patterns and anomalies that may go unnoticed through conventional methods (Fedyk et al., 2022; Fotoh & Lorentzon, 2022; Lois et al., 2020). This directly aligns with the purpose of performance audits, which is to evaluate efficiency and effectiveness. By harnessing digital technology, performance audits can be more comprehensive, precise, objective, and efficient, ultimately enhancing accountability and supporting data-driven policymaking in the public sector (Ellul & Buttigieg, 2021; Loke et al., 2016; Masood & Lodhi, 2015). To overcome these challenges, auditors necessitate a combination of technical and non-technical competencies, as well as ongoing organizational support in the form of adequate training and infrastructure (Apandi et al., 2022; Oladejo & Jack, 2020; Vitali & Giuliani, 2024).

Skills and Support for Audit Digitalization

The adoption of key technologies, such as Computer-Assisted Audit Techniques and Data Analytics, has driven significant changes to traditional auditing practices, transforming the process from planning to reporting (Serpeninova et al., 2019; M. Sun & Qu, 2020; Y. Sun et al., 2024; Teeter et al., 2010). While the literature extensively documents the advantages of this digital transformation, such as enhanced efficiency, the capacity to analyze extensive datasets, more accurate risk identification, and deeper insights to inform decision-making (Fotoh & Lorentzon, 2022; Leocádio et al., 2024; Nwankpa, 2014; The Role of Technology in Auditing, 2024), there is less emphasis on the potential drawbacks and challenges of relying heavily on technology in auditing. This paper will explore both the benefits and challenges.

Nevertheless, this transition also presents a range of challenges, necessitating auditors to acquire new skillsets, initial investments in technological infrastructure, concerns regarding data security, and the need to seamlessly integrate novel digital tools and techniques into existing audit workflows (Friedlich, 2024; Lois et al., 2020; Nwankpa, 2014; Thompson, 2018; Wang, 2023). Audit digitalization requires both auditors and audited entities to possess adequate expertise and receive sufficient support. A strong understanding of finance and technology is crucial for all involved to ensure successful implementation(Apandi et al., 2022; Manita et al., 2019). For instance, research shows that audit quality, often associated with reputable audit firms, positively impacts the extent to which companies disclose their ethical values (Knechel, 2016; Qoshidah et al., 2025; Rakhman & Wijayana, 2024). Furthermore, regulatory support in the form of a clear legal framework, as well as efforts to enhance the capabilities of human resources in the field of sustainable finance, also play a key role in promoting the adoption of digital and sustainable practices across various sectors (Castri et al., 2018; Mirza et al., 2023; Rosalika et al., 2024; Septiana et al., 2024).

The context of audit digitalization in Indonesia reflects an intriguing trend across both the public and private sectors (Harsanto et al., 2022; Meiryani et al., 2021; Purnamasari et al., 2022; Purnamasari & Hartanto, 2022; Yasin et al., 2019). Comprehensive data regarding the extent of technological adoption across all audit firms may not be readily available; however, observations and discourse within the profession indicate a burgeoning awareness and implementation of audit-related technologies (Lamboglia et al., 2020; Lestari et al., 2020; Tysiac, 2022). Large audit firms with multinational clients tend to be at the forefront of adopting technology-based audit tools, such as data analytics and automation (Oldhouser, 2016; Teeter et al., 2010; Tysiac, 2022; Vasarhelyi & Romero, 2014). Similarly, in the public sector, the Supreme Audit Institution of Indonesia, as the country's highest audit body, demonstrates a strong commitment to digitalization (Agustina & Indrayani, 2020; Pratama et al., 2024; Purnamasari & Hartanto, 2022; Sudrajat, 2021; Yasin et al., 2019). SAI Indonesia has initiated various programs and technology-based information systems to enhance the efficiency and effectiveness of audits, including the utilization of big data and other analytical tools in state financial examinations (Giovani et al., 2023; Purnamasari & Hartanto, 2022; Sudrajat, 2021; Yasin et al., 2019). These initiatives indicate a significant drive towards digital transformation in audit practices within Indonesia.

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Research Method

This study employed a qualitative research methodology with an exploratory design. The rationale for the use of a qualitative methodology with an exploratory design is that it enables a deep and comprehensive understanding of the individual perspectives and experiences pertaining to the phenomenon under investigation (Flick, 1998; Merriam, 2009; Najam & Ghazal, 2022; Perri & Bellamy, 2012). This qualitative methodology enables researchers to gather in-depth and comprehensive insights from participants, thereby providing a profound understanding of the issue of audit digitalization from the practitioners' point of view.

The participants in this study consists of auditors working in Audit Firms located in major cities in Indonesia. The sample size is between 8 auditors, with a minimum criterion of being a Senior Auditor to ensure relevant experience, as presented in Table 1. The eight (8) informants were selected based on their knowledge and experience related to the research topic. The selection began with one key informant and continued on the basis of referral from the initial participant until reaching eight (8) informants in total as the reaching saturation point (Goodman, 1961; Luborsky & Rubinstein, 1995; Robinson, 2014; Shorten & Moorley, 2014). Efforts will be made to involve auditors from various sizes of Audit Firms to obtain diverse perspectives.

Primary data were collected from the informants through online and offline semi-structured interview. Semi-structured interviews were selected as the main data collection method to allow an in-depth exploration of the participants' perspectives while maintaining a degree of structure in the interview process. The interviews will be conducted either face-to-face or virtually via video conferencing.

The research will employ thematic analysis, following the framework developed by Braun & Clarke, (2006). First, the interview transcripts were carefully reviewed multiple times to familiarize the researchers with the data and gain a deep understanding of the participants' perspectives. Next, the data was systematically coded, with relevant text segments identified and labeled. Similar codes were then grouped together to search for broader themes emerging from the data.

To ensure the validity and coherence of the themes, an iterative process of reviewing and refining was undertaken. Finally, the research team clearly defined and named each theme to capture its essence concisely.

Table 1. Summary of Participant Demographics

Participant	Job Level/ Position	Work Experience	Firm Category	Main Digital Audit Technology/Tools Used
P1	Senior Auditor	3 - 5 years	Non-Big Four	Caseware
P2	Junior Auditor	< 3 years	Non-Big Four	Excel
P3	Partner	> 10 years	Non-Big Four	Atlas
P4	Partner	> 10 years	Non-Big Four	ATLAS
P5	Junior Auditor	3 - 5 years	Prefer Not to Disclose	Excel
P6	Partner	6 - 10 years	Non-Big Four	Atlas
P7	Manager	> 10 years	Non-Big Four	Excel
P8	Junior Auditor	3 - 5 years	Non-Big Four	ATLAS

The findings from this rigorous thematic analysis are presented in the report, and any secondary data collected has been integrated into the analysis to provide a richer and more in-depth context to the research findings. This multi-step approach, combined with the consideration of trustworthiness factors such as credibility, transferability, dependability, and confirmability, ensures the reliability and validity of the study's results.

Results and Discussion

Result

The Real Benefits of Audit Digitalization in Audit Firms

Table 2 presents the main themes and benefits of audit digitalization, as identified by participants in this study. The themes are categorized based on the advantages of digitalization in the audit process, including time efficiency, accuracy, data analysis, visualization, documentation, control, transparency, and issue identification. Quotes from participants are included to illustrate each theme and provide insight into their experiences with audit digitalization.

Table 2. Auditor Perspectives on Digitalization in Audit

Main Theme	Brief Theme Description	Quote from Participant (Anonymous)
1. Time Efficiency and Speed.	Audit digitalization significantly speeds up the audit process. This includes accelerating financial statement analysis, determining account materiality, and processing data.	*"Can monitor audit programs and help identify audit risks within one audit cycle*" (P1, Senior Auditor, 3-5 Years)*"Time efficiency, deeper data analysis capabilities, clear data visualization,* (P2, Junior Auditor, < 3 years)
2. Increased Accuracy and Detail	The use of digital audit technology improves data accuracy and enables more detailed analysis.	*"The use of digital audit technology speeds up the audit process, improves data accuracy, and facilitates analysis and team collaboration. Additionally, documentation is neater and audit transparency is increased."* (P8, Junior Auditor, 3-5 years)
3. Deeper Data Analysis Capabilities	Digital technology enables auditors to conduct more in-depth data analysis, including big data analysis.	*"Improving performance, addressing HR and training limitations, utilizing big data analysis, being responsive, and emphasizing the importance of big data access."* (P7, Manager, 7-10 years)
4. Effective Data Visualization	Audit digitalization enhances data visualization clarity, facilitating more accurate understanding and interpretation of audit findings.	"*clear data visualization*" (P2, Junior Auditor, < 3 years)
5. Neat and Reproducible Documentation	Digital technology enables audit documentation to be more systematic, organized, and easily reproducible.r.	*"neat and reproducible documentation, no need for additional software."* (P2, Junior Auditor, < 3 years)
6. Enhanced Control and Compliance Capabilities	Digitalization of audit enhances control and compliance with relevant regulations and audit standards.	"Enables faster workflow and enhances control and compliance mechanisms." (P6, Partner, 6-10 years)
7. Enhanced Transparency and Accountability	Enhance transparency and accountability, particularly in public sector auditing.	*"Yes, there is a specific benefit in terms of increasing transparency and public accountability in real-time."* (P8, Junior Auditor, 3-5 years)
8. Faster Issue Identification	Audit digitalization enables faster identification of issues, particularly in public services. This allows the government to formulate more targeted data-driven policies.	*"Indeed, I firmly believe that leveraging digital technology in government performance audits can yield substantial benefits, including improved budget transparency, expedited issue identification in public services, and more informed, data-driven policy formulation."* (P1, Senior Auditor, 3-5 years)
9. Rapid Inspection Access	Digitalization enables quicker access to audit data and information, removing the wait for physical documents	*"Indeed, The use of a system enhances objectivity, Examination access is expedited, eliminating the need to wait for physical copies."* (P3, Partner, > 10 years)

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Audit digitalization brings tangible benefits in terms of efficiency and speed of the audit process. Participants in various positions, from junior auditors to partners, acknowledge that the use of digital technology such as data analysis software (e.g., ATLAS and Excel) accelerates financial report analysis, materiality determination, and data processing. Senior auditors even mention that digitalization enables audit program monitoring and risk identification within a single audit cycle. This shows that digital technology helps auditors complete their work faster and more efficiently, without waiting for hard copies or performing time-consuming manual processes.

In addition to efficiency, audit digitalization also enhances data analysis accuracy and depth. Participants, particularly junior auditors, note that digital technology enables more in-depth data analysis, clear data visualization, and well-organized documentation that is reproducible. This deeper analysis capability helps auditors identify patterns and anomalies that might be missed in traditional audit methods. Furthermore, managers with over 10 years of experience mention big data analysis, which enables the government to make more targeted policies based on more comprehensive data. This demonstrates that digitalization not only accelerates the audit process but also improves the quality and thoroughness of audit results.

Transparency and accountability are also significant benefits of audit digitalization. Junior and senior auditors emphasize that digitalization produces a strong and objective audit trail, making audit results more accountable to the public. This enhances accountability and transparency, particularly in public sector audits. Participants also mention that digitalization enables faster identification of issues in public services, allowing the government to formulate more targeted data-driven policies. Thus, audit digitalization not only benefits auditors in performing their duties but also has a broader positive impact on society through increased transparency and accountability in the public sector.

Table 2 highlights the various benefits of audit digitalization, from increased efficiency and accuracy to enhanced transparency and accountability. The quotes from participants provide valuable insights into their experiences and perceptions of digitalization in the audit process.The participants' responses indicate that audit digitalization yields substantial benefits, including enhanced efficiency and speed in audit processes, improved data analysis accuracy and depth, and increased transparency and accountability. By leveraging digital tools, auditors can analyze financial reports and process data more quickly, identify patterns and anomalies more effectively, and produce a robust audit trail. This, in turn, enables the government to develop more informed policies and improves accountability in the public sector, ultimately benefiting society as a whole.

Major Barriers to Digitalization Implementation in Firm Audit

Although audit digitalization offers various benefits, such as increased efficiency and accuracy, there are several barriers that need to be overcome for its successful implementation. These barriers include limitations in human resources, issues with data quality, cost constraints, and specific challenges that may be faced in the public sector. To better understand these barriers, Table 3 provides a detailed examination of the key challenges to audit digitalization implementation.

Table 3 outlines the key barriers to implementing audit digitalization, as described by the participants. These include: Limited auditor capabilities and understanding of digital technologies, Issues with data quality and availability, such as non-integrated and non-standardized systems, Infrastructure and cost limitations that hinder the necessary investments, Specific challenges in the public sector, like bureaucratic complexity and budget constraints.

One of the main obstacles in implementing audit digitalization is the limitation of human resources. Many auditors lack a deep understanding or adequate skills in using digital technology. The lack of proper training and access to necessary resources to enhance digital capabilities is also a constraint. This leads to difficulties in adopting and utilizing digital audit tools effectively. Auditors may feel uncomfortable or lack confidence in using new technology, which can hinder the transition process to digitalization.

Table 3. Challenges to Audit Digitalization Implementation

Main Barriers to Audit Digitalization Implementation	Brief Theme Description	Quote from Participant
Limited Auditor Capability and Understanding	Limited auditor capability and understanding of digital technology can hinder the implementation of audit digitalization.	*"Many are not yet familiar with using systems properly and correctly."* - Partner (6-10 years of experience)
Data Quality and Availability	Poor data quality and availability can affect the effectiveness of audit digitalization.	*"Many financial information systems in the regions are still manual, fragmented, and non-standardized. Data formats between agencies differ, making it difficult to analyze digitally."* - Junior Auditor (3-5 years of experience)
Infrastructure and Cost Limitations	Limited infrastructure and cost can be a barrier to implementing audit digitalization.	*"Audit digitalization will face many obstacles, especially in terms of costs and HR that meet the requirements to implement the results of digitalization."* - Junior Auditor (3-5 years of experience)
Specific Challenges in the Public Sector	The public sector has specific challenges that need to be addressed in implementing audit digitalization, such as rigid bureaucracy and digital competency gaps.	*"Additional specific challenges could include rigid bureaucracy, limited technology budgets, and digital competency gaps among auditors in different regions. Furthermore, unintegrated data access between government agencies could also hinder the effectiveness of digital audits."* - Junior Auditor (3-5 years of experience)

Additionally, data quality and availability are also significant issues. Many financial information systems, especially in the public sector, are not yet integrated or still use manual methods. This results in non-standardized, fragmented, and difficult-to-analyze data digitally. Unclean and incomplete data requires a lot of time to process and consolidate before it can be used for audit purposes. As a result, the expected efficiency of audit digitalization is hindered. Limited access to relevant data is also a constraint, especially if the data is scattered across different agencies or systems.

Another significant obstacle is the limitation of infrastructure and costs. Implementing audit digitalization requires significant investment in hardware, software, and training. Many organizations, especially in the public sector with limited budgets, may struggle to meet these needs. Additionally, the availability of adequate IT infrastructure, such as stable internet networks and strong servers, is also a crucial factor. Without adequate infrastructure, the use of digital technology in audit becomes difficult and inefficient. The transition from conventional to digital audit processes also requires adjustments and adaptations that may require additional time and resources. Moreover, there is concern about data security and privacy.

According to the participants, addressing these multifaceted barriers is essential to ensure effective and successful audit digitalization. Overcoming limitations in human resources, data, and infrastructure, as well as navigating public sector-specific hurdles, is crucial to maximize the benefits of this digital transformation.

Key Skills and Essential Support

Audit digitalization requires adequate skills and support to be effectively implemented. Table 4 presents the skills and support needed for audit digitalization, including technical and non-technical skills,

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training support, and internal policies that support it. Participant quotes provide insights into their experiences and perceptions of the required skills and support.

Table 4. Required Skills and Support

Category	Sub-Category	Skills/Support	Participant Quote
Key Skills	Technical Skills	Data analysis capability, CAATS tools mastery, SQL basics, accounting information systems knowledge	*"Data analysis capability, CAATS tools mastery, SQL basics, accounting information systems knowledge."* - Junior Auditor (< 3 years of experience)
		Ability to penetrate accounting systems and assess system controls	*"Ability to penetrate accounting systems and perform system control assessments."* - Partner (> 10 years of experience)
		Data Analysis	*"Data Analysis"* - Junior Auditor (3-5 years of experience)
	Non-Technical Skills	Problem-solving and critical thinking	*"Problem-solving and critical thinking because auditors often face complex data or new systems. Critical thinking helps determine appropriate testing, analyze results, and identify hidden risks."* - Junior Auditor (< 3 years of experience)
		Communication, verbal knowledge of technological developments	*"Communication, verbal knowledge of technological developments"* - Partner (> 10 years of experience)
		Communication, adaptation, initiative	*"Communication, adaptation, initiative"* - Partner (6-10 years of experience)
Essential Support	Training & Development	Training on risks of using accounting tools	*"Training on risks of using accounting tools to minimize audit risks and adjust audit procedures."* - Senior Auditor (3-5 years of experience)
		Workshop training on program and technology usage	*"Workshop training on program and technology usage that facilitates both parties."* - Junior Auditor (3-5 years of experience)
		Audit software training (e.g., ATLAS)	*"Audit software training, such as ATLAS"* - Partner (> 10 years of experience)
		Regular technical training	*"Regular technical training, with practical training on audit software, data analytics, and IT systems, makes auditors more technically prepared."* - Junior Auditor (3-5 years of experience)
	Policies & Infrastructure	Internal policies supporting audit digitalization	*"Internal policies supporting audit digitalization, such as allocating time for digital tool exploration and incentives for teams initiating technology-based approaches."* - Junior Auditor (< 3 years of experience)
		IT knowledge for digital data examination	*"IT knowledge to support digital data examination"* - Partner (> 10 years of experience)

Auditors in the digital era require a multifaceted skillset that combines technical and non-technical proficiencies. According to the survey participants, key technical skills encompass data analysis capabilities, mastery of CAATS tools, basic SQL knowledge, and understanding of accounting information systems. Additionally, the ability to navigate and assess the controls within accounting systems is emphasized. Proficiency in utilizing specific audit software, such as data analysis tools (e.g., ACL/IDEA), custom CAATTs, cloud-based audit platforms, and audit process automation software, is also considered crucial.

These findings suggest that auditors must possess a robust understanding of the technology and tools employed in the digital audit process.

In addition to technical proficiencies, non-technical skills are equally crucial for effective audit digitalization. Auditors require problem-solving and critical thinking abilities to navigate complex data and new systems, determine appropriate testing methods, analyze results, and identify hidden risks. Furthermore, communication skills, such as verbal knowledge of technological advancements and the capacity to adapt and demonstrate initiative, are also emphasized as essential for auditors in this digital era. These non-technical competencies, combined with technical skills, form a well-rounded skillset necessary for successful implementation of audit digitalization.

To support the development of these skills, essential support from Audit Firm is needed. This support includes "training on the risks of using accounting tools," "workshop training on program and technology usage," "audit software training such as ATLAS," and "regular technical training." Furthermore, "internal policies supporting audit digitalization," such as allocating time for digital tool exploration and incentives for teams that take initiative, as well as "IT knowledge to support digital data examination" are also crucial.

The participants' responses suggest that successful audit digitalization implementation depends on auditors having a blend of technical and non-technical skills, backed by organizational support. Technical skills like audit software proficiency and data analysis are essential, but auditors also need non-technical skills like critical thinking, problem-solving, and effective communication. To develop these skills, auditors require comprehensive support, including training, infrastructure, and policies that foster digitalization. With the right combination of skills and support, auditors can effectively leverage digital technology and navigate the challenges of audit digitalization.

Learning and Anticipating Challenges for the Public Sector

This section examines key lessons that public sector audit institutions in Indonesia can learn from the digitalization experiences of Audit Firm. It also anticipates specific challenges the public sector may face in implementing digital technology. Table 5 presents the lesson from the private sector.

Table 5. Lesson from Private Sector

Theme	Theme Description	Participant Quote
Important Lessons from Audit Digitalization	The public sector in Indonesia can learn from the private sector's experience by recognizing the need for reliable data infrastructure readiness, auditor capacity building, and adoption of risk-based audit approaches to maximize the benefits of audit digitalization.	*"Public sector audit institutions in Indonesia need to ensure reliable data infrastructure readiness, digital capacity building for auditors, and adoption of risk-based audit approaches to maximize the benefits of audit digitalization. The use of technologies such as data analytics and AI must be accompanied by good data governance, information security policies, and organizational culture change support for effective and sustainable digital transformation."* - Senior Auditor (3-5 years of experience)
Specific Challenges for the Public Sector	In addition to common challenges faced by KAP, specific challenges that may be faced by public sector auditors in Indonesia include limitations of information systems in audited entities.	*"In addition to common challenges such as HR readiness and data infrastructure, public sector auditors in Indonesia are likely to face additional challenges in the form of limitations of information systems in audited entities, which are often not fully digitalized or not standardized."* - Senior Auditor (3-5 years of experience)
Special Benefits for the Public Sector	Audit digitalization provides special benefits to the public sector, such as increased transparency and real-time public accountability.	*"Yes, there are special benefits in the form of increased transparency and real-time public accountability."* - Junior Auditor (3-5 years of experience)

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Audit digitalization provides significant benefits in improving the efficiency, accuracy, and transparency of the audit process. However, its implementation faces challenges such as HR limitations, poor data quality, and cost constraints. Auditors need technical and non-technical skills and support from KAP in the form of training and infrastructure. For the public sector, digitalization has the potential to improve accountability and data-driven policies, but challenges such as bureaucracy, lack of data integration, and limitations of information systems must be addressed.

As Table 5 shows, public sector audit institutions in Indonesia can draw several key lessons from the participants' responses. To successfully implement audit digitalization, they need to prioritize data infrastructure readiness, build auditors' digital capacity, and adopt risk-based audit approaches. They must also address specific challenges, including limited digitalization and standardization of information systems, bureaucratic rigidity, budget constraints, and regional digital competency gaps. By overcoming these challenges, audit digitalization can enhance transparency, accountability, and data-driven policymaking in the public sector.

Discussion

Audit digitalization offers various significant benefits, including increased efficiency and speed of the audit process, which accelerates financial report analysis, materiality determination, and data processing. Digital technology also enhances the accuracy and depth of data analysis, enables clearer visualization, and produces a strong and objective audit trail, thereby increasing transparency and accountability. Additionally, digitalization enables faster identification of problems in public services and helps the government formulate data-driven policies. However, implementing audit digitalization faces various challenges, such as limited human resources in terms of understanding and technical skills, poor data quality and availability, cost constraints for IT infrastructure and training, and specific challenges in the public sector such as bureaucracy and data integration.

Overcoming these challenges necessitates a combination of technical and non-technical skills, along with organizational support. Auditors need technical skills, such as proficiency in audit software and data analysis, as well as non-technical skills, such as critical thinking, problem-solving, and effective communication (Volodina & Grossi, 2024). In addition, organizational support, including providing adequate training, infrastructure, and policies that promote digitalization, is essential to develop these skills. By addressing these challenges and providing the necessary skills and support, auditors can leverage digital technology to improve the quality and effectiveness of public sector audits.

To successfully implement audit digitalization, auditors need a combination of technical skills, such as mastery of audit software and data analysis, and non-technical skills, such as problem-solving and communication. Support from Audit Firm is crucial, including ongoing training, supportive internal policies, adequate IT infrastructure, and support from professional organizations such as IAPI. For the public sector, audit digitalization is highly relevant because it has the potential to increase transparency and public accountability in real-time and help the government make more targeted policies. However, the public sector needs to overcome specific challenges such as bureaucracy and data integration to ensure the successful implementation of audit digitalization.

Skills and Support Implications

The findings from the Indonesian audit firms align with the broader global and regional trends in audit digitalization. Studies have consistently emphasized the importance of data governance (Janvrin & Mascha, 2014; Vasarhelyi et al., 2012), change management (Appelbaum et al., 2017), and human capital development (Alles, 2015; Omoteso, 2016) as critical success factors for the effective adoption of digital audit techniques. The challenges observed in the Indonesian context, such as data fragmentation and bureaucratic obstacles, are also consistent with the barriers faced by public sector organizations in other developing economies (Heeks, 2002; Soh & Sia, 2004). However, the Indonesian experience provides

valuable context-specific insights that can inform strategies for successful digital transformation in the public sector, complementing the broader audit digitalization literature (Alles & Gray, 2019; Janvrin & Mascha, 2014). Moreover, Indonesian civil servants still need digital literacy, highlighting the need for urgent skill development (Pratama et al., 2024).

Indonesian audit firms' experiences in digitalizing audit offer valuable insights for the public sector. Firms highlight the importance of strategic planning, investing in auditor skills, and prioritizing data security and privacy. Lessons from the private sector emphasize collaboration and effective change management to facilitate adopting new technologies.

Based on this analysis, recommendations for Indonesian public accounting firms include: Continuing to invest in upgrading auditors' data analytics and related technology skills, Strengthening collaborative efforts to share knowledge and best practices, Advocating for a regulatory framework supporting innovation in digital auditing

Key findings from audit firms' experiences adopting digital tools and techniques for performance audits include the importance of robust data governance, effective change management, and strategic investment in human resource development. Firms have seen benefits like enhanced data analysis, but also challenges like bureaucracy, data fragmentation, and the need for specialized skills. Addressing these requires a phased approach, inter-agency cooperation, and a focus on upskilling auditors through training.

The Indonesian experience aligns with broader global and regional trends in audit digitalization, emphasizing data governance, change management, and human capital development as critical success factors(Aswar et al., 2021; Kurniawan & Arti, 2020; Meiryani et al., 2021; Purnamasari & Hartanto, 2022; Yasin et al., 2019). Indonesian context-specific insights can inform strategies for successful digital transformation in the public sector. Innovation will also be a central element in evaluating audit and career progression of collaborators (Manita et al., 2019).

To leverage the expertise of private sector auditors in enhancing Indonesian public sector performance audits through digitalization, several strategies can be employed:

Knowledge Transfer Programs: Develop programs to transfer knowledge and skills from experienced private sector auditors to their public sector counterparts, especially in data analytics, IT governance, and emerging technologies (Manita et al., 2019).

Joint Training Initiatives: Conduct joint training initiatives to enhance auditors' IT skills (Manita et al., 2019; Nguyen et al., 2020; Omoteso, 2016; Popoola et al., 2015).

Collaboration Platforms: Establish platforms for ongoing collaboration between private and public sector auditors to share insights and best practices in audit digitalization (Alles & Gray, 2019; Manita et al., 2019; Omoteso, 2016; Vitali & Giuliani, 2024).

Policy Recommendations: Develop policy recommendations based on the experiences of private sector auditors to support the adoption of digital technologies in the public sector audit process (Al-Khasawneh, 2022; Nezhyva & Міняйло, 2020; Volodina & Grossi, 2024) .

Bridging the Private and Public Sectors

For the Indonesian public sector, the development of a clear and well-funded national strategy to digitize public sector performance audits is critical. Priority should be given to comprehensive training programs to build digital competency among public sector auditors. Challenges related to data quality and interoperability across government systems need to be addressed. A robust data security and privacy framework tailored to the public sector context should be established (Kreuter et al., 2019; Lois et al., 2020; Syahidin, 2021; UNDP Digital Leadership Learning Modules, 2024). Engagement with relevant stakeholders to review and update the regulatory framework to support digital audits is also needed (Bouke et al., 2023; "Digital Public Infrastructure for Digital Governments," 2024; Lois et al., 2020; Wylde et al., 2022). Investment in the necessary IT infrastructure and provision of ongoing technical support to audit

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bodies across the country is essential. Finally, a culture of innovation and continuous improvement in public sector auditing through the strategic adoption of digital technologies should be fostered.

Conclusion

Audit digitalization provides significant benefits in improving the efficiency, accuracy, and transparency of the audit process. Auditors from various levels of position and experience report that the use of digital technology such as data analysis software (ATLAS, Excel, etc.) accelerates financial report analysis, materiality determination, and data processing. Additionally, digitalization enables more in-depth data analysis and clear data visualization, making it easier to identify patterns and anomalies. Transparency and accountability also increase because digitalization produces a strong and objective audit trail, and enables faster detection of problems, especially in public services. These benefits ultimately support the government in formulating more targeted data-driven policies.

However, implementing audit digitalization also faces various challenges. Limited human resources (HR) in terms of understanding and technical skills, poor data quality and availability, and cost constraints for IT infrastructure investment and training are major obstacles. Additionally, specific challenges in the public sector such as complex bureaucracy, limited information systems that are not yet digitalized, and digital competency gaps among auditors in different regions add layers of difficulty. To overcome these challenges, support from Audit Firms in the form of ongoing training, supportive internal policies, and adequate IT infrastructure is needed.

The development of both technical and non-technical competencies among auditors is equally vital, alongside the need for collaboration and synergy across technology, training, and consistent policy support. The analysis of audit firms' experiences and their implications for the Indonesian public sector suggests several key takeaways. First, while there are significant potential benefits to digitalizing audit, there are also numerous challenges that must be addressed, including the need for strategic planning, investment in skills development, and careful attention to data security and privacy. Second, lessons from the private sector emphasize the value of collaboration and effective change management in facilitating the adoption of new technologies. Finally, for the Indonesian public sector, the development of a clear and well-funded national strategy to digitize public sector performance audits is critical, with priorities including comprehensive training programs, addressing data quality and interoperability issues, establishing a robust data security framework, and fostering a culture of innovation and continuous improvement through the strategic adoption of digital technologies.

The key contributions of this study are its insights into the experiences of Indonesian audit firms in digitalizing audit processes and the implications for the Indonesian public sector. The analysis highlights the critical importance of strategic planning, investment in skills development, and careful attention to data security and privacy. Lessons from the private sector emphasize the value of collaboration and effective change management in facilitating the adoption of new technologies. For the Indonesian public sector, the development of a clear and well-funded national strategy to digitize public sector performance audits is essential, with priorities including comprehensive training programs, addressing data quality and interoperability issues, establishing a robust data security framework, and fostering a culture of innovation and continuous improvement through the strategic adoption of digital technologies. These cross-sector findings and recommendations are crucial for enhancing the performance and efficiency of the Indonesian public sector through the effective leveraging of digital audit tools and capabilities.

This study has some limitations: First, It is based solely on the experiences and perspectives of audit firms, not direct engagement with public sector stakeholders. This means the audit firms' views may not fully capture the public sector's challenges and digitalization needs. Secondly, The reliance on online surveys, rather than in-depth interviews, may have limited the depth and nuance of the data collected. Thirdly, there is potential for sample bias, as the participating firms may not be representative of the broader audit industry in Indonesia.These limitations suggest the need for further research that involves

diverse stakeholders and uses a range of data collection methods to better understand the digitalization of public sector performance audits in Indonesia. Additionally, the focus of this study is on the digital transformation of performance audits, so the insights may not apply to other types of audits. More research is needed to explore digitalization across a broader spectrum of organizations and audit domains.

Future research should address the limitations of this study by conducting comparative studies of audit firms and public sector stakeholders, as well as case studies of public institutions to gain a more comprehensive understanding of digitalization in public sector performance audits in Indonesia. Quantitative assessments could also provide insights into the benefits and challenges of adopting digital audit tools and techniques within the public sector. These investigations would help elucidate cross-sector perspectives and provide robust recommendations for enhancing performance and efficiency of the Indonesian public sector through strategic use of digital technologies.

The findings on the digitalization experiences of Indonesian audit firms have significant relevance for strengthening public audit and accountability in Indonesia and other developing countries. The insights highlight the critical need for comprehensive national strategies to digitize public sector performance audits, focusing on developing digital competencies among auditors, addressing data quality and interoperability challenges, and establishing robust data security frameworks. By leveraging expertise and lessons from the private sector, the public sector can more effectively harness the potential of digital audit tools and techniques to enhance efficiency, transparency, and accountability of government operations. These cross-sector learnings are essential for driving meaningful reform and improving overall public sector performance in Indonesia and other developing economies facing similar digitalization challenges.

The findings from the analysis of audit firm experiences in adopting digital audit processes and their implications for the Indonesian public sector suggest several pragmatic and policy-oriented recommendations. For the Indonesian Institute of Public Accountants (IAPI), the professional body should advocate for regulatory updates that support and facilitate the adoption of digital audit techniques. This could involve developing guidelines and standards for the use of data analytics, artificial intelligence, and other digital tools in the audit process. IAPI should also spearhead collaborative efforts to share knowledge, best practices, and training resources among audit firms, accelerating the development of digital skills within the profession.

Indonesian audit firms should persist in prioritizing investments to upskill their auditors in data analytics, information technology, and the application of digital audit tools. Firms should establish dedicated training programs and provide ongoing professional development opportunities to ensure their workforce remains current with the latest digital audit technologies and techniques. Collaboration between firms to pool resources and expertise can help address the challenges in acquiring digitally skilled talent. Crafting a comprehensive national strategy for digitalizing public sector performance audits is critical for the Audit Board of Indonesia. This strategy should focus on establishing robust data governance frameworks, addressing data quality and interoperability challenges across government systems, and building the necessary IT infrastructure to support digital audit tools. Equipping public sector auditors with targeted training programs to develop their digital competencies should be a key priority. Additionally, engaging with stakeholders to review and update the regulatory environment is essential to enable the adoption of digital audit techniques.

References

Agustina, I., & Indrayani, E. (2020). The role of internal and external factors on audit quality. *Jurnal Manajemen dan Keuangan*, *9*(1), 73. https://doi.org/10.33059/jmk.v9i1.2481

Ahmadi, S. (2024). A comprehensive study on integration of big data and AI in financial industry and its effect on present and future opportunities. *International Journal of Current Science Research and Review*, *7*(1). https://doi.org/10.47191/ijcsrr/v7-i1-07

Alam, N., Gupta, L., & Zameni, A. (2019). Fintech regulation. In *Springer eBooks* (p. 137). Springer Nature. https://doi.org/10.1007/978-3-030-24666-2_8

Al-Faruqi, R. A. (2020). Pengaruh profitabilitas, leverage, komite audit dan kompleksitas audit terhadap audit delay. *Jurnal REKSA: Rekayasa Keuangan, Syariah dan Audit*, *7*(1), 25. https://doi.org/10.12928/j.reksa.v7i1.2264

Ali, H., Zain, M. Z., Hashmi, H. S., Abbas, M. H., Shahid, M. W., & Tariq, U. (2018). Awareness and knowledge of fintech among Islamic Banking and Finance students in Pakistan. *Islamic Banking and Finance Review*, *5*(1), 1. https://doi.org/10.32350/ibfr.2018.05.01

Al-Khasawneh, R. O. (2022). Challenges facing external auditor while auditing banking accounting systems in the light of the use of digital technologies of Fourth Industrial Revolution in Jordan. *American Journal of Industrial and Business Management*, *12*(4), 672. https://doi.org/10.4236/ajibm.2022.124035

Alles, M. (2015). Drivers of the use and facilitators and obstacles of the evolution of big data by the audit profession. *Accounting Horizons*, *29*(2), 439. https://doi.org/10.2308/acch-51067

Alles, M., & Gray, G. L. (2019). Will the medium become the message? A framework for understanding the coming automation of the audit process. *Journal of Information Systems*, *34*(2), 109. https://doi.org/10.2308/isys-52633

Alqudah, H. M., Amran, N. A., & Hassan, H. (2019). Factors affecting the internal auditors' effectiveness in the Jordanian public sector: The moderating effect of task complexity. *EuroMed Journal of Business*, *20*(5). https://doi.org/10.1108/EMJB-03-2019-0049

Aminah, S., & Saksono, H. (2021). Digital transformation of the government: A case study in Indonesia. *Jurnal Komunikasi: Malaysian Journal of Communication*, *37*(2), 272. https://doi.org/10.17576/jkmjc-2021-3702-17

Andrews, P., Sousa, T. de, Haefele, B., Beard, M., Wigan, M. R., Palia, A., Reid, K. B., Narayan, S., Dumitru, M., Morrison, A., Mason, G., & Jacquet, A. (2022). A trust framework for government use of artificial intelligence and automated decision making. *arXiv*. https://doi.org/10.48550/arXiv.2208.10087

Apandi, R. N. N., Sofia, A., & Zulhaimi, H. (2022). Good audit planning practices in the digital era. *Advances in Economics, Business and Management Research*, *654*, Article 17. https://doi.org/10.2991/aebmr.k.220701.017

Appelbaum, D., Kogan, A., Vasarhelyi, M. A., & Yan, Z. (2017). Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems*, *25*, 29. https://doi.org/10.1016/j.accinf.2017.03.003

Arner, D. W., Barberis, J., & Buckley, R. P. (2017). FinTech and RegTech in a nutshell, and the future in a sandbox. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3088303

Aswar, K., Ermawati, E., & Julianto, W. (2021). Implementation of accrual accounting by the Indonesian central government: An investigation of social factors. *Public and Municipal Finance*, *10*(1), 151. https://doi.org/10.21511/pmf.10(1).2021.12

Baldwin, R. (2025). *Best practices for state and local government auditors*. https://www.aicpa-cima.com/professional-insights/article/best-practices-for-state-and-local-government-auditors

Batista, P. M., & Ringe, W.-G. (2020). Dynamism in financial market regulation: Harnessing regulatory and supervisory technologies. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3711618

Bazarbash, M. (2019). Fintech in financial inclusion: Machine learning applications in assessing credit risk. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3404066

Beckmerhagen, I. A., Berg, H. P., Karapetrović, S., & Willborn, W. (2004). On the effectiveness of quality management system audits. *The TQM Journal*, *16*(1), 14. https://doi.org/10.1108/09544780410511443

Berghout, E., Fijneman, R., Hendriks, L., de Boer, M., & Butijn, B.-J. (2022). *Advanced digital auditing*. In *Progress in IS*. Springer International Publishing. https://doi.org/10.1007/978-3-031-11089-4

Bini, M. (2019). Models of mandate in public audit: An examination of Australian jurisdictions. *Public Money & Management*, *39*, 201. https://doi.org/10.1080/09540962.2018.1535028

Bouke, M. A., Abdullah, A., ALshatebi, S. H., Atigh, H. E., & Cengiz, K. (2023). African Union Convention on Cyber Security and Personal Data Protection: Challenges and future directions. *arXiv*. https://doi.org/10.48550/arXiv.2307.01966

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2). https://doi.org/10.1191/1478088706qp063oa

Brommelsiek, W. A., & Tinsley, K. T. (1996, June 9). Environmental and safety audits – A process to improve business performance. *SPE Health, Safety and Environment in Oil and Gas Exploration and Production Conference*. https://doi.org/10.2118/35933-ms

Caiden, G. E., & Caiden, N. (1998). Approaches and guidelines for monitoring, measuring and evaluating performance in public sector programs. *Korean Review of Public Administration*, *3*(2), 7. https://doi.org/10.1080/12264431.1998.10804907

Castri, S. di, Grasser, M., & Kulenkampff, A. (2018). Financial authorities in the era of data abundance: Regtech for regulators and Suptech solutions. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3249283

Chambers, A., & Rand, G. K. (2012). Approaches to operational auditing (p. 1). https://doi.org/10.1002/9781119991083.ch1

Chu, M. K., & Yong, K. O. (2021). Big data analytics for business intelligence in accounting and audit. *Open Journal of Social Sciences*, *9*(9), 42. https://doi.org/10.4236/jss.2021.99004

Cîmpan, M., Păcuraru-Ionescu, C.-P., & Borlea, S. N. (2023). The value of public audit: Theories and empirical evidence. *Journal of Financial Studies*, *8*(14), 24. https://doi.org/10.55654/jfs.2023.8.14.2

Cordery, C. J., Goncharenko, G., Polzer, T., McConville, D., & Belal, A. R. (2023). NGOs' performance, governance, and accountability in the era of digital transformation. *The British Accounting Review*, *55*(5), Article 101239. https://doi.org/10.1016/j.bar.2023.101239

Crouhy, M., Galai, D., & Wiener, Z. (2021). The impact of fintechs on financial intermediation: A functional approach. *The Journal of FinTech*, *1*(1), 2031001. https://doi.org/10.1142/s270510992031001x

Cunanan, A. L. M., Panergo, S. A. M., Pua, M. L. C., Sandoval, S. C. R., & Soliven, A. S. O. (2022). Where is the force?: Mismatches and contradictions with post-disaster recovery and rehabilitation task forces. *International Journal of Disaster Management*, *5*(2), 109. https://doi.org/10.24815/ijdm.v5i2.26065

Dempsey, K., & van Dyk, V. (2024). The role of data analytics in enhancing external audit quality. In *Springer proceedings in business and economics* (p. 399). Springer International Publishing. https://doi.org/10.1007/978-3-031-46177-4_22

Digital public infrastructure for digital governments. (2024). In *Public governance policy papers*. https://doi.org/10.1787/ff525dc8-en

Ding, X., Wang, H., Gao, Y., Li, J., & Gao, H. (2017). Efficient currency determination algorithms for dynamic data. *Tsinghua Science & Technology*, *22*(3), 227. https://doi.org/10.23919/tst.2017.7914196

Ellul, L., & Buttigieg, R. (2021). Benefits and challenges of applying data analytics in government auditing. *Journal of Accounting Finance and Auditing Studies*, *7*(3), 1. https://doi.org/10.32602/jafas.2021.017

Elsayed, A. (2017). Common fraud detections methods. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3042827

Eze, N. M., & Ibrahim, M. M. (2015). Value for money audit: A veritable tool for expenditure management. *International Journal of Financial Research*, *6*(3). https://doi.org/10.5430/ijfr.v6n3p150

Fauziah, F., Novita, N., & Fambudi, I. N. (2024). The role of institutional ownership in moderating ESG disclosure's impact on firm value. *Jurnal REKSA: Rekayasa Keuangan Syariah dan Audit*, *11*(2), 108. https://doi.org/10.12928/jreksa.v11i2.10534

Fedyk, A., Hodson, J., Khimich, N. V., & Fedyk, T. (2022). Is artificial intelligence improving the audit process? *Review of Accounting Studies*, *27*(3), 938. https://doi.org/10.1007/s11142-022-09697-x

Flick, U. (1998). *An introduction to qualitative research*. http://ci.nii.ac.jp/ncid/BB14980167

Fotoh, L. E., & Lorentzon, J. (2022). Audit digitalization and its consequences on the audit expectation gap: A critical perspective. *Accounting Horizons*, *37*(1), 43. https://doi.org/10.2308/horizons-2021-027

Friedlich, M. (2024). *Audit's digital revolution: How technology is reshaping the industry*. https://www.wolterskluwer.com/en/expert-insights/audits-digital-revolution-how-technology-is-reshaping-the-industry

Gao, X. (2024). Unlocking the path to digital financial accounting: A study on Chinese SMEs and startups. *Global Finance Journal, 61*, 100970. https://doi.org/10.1016/j.gfj.2024.100970

Gingerich, B. S. (2002). Effective auditing: Approach to external and internal audits. *Home Health Care Management & Practice, 14*(4), 303–310. https://doi.org/10.1177/1084822302014004011

Giovani, M., Sheren, S., & Pratama, V. T. (2023). Analisis kesesuaian indikator kualitas audit Indonesia dengan kerangka kerja kualitas audit dari International Auditing and Assurance Standards Board (IAASB). *SINOMIKA: Journal Publikasi Ilmiah Bidang Ekonomi dan Akuntansi, 1*(5), 1181–1190. https://doi.org/10.54443/sinomika.v1i5.594

Goodman, L. A. (1961). Snowball sampling. *The Annals of Mathematical Statistics, 32*(1), 148–170. https://doi.org/10.1214/aoms/1177705148

Halai, A., Halai, V., Hrechaniuk, R., & Datsko, K. (2021). Digital anti-corruption tools and their implementation in various legal systems around the world. *SHS Web of Conferences, 100*, 03005. https://doi.org/10.1051/shsconf/202110003005

Haliah, H., Nirwana, S., & Akhzan, F. H. (2020). Role of performance audit in public sector organization. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3743077

Harrell, A. J., & Barbacci, J. (2018). Government auditing: Foundation and ethical principles. In *The Yellow Book*. https://doi.org/10.1002/9781119512448.ch1

Harsanto, H., Sandradewi, K., Kusumaningrum, A., & Pradana, A. I. (2022). Implications of information technology on performance of business management through a remote audit approach to audit quality. *International Journal of Economics, Business and Accounting Research (IJEBAR), 6*(1), 416–426. https://doi.org/10.29040/ijebar.v6i1.4831

Heeks, R. (2002). Information systems and developing countries: Failure, success, and local improvisations. *The Information Society, 18*(2), 101–112. https://doi.org/10.1080/01972240290075039

Heinrich, C. J. (2008). Advancing public sector performance analysis. *Applied Stochastic Models in Business and Industry, 24*(5), 373–384. https://doi.org/10.1002/asmb.725

Hu, C., & Yang, X. (2024). A study on the impact of digital governance on disclosure quality of listed companies. *Finance Research Letters, 69*, 106062. https://doi.org/10.1016/j.frl.2024.106062

Igibayeva, Z. (2020). The impact of internal public audit on the use of public resources. *Advances in Economics, Business and Management Research*, *Advances in Economics, Business and Management Research*. https://doi.org/10.2991/aebmr.k.200312.482

Ikudabo, A. O., & Kumar, P. (2024). AI-driven risk assessment and management in banking: Balancing innovation and security. *International Journal of Research Publication and Reviews, 5*(10), 3573–3583. https://doi.org/10.55248/gengpi.5.1024.2926

Ismail, A. H., Merejok, N. B. M., Dangi, M. R. M., & Saad, S. (2019). Does audit quality matter in Malaysian public sector auditing? *International Journal of Financial Research, 10*(3), 203–212. https://doi.org/10.5430/ijfr.v10n3p203

Jackson, P. M. (1993). Public service performance evaluation: A strategic perspective. *Public Money & Management, 13*(4), 9–16. https://doi.org/10.1080/09540969309387783

Jagtiani, J., & John, K. (2018). Fintech: The impact on consumers and regulatory responses. *Journal of Economics and Business, 100*, 1–6. https://doi.org/10.1016/j.jeconbus.2018.11.002

Janvrin, D., & Mascha, M. F. (2014). The financial close process: Implications for future research. *International Journal of Accounting Information Systems, 15*(4), 383–402. https://doi.org/10.1016/j.accinf.2014.05.007

Kacanski, S. (2016). ICT in auditing: Impact of audit quality norms on interpersonal interactions. *European Financial and Accounting Journal, 11*(4), 39–50. https://doi.org/10.18267/j.efaj.173

Kamara, A. K. (2023). An assessment of the effectiveness of the internal audit on the performance of the public sector: Case study of the National Revenue Authority (NRA). *OALib, 10*(8), 1–12. https://doi.org/10.4236/oalib.1110432

Knechel, W. R. (2016). Audit quality and regulation. *International Journal of Auditing, 20*(3), 215–223. https://doi.org/10.1111/ijau.12077

Kokina, J., Blanchette, S., Davenport, T. H., & Pachamanova, D. A. (2025). Challenges and opportunities for artificial intelligence in auditing: Evidence from the field. *International Journal of Accounting Information Systems, 56*, 100734. https://doi.org/10.1016/j.accinf.2025.100734

Kou, G., & Lu, Y. (2025). FinTech: A literature review of emerging financial technologies and applications. *Financial Innovation, 11*(1), Article 6. https://doi.org/10.1186/s40854-024-00668-6

Kreuter, F., Ghani, R., & Lane, J. (2019). Change through data: A data analytics training program for government employees. *Harvard Data Science Review*. https://doi.org/10.1162/99608f92.ed353ae3

Kurniawan, D., & Arti, R. M. (2020). Comparative study of a cybersecurity curriculum to support digital transformation in the public sector. *IAPA Proceedings Conference*, 547–556. https://doi.org/10.30589/proceedings.2020.427

Kwanbo, L. M. (2010). Fiscal transparency and accountability in governance: The role of local government audit. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1583182

Lamboglia, R., Lavorato, D., Scornavacca, E., & Za, S. (2020). Exploring the relationship between audit and technology: A bibliometric analysis. *Meditari Accountancy Research, 29*(5), 1233–1255. https://doi.org/10.1108/medar-03-2020-0836

Lee, R. T., & Novac, M. (2014). Using audits to improve supply chain performance. *Journal of Corporate Accounting & Finance, 25*(4), 45–53. https://doi.org/10.1002/jcaf.21954

Leng, A., & Zhang, Y. (2024). The effect of enterprise digital transformation on audit efficiency—Evidence from China. *Technological Forecasting and Social Change, 201*, 123215. https://doi.org/10.1016/j.techfore.2024.123215

Leocádio, D., Malheiro, L., & Reis, J. (2024). Artificial intelligence in auditing: A conceptual framework for auditing practices. *Administrative Sciences, 14*(10), 238. https://doi.org/10.3390/admsci14100238

Leonov, P. Y., Kozhina, A. D., Леонова, Е. М., Epifanov, M., & Sviridenko, A. (2020). Visual analysis in identifying a typical indicators of financial statements as an element of artificial intelligence technology in audit. *Procedia Computer Science, 169*, 710–717. https://doi.org/10.1016/j.procs.2020.02.174

Lestari, D., Mardian, S., & Firman, M. A. (2020). Why don't auditors use computer-assisted audit techniques? Study at small public accounting firms. *The Indonesian Accounting Review, 10*(2), 105–116. https://doi.org/10.14414/tiar.v10i2.1974

Liu, Y., Liu, Q., & Wei, Y. (2025). Digital finance, internal control, and audit quality. *Finance Research Letters*, 107033. https://doi.org/10.1016/j.frl.2025.107033

Lois, P., Drogalas, G., Karagiorgos, A., & Tsikalakis, K. (2020). Internal audits in the digital era: Opportunities, risks and challenges. *EuroMed Journal of Business, 15*(2), 205–222. https://doi.org/10.1108/emjb-07-2019-0097

Loke, C. H., Ismail, S., & Hamid, A. (2016). The perception of public sector auditors on performance audit in Malaysia: An exploratory study. *Asian Review of Accounting, 24*(1), 90–111. https://doi.org/10.1108/ara-12-2013-0082

Lombardi, D. R., Bloch, R., & Vasarhelyi, M. A. (2014). The future of audit. *Journal of Information Systems and Technology Management, 11*(1), Article e201411001. https://doi.org/10.4301/s1807-17752014000100002

Lu, L., Bo, W., & Qin, L. (2024). Spillover effect of digital transformation along the supply chain: From the perspective of suppliers' audit fees. *China Journal of Accounting Research*, 100363. https://doi.org/10.1016/j.cjar.2024.100363

Luan, F., Zhang, Z., & Chen, Y. (2024). Audit quality and digitalisation in shaping firm innovation strategy: Evidence from China. *Technology in Society*, 102807. https://doi.org/10.1016/j.techsoc.2024.102807

Luborsky, M., & Rubinstein, R. L. (1995). Sampling in qualitative research. *Research on Aging, 17*(1), 89–113. https://doi.org/10.1177/0164027595171005

Manita, R., Elommal, N., Baudier, P., & Hikkerova, L. (2019). The digital transformation of external audit and its impact on corporate governance. *Technological Forecasting and Social Change, 150*, 119751. https://doi.org/10.1016/j.techfore.2019.119751

Marsely, M. (2020). Does audit quality affect client satisfaction of non profit organization in Indonesia? https://doi.org/10.2991/aebmr.k.200415.023

Masood, A., & Lodhi, R. N. (2015). Factors affecting the success of government audits: A case study of Pakistan. *Universal Journal of Management, 3*(2), 52–58. https://doi.org/10.13189/ujm.2015.030202

Meiryani, M., Sujanto, M., Lindawati, A., Zulkarnain, A., & Liawatimena, S. (2021). Auditor's perception on technology transformation: Blockchain and CAATs on audit quality in Indonesia. *International Journal of Advanced Computer Science and Applications, 12*(8), 399–407. https://doi.org/10.14569/ijacsa.2021.0120861

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. http://digitallib.pps.unj.ac.id/index.php?p=show_detail&id=27892&keywords=

Mhlanga, D. (2024). The role of big data in financial technology toward financial inclusion. *Frontiers in Big Data, 7*, Article 1184444. https://doi.org/10.3389/fdata.2024.1184444

Mihiotis, A., & Konidaris, N. F. (2006). Internal auditing: An essential tool for adding value and improving the operations of financial institutions and organisations. *International Journal of Financial Services Management, 2*(2), 75–84. https://doi.org/10.1504/ijfsm.2007.011673

Mirza, N., Elhoseny, M., Umar, M., & Metawa, N. (2023). Safeguarding FinTech innovations with machine learning: Comparative assessment of various approaches. *Research in International Business and Finance, 66*, 102009. https://doi.org/10.1016/j.ribaf.2023.102009

Najam, B., & Ghazal, S. (2022). A qualitative exploration of the outcome expectations in determining career choices of college students. *Pakistan Journal of Humanities and Social Sciences, 10*(1), 25–35. https://doi.org/10.52131/pjhss.2022.1001.0183

Navarro, C., Nepomuceno, J., Pascua, M. M. C., Rayos, R. A. U., & Balaria, F. E. (2023). An analysis of the adaptation of electronic new government accounting system (eNGAS) among government agencies in Nueva Ecija. *International Journal of Advanced Engineering Management and Science, 9*(6), 41–47. https://doi.org/10.22161/ijaems.96.8

Nezhyva, M., & Міняйло, B. (2020). Digitalization of audit in the conditions of the Covid-19. *Herald of Kyiv National University of Trade and Economics, 131*(3), 123–132. https://doi.org/10.31617/visnik.knute.2020(131)09

Nguyen, A. H., Ha, H. H., & Soa, N. L. (2020). Determinants of information technology audit quality: Evidence from Vietnam. *Journal of Asian Finance, Economics and Business, 7*(4), 41–52. https://doi.org/10.13106/jafeb.2020.vol7.no4.41

Nirupa, P., & van V. Mark, J. (2012). Performance auditing: Development of an audit model to evaluate efficiency, effectiveness and economy of the performance of a business. *African Journal of Business Management, 6*(39), 10417–10428. https://doi.org/10.5897/ajbm12.329

Nwankpa, J. K. (2014). Digital business environment and audit quality. *International Journal of Accounting Research, 2*(1), 1–9. https://doi.org/10.4172/2472-114x.1000114

Okab, R. (2013). Electronic audit role in achieving competitive advantages and support the strategy of the external audit in auditing offices in the Hashemite Kingdom of Jordan. *International Business Research, 6*(6), 181–191. https://doi.org/10.5539/ibr.v6n6p181

Oladejo, M. T., & Jack, L. (2020). Fraud prevention and detection in a blockchain technology environment: Challenges posed to forensic accountants. *International Journal of Economics and Accounting, 9*(4), 315–329. https://doi.org/10.1504/ijea.2020.110162

Oldhouser, M. C. (2016). The effects of emerging technologies on data in auditing. https://scholarcommons.sc.edu/cgi/viewcontent.cgi?article=1069&context=senior_theses

Omoteso, K. (2016a). *Audit effectiveness: Meeting the IT challenge*. Routledge. http://ci.nii.ac.jp/ncid/BB13066308

Omoteso, K. (2016b). *Audit effectiveness: Meeting the IT challenge*. Routledge. https://doi.org/10.4324/9781315568294

Perri, D., & Bellamy, C. (2012). Types of research design. In SAGE Publications Ltd eBooks (p. 69). SAGE Publishing. https://doi.org/10.4135/9781446288047.n6

Pham, Q. H., & Vu, K. P. (2025). Unveiling how blockchain-based internal auditing practices impact SDG 8 achievement? Mediating role of digital green corporate social responsibility. *Research in Economics, 79*(3), Article 101057. https://doi.org/10.1016/j.rie.2025.101057

Pizzi, S., Venturelli, A., Variale, M., & Macario, G. P. (2021). Assessing the impacts of digital transformation on internal auditing: A bibliometric analysis. *Technology in Society, 67*, 101738. https://doi.org/10.1016/j.techsoc.2021.101738

Popoola, O. M. J., Ahmad, A. C., & Samsudin, R. S. (2015). Forensic accountant and auditor knowledge and skills requirements for task performance fraud risk assessment in the Nigerian public sector [Data set]. Figshare. https://doi.org/10.6084/m9.figshare.1534524

Prastyatini, S. L. Y., & Galaa, A. E. (2023). The role of income level in predicting taxpayer compliance: The attribution theory and technology acceptance model approach. *Jurnal REKSA: Rekayasa Keuangan, Syariah Dan Audit, 10*(2), 7–15. https://doi.org/10.12928/jreksa.v10i2.7806

Pratama, M. R., Tualeka, S. H., & Prasetya, A. (2024). Symphony of digital public service innovation in Indonesia: Evidence from Indonesia public service innovation competition 2014–2022. *Jurnal Studi Pemerintahan*. https://doi.org/10.18196/jsp.v15i1.342

Purnamasari, P., & Hartanto, R. (2022). Effectiveness of e-audit implementation in the Indonesian audit board. *KnE Social Sciences*, Article 12333. https://doi.org/10.18502/kss.v0i0.12333

Purnamasari, P., Amran, N. A., & Hartanto, R. (2022). Modelling computer assisted audit techniques (CAATs) in enhancing the Indonesian public sector. *F1000Research, 11*, 559. https://doi.org/10.12688/f1000research.121674.1

Purnamasari, R., Hasanudin, A. I., Zulfikar, R., & Yazid, H. (2024). Do internal control and information systems drive sustainable rural development in Indonesia? *Journal of Open Innovation Technology Market and Complexity, 10*(1), 100242. https://doi.org/10.1016/j.joitmc.2024.100242

Putri, A. N., & Retnosari, R. (2023). Akuntansi Sektor Publik Untuk Mencegah Fraud Pada Sektor Publik Di Era Digital. *Jurnal Maneksi, 12*(1), 99. https://doi.org/10.31959/jm.v12i1.1401

Qoshidah, M., Nurrahmawati, A., & Norizanb, S. B. (2025). Good Governance and Ethical Value: Are They Sync in Harmony? *Jurnal REKSA Rekayasa Keuangan, Syariah Dan Audit, 12*(1), 19. https://doi.org/10.12928/jreksa.v12i1.10721

Rakhman, F., & Wijayana, S. (2024). Human development and the quality of financial reporting among the local governments in Indonesia. *Journal of International Accounting Auditing and Taxation, 56*, 100634. https://doi.org/10.1016/j.intaccaudtax.2024.100634

Rana, T., Steccolini, I., Bracci, E., & Mihret, D. G. (2021). Performance auditing in the public sector: A systematic literature review and future research avenues. *Financial Accountability and Management, 38*(3), 337. https://doi.org/10.1111/faam.12312

Reichborn-Kjennerud, K., González, B., Bracci, E., Carrington, T., Hathaway, J. C., Jeppesen, K. K., & Steccolini, I. (2019). Sais work against corruption in Scandinavian, South-European and African countries: An institutional analysis. *The British Accounting Review, 51*(5), 100842. https://doi.org/10.1016/j.bar.2019.100842

Robinson, R. S. (2014). Purposive Sampling. In *Springer eBooks* (p. 5243). Springer Nature. https://doi.org/10.1007/978-94-007-0753-5_2337

Rodríguez-Quintero, J.-F., Sánchez-Díaz, A., Iriarte-Navarro, L., Maté, A., Such, M. M., & Trujillo, J. (2021). Fraud Audit Based on Visual Analysis: A Process Mining Approach. *Applied Sciences, 11*(11), 4751. https://doi.org/10.3390/app11114751

Rosalika, D. N., Fauziah, N., & Sari, M. R. (2024). Financial Ratios on Reducing Financial Distress Moderated by ESG Disclosure. *Jurnal REKSA Rekayasa Keuangan Syariah Dan Audit, 11*(2), 122. https://doi.org/10.12928/jreksa.v11i2.10739

Roszkowska, P. (2020). Fintech in financial reporting and audit for fraud prevention and safeguarding equity investments. *Journal of Accounting & Organizational Change, 17*(2), 164. https://doi.org/10.1108/jaoc-09-2019-0098

Ruiz, L., Benitez, J., Castillo, A., & Braojos, J. (2024). Digital human resource strategy: Conceptualization, theoretical development, and an empirical examination of its impact on firm performance. *Information & Management, 61*(4), 103966. https://doi.org/10.1016/j.im.2024.103966

Saadah, M. A., Erida, E., & Syeftiani, T. (2023). Transforming Village Governance: What does it Take to Turn into Digital. In *Advances in Social Science, Education and Humanities Research* (p. 119). https://doi.org/10.2991/978-2-38476-174-6_21

Sabani, A., Farah, M. H., & Dewi, D. R. S. (2019). Indonesia in the Spotlight: Combating Corruption through ICT enabled Governance. *Procedia Computer Science, 161*, 324. https://doi.org/10.1016/j.procs.2019.11.130

Saifullah, S., Saifullah, S., Madaling, & Hafid, L. (2019). Implementation of E-Government and Public Service in Sidenreng Rappang Regency: Study of Village Website in Bulo Wattang, Carawali, Kanie, and Lagading Village. https://doi.org/10.2991/icdesa-19.2019.23

Septiana, N. I., Swandaru, R., & Hudaefi, F. A. (2024). Public Sentiment on Sustainable Finance and Implications for Islamic Banks. *Jurnal REKSA Rekayasa Keuangan Syariah Dan Audit, 11*(2), 90. https://doi.org/10.12928/jreksa.v11i2.10441

Serpeninova, Y., Макаренко, I., & Lytvynova, M. (2019). Computer-assisted audit techniques: Main advantages and disadvantages. *Vìsnik Sums'kogo Deržavnogo Unìversitetu*, *3*, 53. https://doi.org/10.21272/1817-9215.2019.3-7

Seyam, A., Hinners, A., Freire, L., & Parbat, V. (2016). The timeliness of state and local governments by GASB: An evaluation of efficacy of financial reports. *Journal of Accounting & Marketing*, *5*(3). https://doi.org/10.4172/2168-9601.1000184

Shaikh, H., Jokhio, M. U., Maher, Z. A., Chandio, S., Manirajah, M., Abdullah, B., Raza, A., Shah, A. S., & Shah, A. (2018). Beyond traditional audits: The implications of information technology on auditing. *International Journal of Engineering & Technology*, *7*, 5. https://doi.org/10.14419/ijet.v7i2.34.13897

Shorten, A., & Moorley, C. (2014). Selecting the sample. *Evidence-Based Nursing*, *17*(2), 32. https://doi.org/10.1136/eb-2014-101747

Soh, C., & Sia, S. K. (2004). An institutional perspective on sources of ERP package–organisation misalignments. *The Journal of Strategic Information Systems*, *13*(4), 375–397. https://doi.org/10.1016/j.jsis.2004.11.001

Suandi, A. B., & Asrimiyanti, R. (2025). Selective disclosure: Exploring web-based accountability strategies of charitable NPOs in Indonesia. *Jurnal REKSA Rekayasa Keuangan, Syariah dan Audit*, *12*(1), 1. https://doi.org/10.12928/jreksa.v12i1.12965

Sudrajat, G. A. (2021). The acceleration of digital transformation in the Ministry of Finance: What are the driven factors? *IAPA Proceedings Conference*, 45. https://doi.org/10.30589/proceedings.2021.514

Sun, H., Rabbani, M. R., Sial, M. S., Yu, S., Filipe, J., & Cherian, J. (2020). Identifying big data's opportunities, challenges, and implications in finance. *Mathematics*, *8*(10), 1738. https://doi.org/10.3390/math8101738

Sun, M., & Qu, Y. (2020). IT audit education implemented under the cloud accounting. https://doi.org/10.2991/assehr.k.200801.009

Sun, Y., Li, J., Lu, M., & Guo, Z. (2024). Study of the impact of the big data era on accounting and auditing. *Frontiers in Business Economics and Management*, *13*(3), 44. https://doi.org/10.54097/0fa7xk79

Syahidin, Y. (2021). Digital sector innovation to support less contact economy in Indonesia. *Advances in Engineering Research*. https://doi.org/10.2991/aer.k.210810.070

Teeter, R. A., Alles, M., & Vasarhelyi, M. A. (2010). The remote audit. *Journal of Emerging Technologies in Accounting*, *7*(1), 73–90. https://doi.org/10.2308/jeta.2010.7.1.73

Tekaya, B., Feki, S. E., Tekaya, T., & Masri, H. (2020). Recent applications of big data in finance. https://doi.org/10.1145/3423603.3424056

The role of technology in auditing. (2024). In *Internal Auditing*. https://ecampusontario.pressbooks.pub/internalauditing/chapter/08-04-the-role-of-technology-in-auditing/

Thompson, D. (2018). Contemporary challenges in audit. In *Springer eBooks* (p. 125). Springer Nature. https://doi.org/10.1007/978-3-319-91113-7_7

Tricahyono, N. S., Aviva, I. Y., & Hasnita, H. (2024). The impact of QRIS convenience on non-cash transaction satisfaction: The role of usage as an intervening factor. *Jurnal REKSA Rekayasa Keuangan Syariah dan Audit*, *11*(1), 29. https://doi.org/10.12928/jreksa.v11i1.10116

Tysiac, K. (2022). Embracing technology in the audit. *Journal of Accountancy*. https://www.journalofaccountancy.com/issues/2022/feb/embracing-technology-audit.html

Udeh, E. O., Amajuoyi, P., Adeusi, K. B., & Scott, A. O. (2024). The role of big data in detecting and preventing financial fraud in digital transactions. *World Journal of Advanced Research and Reviews, 22*(2), 1746. https://doi.org/10.30574/wjarr.2024.22.2.1575

UNDP Digital Leadership Learning Modules. (2024). https://www.undp.org/publications/undp-digital-leadership-learning-modules

Vasarhelyi, M. A., & Romero, S. (2014). Technology in audit engagements: A case study. *Managerial Auditing Journal, 29*(4), 350–367. https://doi.org/10.1108/maj-06-2013-0881

Vasarhelyi, M. A., Alles, M., Kuenkaikaew, S., & Littley, J. (2012). The acceptance and adoption of continuous auditing by internal auditors: A micro analysis. *International Journal of Accounting Information Systems, 13*(3), 267–281. https://doi.org/10.1016/j.accinf.2012.06.011

Vijayagopal, P., Jain, B., & Viswanathan, S. A. (2024). Regulations and fintech: A comparative study of the developed and developing countries. *Journal of Risk and Financial Management, 17*(8), 324. https://doi.org/10.3390/jrfm17080324

Virnandes, S. R., Shen, J., & Vlahu-Gjorgievska, E. (2024). Building public trust through digital government transformation: A qualitative study of Indonesian civil service agency. *Procedia Computer Science, 234*, 1183–1192. https://doi.org/10.1016/j.procs.2024.03.114

Vitali, S., & Giuliani, M. (2024). Emerging digital technologies and auditing firms: Opportunities and challenges. *International Journal of Accounting Information Systems, 53*, 100676. https://doi.org/10.1016/j.accinf.2024.100676

Volodina, T., & Grossi, G. (2024). Digital transformation in public sector auditing: Between hope and fear. *Public Management Review*. Advance online publication. https://doi.org/10.1080/14719037.2024.2402346

Wang, Y. (2023). Application of machine learning models in detecting financial fraud in publicly traded companies. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4635606

Webb, M. (2019). Seeking signs of transparency: Audit, materiality, and monuments to active citizenship in New Delhi. *Journal of the Royal Anthropological Institute, 25*(3), 698–715. https://doi.org/10.1111/1467-9655.13129

Widyaningsih, I. A., Harymawan, I., Mardijuwono, A. W., Ayuningtyas, E. S., & Larasati, D. A. (2019). Audit firm rotation and audit quality: Comparison before vs after the elimination of audit firm rotation regulations in Indonesia. *Cogent Business & Management, 6*(1), Article 1695403. https://doi.org/10.1080/23311975.2019.1695403

Wylde, V., Rawindaran, N., Lawrence, J., Balasubramanian, R., Prakash, E., Jayal, A., Khan, I., Hewage, C., & Platts, J. (2022). Cybersecurity, data privacy and blockchain: A review [Review of cybersecurity, data privacy and blockchain: A review]. *SN Computer Science, 3*(2), Article 120. https://doi.org/10.1007/s42979-022-01020-4

Xu, H., Niu, K., Lu, T., & Li, S. (2024). Leveraging artificial intelligence for enhanced risk management in financial services: Current applications and future prospects. *Engineering Science & Technology Journal, 5*(8), 2402–2412. https://doi.org/10.51594/estj.v5i8.1363

Yasin, M., Artinah, B., & Mujennah, M. (2019, January 1). Analysis of internal control in enhancing performance's accountability in local government work unit through risk-based audit (ISA). In *Proceedings of the 2nd Padang International Conference on Education, Economics, Business and Accounting (PICEEBA-2 2018)*. https://doi.org/10.2991/piceeba2-18.2019.11

Zhong-qing, H., Ding, S., Li, S., Chen, L., & Yang, S. (2019). Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model. *Symmetry, 11*(3), 340. https://doi.org/10.3390/sym11030340

Editorial Team

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Editorial Address:
Accounting Department, Faculty of Economics and Business, Universitas Ahmad Dahlan
Jl. Kapas No. 9, Semaki, Umbulharjo, Daerah Istimewa Yogyakarta 55166
E-mail : reksa@act.uad.ac.id