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AUDITOR PERCEPTION OF CLOUD TECHNOLOGY-BASED AUDITS

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Abstract

The rapid development of information technology has driven significant transformations in audit practices, one of which is through the adoption of cloud computing technology. This study discusses auditors' perceptions of cloud-based audits, including their views on the benefits, challenges, and professional implications of using the cloud in the audit process. The results of the study indicate that the majority of auditors view cloud technology as a tool that can improve audit efficiency, flexibility, and accuracy, especially through real-time data access and integration with analytical tools. However, on the other hand, concerns also arise regarding data security, technological competence, and dependence on cloud service providers. Differences in the level of readiness between large and small audit firms also affect the adoption pattern of this technology. This study emphasizes the importance of increasing technological literacy among auditors, developing cloud-based audit standards, and institutional support so that digital transformation in audits can take place optimally and sustainably.

Keywords: Auditor perception, audit, cloud technology

INTRODUCTION

The rapid development of technology not only requires organizations to adapt, but also challenges the accounting and auditing profession to continue to move forward (Witte et al., 2022). In the context of external audits, the implementation of cloud-based technology offers great opportunities to innovate work processes. However, this progress also has serious

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consequences, especially in terms of risk management, personal data protection, and changes in the role of auditors as users and evaluators of high-tech systems. Therefore, auditing can no longer be understood solely as a process of collecting and evaluating audit evidence, but also as part of a complex information technology ecosystem (Aljabri & Al-Ansi, 2024). One important aspect of the implementation of cloud technology in auditing is its implications for applicable professional standards and regulations. Currently, a number of international bodies such as the International Auditing and Assurance Standards Board (IAASB) have begun to evaluate the need to revise or adjust audit standards to accommodate digital technology, including cloud computing. This reflects the global recognition that conventional audit approaches are no longer sufficient to address the dynamics of information in the digital era (Thottoli et al., 2022). Auditors are expected to not only understand accounting and auditing principles, but also be able to assess and respond to information technology risks appropriately. However, on the other hand, the implementation of these regulations is not always uniform, especially in developing countries such as Indonesia, which have their own challenges in terms of digital infrastructure and human resource readiness.

Furthermore, the use of the cloud in the audit process also presents significant challenges related to data security and privacy aspects. Auditors must understand that data stored in the cloud is beyond the direct control of the organization, because it is technically managed by a third-party service provider. This raises concerns about potential data leaks, confidentiality breaches, or even unauthorized data manipulation. In this context, the auditor's understanding of general information technology controls and application controls becomes very important. They must be able to evaluate the security of cloud service providers, assess service contracts, and understand the backup, encryption, and data access policies implemented. All of these aspects require auditors to not only master technical skills, but also have sensitivity to legal aspects and professional ethics.

In addition, the readiness of the organization where the auditor works is also an important determinant in forming perceptions of cloud-based audits. Organizations that already have good information technology infrastructure, as well as support employee training and competency development, tend to be more able to adopt cloud technology effectively. On the other hand, organizations that do not yet have a digital knowledge management system, or are still hesitant about the benefits of the cloud, risk being left behind in the era of audit transformation (Şen, 2023). In this case, auditors' perceptions are

greatly influenced by the environment in which they work, both in terms of organizational culture, technology leadership, and internal policies related to digital innovation.

The importance of digital literacy in shaping auditor perception and readiness is also a focus that cannot be ignored. Digital literacy is not only about the ability to use software or understand cloud-based systems technically, but also includes a critical understanding of the social, ethical, and legal impacts of using this technology. In the audit process, auditors who have high digital literacy will find it easier to identify technological risks, evaluate the effectiveness of information system-based internal controls, and communicate with clients who have been well digitized. Therefore, improving auditor digital literacy should be a priority in professional development, either through higher education curricula, ongoing training, or relevant information technology certification (Yahya et al., 2024). In an academic context, studies on auditor perceptions of cloud-based audits open up a wide exploration space, not only from a technical aspect but also from the perspective of organizational behavior, individual psychology, and the dynamics of technology adoption. Perception, as a psychological construct, is the gateway to understanding auditor resistance or acceptance of technological innovation. In-depth research on these perceptions can help identify latent barriers, such as fear of losing control, anxiety about change, or doubts about the reliability of new systems. On the other hand, this study can also reveal factors that support adoption, such as trust in cloud security, ease of use, and perceptions of the added value of technology for audit performance. From all of these explanations, it becomes clear that understanding auditors' perceptions of cloud-based audits is not only important from an academic perspective, but also strategic in supporting an inclusive and sustainable audit transformation. Amid the global push towards digitalization, the audit profession must be able to maintain its relevance and credibility by proactively responding to technological changes. This study is expected to contribute to the growing literature on digital auditing, as well as become a basis for formulating training policies, curriculum development, and regulations that are more responsive to the digital era.

RESEARCH METHOD

This study uses a literature review approach as the main method in exploring auditors' perceptions of cloud-based audits. Literature review was chosen because it allows researchers to collect, review, and analyze various

relevant library sources, both in the form of scientific articles, books, research reports, audit standards, and regulations governing the use of information technology in audit practice. This approach is considered appropriate because the topic raised is still relatively new in the local context, so that mapping of existing knowledge and findings is needed to build a strong theoretical and conceptual basis.

The data collection process was carried out through a systematic search of international and national journals published in the last ten years, focusing on issues related to auditor perceptions, cloud technology, and digital-based audit practices. Researchers also refer to professional standards such as the International Standards on Auditing (ISA) and guidance documents from professional institutions such as the AICPA and IFAC related to the use of technology in audits.

The collected literature was analyzed using a descriptive-qualitative approach, with an emphasis on identifying key themes, research trends, and knowledge gaps relevant to the focus of the study. In analyzing the literature, researchers categorized based on topics such as the benefits and challenges of cloud computing in audit, factors that influence auditor perceptions, and organizational readiness for audit digitalization. This analysis process allows researchers to summarize the views and findings of various previous studies, as well as to compile a critical synthesis of the various existing perspectives. Through this literature review approach, it is hoped that a comprehensive understanding can be obtained regarding how auditor perceptions are formed and developed in the face of cloud-based audit transformation, as well as providing direction for further research and future policy development.

RESULT AND DISCUSSION

Audit and Information Technology Development

The audit transformation triggered by advances in information technology has also driven changes in the overall audit ecosystem. Public Accounting Firms (KAP), as providers of audit services, are now faced with pressure to make significant technology investments in order to maintain competitiveness. Not only in terms of more sophisticated audit software, but also in terms of the integration of automated reporting systems, the use of data analytics, and the development of audit dashboards based on data visualization. Technology has encouraged KAPs to carry out comprehensive operational modernization, while demanding a restructuring of the audit work model that has so far been manual and reactive to be more data-based and

proactive (Bierstaker et al., 2001). This phenomenon is also reflected in the global trend among large audit firms, such as The Big Four (Deloitte, PwC, EY, and KPMG), which have already adopted large-scale digital audit solutions. They utilize integrated cloud-based audit systems and AI (artificial intelligence), such as Deloitte's Argus, EY Helix, and KPMG Clara, which not only function to automate the collection of audit evidence, but also analyze suspicious or unusual client financial behavior patterns. This shows that the future of auditing is moving towards continuous auditing and real-time assurance, where the audit process no longer takes place only once a year, but can run continuously along with the availability of data that is continuously updated automatically (Stoel et al., 2012).

In this context, the existence of technology is no longer just an option, but an unavoidable necessity. Client organizations are increasingly adopting cloud-based ERP systems such as SAP S/4HANA, Oracle Cloud, and Microsoft Dynamics, which store financial and operational data in a digital ecosystem. As a result, auditors must be able to adapt to this technology in order to understand business processes comprehensively and evaluate internal controls effectively. Auditors who do not master analytical tools or cloud systems risk being left behind in terms of audit quality and audit effectiveness. Therefore, technological competence is one of the new benchmarks for the quality of auditor human resources.

Meanwhile, in the context of professional education and training, accounting and audit curricula in universities and professional certification institutions must also respond to this need. Integration is needed between information technology materials and audit theory and practice, such as learning about data analytics, ERP systems, cybersecurity, and information technology governance. These skills are not only important for junior auditors, but also for senior auditors and audit managers who must make strategic decisions based on complex digital data. Thus, the formation of a positive perception of technology can begin from the early stages of education and professional training. However, the process of adopting technology in auditing does not always run smoothly. Many organizations, including small to medium-sized accounting firms, face limitations in terms of funds, infrastructure, and human resources to implement advanced audit technology (N.v & S.y, 2019). Some of them still rely on manual audit systems, which risk producing inefficient or less in-depth audit results. In addition, resistance to change is also a challenge. Auditors who are accustomed to conventional approaches may feel hesitant or unconfident in using new technology,

especially when adequate training or strong management support is not yet available.

Another important aspect is the ethical and professional aspects in facing the digital transformation of audits. Auditors must maintain objectivity and independence even though they are supported by sophisticated automated systems (Otero, 2018). In some cases, the use of technology that is too dominant can create dependency and reduce the auditor's professional judgment. Therefore, it is important for auditors to maintain a balance between the use of technology and the application of ethical principles that are the basis of the audit profession. Technology cannot replace professional judgment, but it can strengthen the auditor's ability to make accurate decisions based on adequate evidence (Havelka & Merhout, 2013). Finally, the development of information technology not only affects the technical audit process, but also expands the role and expectations of the auditor profession. Future auditors are required to not only be financial statement examiners, but also data analysts, technology advisors, and strategic partners in organizational governance. They must be able to provide added value through data-based insights, detect risks more quickly, and assist clients in complying with increasingly complex regulations. In this position, auditors are no longer just auditing the past, but also playing a role in shaping a more transparent, accountable, and sustainable future.

Factors Influencing Auditor Perceptions of Technology

Auditor perceptions of technology are the result of a complex interaction between individual characteristics, organizational environment, socio-professional dynamics, and evolving external expectations. In the context of technology-based audits, especially cloud technology, these perceptions play an important role because they will influence the extent to which auditors can accept, understand, and optimally utilize technology in the audit process. Understanding the factors that shape auditor perceptions is essential to creating a more effective and sustainable technology adoption process (Exploring Auditors' Perceptions of the Usage and Importance of Audit Information Technology - Abou-El-Sood - 2015 - International Journal of Auditing - Wiley Online Library, n.d.). One of the main factors influencing auditor perceptions of technology is the level of technological literacy or what is often referred to as individual technological readiness. Auditors who have prior knowledge and experience in using digital devices, accounting information systems, or cloud-based applications tend to have a more open

and positive attitude towards technological innovation in audits (Factors Influencing Statutory Auditors' Perception of the Role of Artificial Intelligence in Auditing | SpringerLink, n.d.). This readiness is not only determined by formal training, but also by exposure to the digital environment in everyday life. In this case, the younger generation of auditors who are classified as digital natives tend to have a more positive perception than senior auditors who may feel awkward or less confident about technological changes.

In addition to individual factors, the organizational context also plays an important role in shaping auditors' perceptions of technology. An organizational culture that supports innovation and learning will create a conducive working atmosphere for auditors to accept and try new things, including cloud-based audit technology. When management provides full support in the form of training, provision of adequate infrastructure, and incentives for the use of technology, it is likely that auditors will feel more motivated and confident in implementing the technology. Conversely, an organizational environment that is conservative, less supportive of updates, or unresponsive to technological needs tends to produce resistance and negative perceptions of digital change.

Another factor that is no less important is previous experience in using technology in an audit context. Auditors who have successfully used a digital audit system, or who have experienced the real benefits of cloud computing, such as time efficiency, ease of data access, and speed of reporting, will have a more positive perception. These first-hand experiences serve as valuable learning resources and serve as references in assessing the potential success of the technology in the future. Conversely, negative experiences, such as system failures, data security breaches, or technical difficulties during technology-based audits, can cause organizational trauma and worsen the auditor's perception of the same system in the future. The social environment also influences the formation of auditors' perceptions of technology. In many cases, auditors' perceptions are influenced by the opinions of their peers, superiors, and the professional community with which they interact. When the professional environment encourages collaboration and the exchange of information about new technologies, it can form social norms that support technology adoption. The existence of professional figures or figures who serve as role models in using technology also plays a role in encouraging other auditors to adapt. This is in line with the theory of diffusion of innovation, where technology adoption is greatly influenced by the opinions and behavior of opinion leaders in the social environment of users of the technology.

Risk perception is also a significant factor in influencing auditors' attitudes toward technology. The use of technology, including cloud computing, is often accompanied by concerns about data security, regulatory compliance, and the potential loss of control over the audit process. Auditors who have a high risk perception of technology will tend to be more skeptical and reluctant to use new systems, especially when there are no guidelines or security guarantees from the technology provider. Therefore, it is important to develop information security policies, provide education about data protection, and build trust in cloud service providers so that this risk perception can be reduced. Furthermore, regulatory factors and professional standards also play a role in shaping auditors' perceptions of the use of technology. Auditors will tend to feel more confident in using technology when there are clear guidelines, standards, or regulations that justify and direct its use. For example, the existence of standards such as ISA 315 (Revised) which emphasizes the importance of understanding information technology systems in the audit process is an important foundation for auditors in assessing the relevance and importance of technology. When technology is supported by an adequate regulatory framework, auditors not only feel safer in terms of compliance, but also consider that the technology is part of a legitimate professional practice and needs to be adopted (Feliciano & and Quick, 2022).

Technological advances themselves also shape auditor perceptions. When audit technology develops significantly, for example with the emergence of AI-based audit platforms, blockchain, and cloud that are increasingly intuitive and user-friendly, auditors will find it easier to accept and utilize them. Good user experience, easy-to-use interfaces, and the availability of features that help audit work in real terms will encourage positive perceptions of technology. On the other hand, if the technology offered is considered complex, confusing, or does not match practical needs in the field, then negative perceptions will be formed, even though the technology theoretically promises higher efficiency (Feliciano & and Quick, 2022).

In practice, these factors do not work separately, but interact with each other and shape auditor perceptions holistically. For example, an auditor who has high technological readiness may still be reluctant to use a cloud audit system if the organizational environment does not support it or if the perception of security risks is too high. Likewise, auditors who were previously skeptical could turn into technology supporters after receiving training, management support, and positive experiences in using it (Hasas Yeghaneh,

2015). Therefore, competency development and technology adoption strategies must consider all of these aspects comprehensively.

Overall, auditors' perceptions of technology are a reflection of various dynamic and contextual factors. Understanding these factors is critical, especially for audit organizations, policy makers, and technology developers who want to drive effective adoption of modern audit systems. By considering aspects of individual readiness, organizational support, user experience, social norms, risk perception, and technological and regulatory developments, the audit transformation process towards a cloud-based digital era can be smoother and more widely accepted by audit professionals.

Literature Findings on Cloud-Based Audit

Cloud-based auditing is a phenomenon that is gaining increasing attention in the accounting and auditing literature, along with the increasing adoption of cloud technology in the business and professional services sectors. Cloud computing allows auditors to access audit data, supporting documents, and audit software via the internet, without having to rely on local hardware. This transformation opens up new opportunities for conducting audits that are more flexible, efficient, and responsive to the dynamics of the organization being audited. In the literature review, cloud-based auditing has been studied from various perspectives, ranging from operational efficiency, supervisory effectiveness, to implications for audit independence and quality (Huson et al., 2025). Several studies have shown that the use of cloud technology in auditing can improve auditor work efficiency through faster data access and better collaboration across locations. Research conducted by (Appelbaum & Nehmer, 2020) suggests that cloud computing provides strategic advantages in terms of real-time data availability and automation of audit processes, such as transaction testing, trend analysis, and internal control monitoring. Auditors no longer need to wait for data to be sent manually by clients, but can directly access information stored in the client's cloud system as long as they are authorized to access. This not only saves time but also allows auditors to respond more quickly to critical audit findings.

However, literature findings also reveal that the adoption of cloud technology in auditing is not free from significant challenges, especially related to data security and regulatory compliance. A study by (Alqudah et al., 2024) highlighted that auditors still have concerns about the protection of confidential information when audit data is stored and processed on third-

party servers. The risk of data leakage, cyber attacks, and unclear legal jurisdiction in cross-border data storage are issues that are repeatedly discussed in the literature. These concerns affect auditors' perceptions of the reliability of cloud technology, although in terms of operation this technology has been proven to speed up and simplify many audit processes.

The literature also discusses how cloud technology is changing the role of auditors in the digital audit ecosystem. Research by Vasarhelyi and Kuenkaikaew (2020) emphasizes that cloud-based auditing allows for the implementation of continuous auditing, which is an audit process that is carried out in real time through an automated monitoring system. In this system, data collected via the cloud can be directly analyzed by algorithm-based audit software, so that auditors no longer have to wait until the end of the period to conduct an audit. The implications of this approach are enormous, as it allows for early detection of anomalies, increased transparency, and strengthened overall corporate governance. However, this approach also requires auditors to master information technology and data analysis in greater depth than before.

In addition to the technical and professional aspects, the literature also raises the psychological and social dimensions of cloud-based auditing. A study by Zhou and Lee (2022) showed that perceptions of the convenience and ease of use of cloud systems greatly influence auditors' decisions to adopt the technology. Auditors who feel that cloud systems are too complex, or are not supported by adequate training, tend to show resistance to their use. In this context, the role of management in providing training, setting operational standards, and ensuring technical support is very important in forming a positive perception of cloud-based auditing. Thus, the success of technology adoption depends not only on the sophistication of the system, but also on the readiness of human resources to use it. Interestingly, some literature notes a disparity in the adoption of cloud technology between large and small audit firms. Large firms, which have greater resources and stronger technological capacity, tend to be faster and more aggressive in adopting the cloud as part of their digital transformation strategy. Meanwhile, small and medium firms face challenges such as limited funds, limited expertise, and minimal infrastructure support, which makes them more cautious or even delay the adoption of cloud technology. This phenomenon reflects the existence of a digital divide in the audit profession that has the potential to affect the overall audit quality standards, especially when differences in

technology adoption have implications for differences in the effectiveness of supervision and depth of audit analysis.

Another finding from the literature is the importance of integrating cloud-based audit systems with the accounting information systems used by clients. Several studies note that the challenge of compatibility between systems is still a fairly common technical obstacle. If the auditor's cloud system cannot be optimally connected to the client's ERP system or accounting software, the process of collecting audit evidence becomes inefficient. To overcome this problem, many audit firms are developing cloud-based audit solutions that can be customized and have a high level of interoperability. This integration capability is one of the key indicators in assessing the success of cloud-based audit implementation in the field.

Finally, the literature also highlights the importance of a regulatory framework that supports cloud-based audit practices. Several studies emphasize the need for updating audit standards and information security regulations that specifically regulate the use of the cloud in the audit context. Currently, existing regulations are often still general and do not explicitly accommodate cloud-based audit practices. This can create legal uncertainty for auditors and clients, as well as slow down the process of digital transformation in the audit profession. Therefore, collaboration between professional associations, regulators, and technology providers is crucial to creating a secure, reliable, and widely recognized cloud-based audit ecosystem.

Auditor Perceptions of Digital Audit

Auditor perceptions of digital audits are an important aspect of the audit transformation process in the modern era. Digital audits, which include the use of information technologies such as big data, cloud computing, artificial intelligence, and automation systems in audit implementation, have changed the way auditors interact with data, client systems, and how they evaluate and present audit results. Along with these changes, auditor perceptions reflect mental, professional, and technical readiness to accept and adapt to ever-evolving innovations (Innovative Information Technology in Auditing: Auditors' Perceptions of Future Importance and Current Auditor Expertise: Accounting in Europe: Vol 19, No 2, n.d.). In various empirical and theoretical studies, auditor perceptions of digital audits are often associated with factors of technological comfort, perceptions of efficiency, and trust in the accuracy of digital systems. Auditors who feel comfortable using digital technology,

especially those who have previous experience working with modern information systems or audit software, tend to show positive attitudes towards digital audits (Leocádio et al., 2024). They believe that the use of technology in audits can increase the speed of work, expand the scope of analysis, and enable auditors to capture patterns and risks that were previously difficult to detect with conventional audit techniques. Tools such as data analytics, for example, are considered capable of replacing sample testing procedures with comprehensive population testing, thereby strengthening the quality of audit findings.

However, not all auditors view digital audits positively. There is also a skeptical perception that stems from doubts about the reliability of technology, concerns about data security, and uncertainty about the role of humans in an increasingly digitalized audit system. Auditors who have had negative experiences using technology, or who are less exposed to the digital environment, tend to question whether technology can really replace professional intuition gained from experience. They are also concerned that the use of automated systems will reduce the role of auditors' professional judgment, even though such judgment is an essential aspect in assessing the client's condition as a whole. In addition, for some auditors, digital audits are considered a threat to job stability, because of the assumption that automated systems can take over most of the tasks of human auditors.

Age and educational background factors also influence auditors' perceptions of digital audits. Younger auditors and those who come from educational backgrounds with an emphasis on information technology and analytics tend to be more adaptive to digital audits. They see digital auditing not just as a tool, but as an integral part of the future of the audit profession. On the other hand, auditors who have been in the audit industry for a long time, and are accustomed to manual approaches and physical documentation, may feel that digital auditing requires additional effort in the form of training, adjustments to work methods, and investment of time to learn new systems. These differences in perception often create gaps within the audit team, which can ultimately affect the coordination and effectiveness of the audit as a whole.

In the organizational context, auditors' perceptions of digital auditing are also influenced by the extent to which they are supported by the management of the public accounting firm or audit institution where they work. A progressive work environment, which provides training, technical guidance, and opportunities to experiment with digital tools, will shape

positive perceptions of digital auditing. Auditors in this environment feel valued and supported to develop with the changing times. Conversely, organizations that are slow to respond to technological changes or are reluctant to invest in digital systems will create a stagnant environment, where auditors feel unprepared and unconfident in facing the demands of digital auditing.

The literature also shows that auditors' perceptions of digital auditing are closely related to their perceptions of risk and professional responsibility. Although digital audits can improve efficiency and effectiveness, some auditors feel that these systems increase stakeholder expectations for faster, more accurate, and more comprehensive audit results. This can lead to additional pressure for auditors, especially if the systems used are not fully mature or if the auditor does not have full control over the results of the digital system analysis. Therefore, auditors' perceptions of digital audits are not only formed from technical assessments, but also from the social and psychological context of the audit profession as a whole.

CONCLUSION

Auditors generally acknowledge that cloud technology offers a number of significant advantages. One of the main benefits often cited is the cloud's ability to store and process large amounts of data in real time, which makes it easier to gather audit evidence and shortens the audit time. In addition, auditors also see an increase in audit team collaboration and coordination because data can be accessed anytime and from anywhere. The ability to conduct remote audits effectively, especially during the pandemic, also reinforces the positive perception of cloud use.

In addition, cloud technology adoption requires new skills that not all auditors necessarily possess. Not all accounting professionals have an adequate information technology background to understand in detail how cloud systems work and their implications for internal control. This raises concerns about auditors' competence in assessing technology risks and performing effective audit procedures in a digital environment. Some auditors even feel the need for retraining or additional certification in order to optimally pursue cloud-based audit demands.

Another constraint that influences auditors' perceptions is the dependence on third parties, namely cloud service providers. In situations where the technology infrastructure is outside the direct control of both the client and the auditor, there are challenges in obtaining sufficient and reliable

audit evidence. Auditors must rely on Service Organization Control (SOC) reports or perform additional procedures to gain confidence in the effectiveness of controls in the cloud provider environment. This situation can prolong the audit process or even create uncertainty in risk assessment.

Amidst these dynamics, the role of regulatory agencies and professional associations becomes very important. Auditors need clear guidelines and standards regarding cloud-based audit practices, both in terms of evidence collection, documentation, and reporting. These standards will help minimize confusion and encourage consistency in the application of technology. In addition, support in the form of training, certification, and knowledge sharing platforms is also needed to improve technological literacy among auditors.

Overall, auditors' perceptions of cloud-based audits reflect a balance between enthusiasm for the potential of digital transformation and awareness of the risks that may arise. On the one hand, cloud technology brings great opportunities to improve audit efficiency and effectiveness, enable more optimal use of data, and provide flexibility in conducting audits. On the other hand, auditors are faced with the demands of understanding technological risks, maintaining data security, and building new competencies that are relevant to the digital era.

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