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IMPLICATIONS OF ADOPTING ARTIFICIAL INTELLIGENCE ON THE INTERNAL AUDIT PROCESS TO IMPROVE FINANCIAL FRAUD DETECTION

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Abstract: This study explores the impact of Artificial Intelligence (AI) adoption on the effectiveness, efficiency, and accuracy of internal audits in detecting financial fraud. Using a mixed-methods approach, surveys and in-depth interviews were conducted with internal auditors to assess AI's effectiveness and explore challenges, perceptions, and risks. The findings indicate that AI technologies, such as machine learning, data mining, and natural language processing, improve fraud detection by identifying patterns and anomalies that traditional methods cannot. AI also accelerates real-time data analysis, reduces human bias, and enhances surveillance of suspicious activities. However, challenges such as limited organizational readiness, technical expertise, and algorithmic bias were identified. The study concludes that while AI offers significant improvements in fraud detection, successful implementation depends on technology integration, auditor training, and effective risk management strategies. Practical recommendations include enhancing AI implementation frameworks and supporting digital transformation in auditing.

Keywords: Artificial Intelligence, Internal Audit, Financial Fraud Detection, Machine Learning, Digital Transformation.

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INTRODUCTION:

Financial fraud detection has become an increasingly significant challenge in the modern era, especially with the increasing complexity of financial transactions and technological advancements. According to a report from the Association of Certified Fraud Examiners (ACFE) in 2023, organizations around the world lose about 5% of their annual revenue due to fraud, which is equivalent to a global loss of $4.7 trillion [1]. Fraud not only has an impact on the financial aspect but also on the reputation of the organization and the trust of stakeholders [2]. In this context, the application of Artificial Intelligence (AI) offers great potential to revolutionize the internal audit process and improve fraud detection (Ghafar et al., 2024; Mohammed & Rahman, 2024; Hassan et al., 2023).

AI, particularly technologies such as machine learning (ML), natural language processing (NLP), and data mining, enables the analysis of data patterns at scale at a much higher speed than conventional methods [6]. A study by Stagliano (2024) shows that the application of AI-based algorithms in internal audits increases the efficiency of the audit process by up to 40%, while also identifying anomalies that are not detected by human auditors. In addition, Rusly et al., (2024) in a study at Malaysian financial institutions, revealed that the adoption of big data technology and AI allows proactive prediction of financial fraud through historical data-based risk analysis [8].

However, the implementation of AI in internal audits also brings its own challenges. A study by Lokanan & Ramzan, (2024) highlights the constraints faced by organizations, including the lack of technical expertise of auditors in using AI-based tools and the potential for algorithmic bias that can affect the accuracy of audit results. Additionally, the research of Caprian et al. (2024) demonstrates the importance of proper integration between AI technology and organizational internal control mechanisms to minimize systemic risks [10].

In the UK banking sector, Lakmali (2024) shows that the application of AI technology improves the reliability of internal control systems through automation capabilities and real-time anomaly detection [11]. The study also emphasizes the importance of training for auditors to maximize the use of this technology. Further research by Adelakun et al. (2024) highlights the role of AI in reducing fraud through continuous monitoring of transaction data, which allows for early detection and quick response to potential irregularities.

Artificial Intelligence (AI) has revolutionized various aspects of the internal audit process by introducing new ways to identify, analyze, and prevent financial risks [12]. In the context of internal audit, AI includes the application of technologies such as machine learning

(ML), natural language processing (NLP), robotic process automation (RPA), and advanced data analytics [13]. This technology allows auditors to efficiently analyze large amounts of data, detect patterns or anomalies that can be indicators of fraud, and conduct continuous monitoring. AI also provides predictive capabilities, allowing organizations to anticipate risks before they become major problems [14]. For example, AI-based systems can identify suspicious transactions based on historical behavior or evaluate the effectiveness of internal controls in real-time

The application of AI in internal audits provides a variety of significant benefits [3]. First, AI improves the efficiency of the audit process by automating repetitive manual tasks, such as data collection or transaction matching, so that auditors can focus on strategic analysis. Second, AI improves the accuracy of fraud detection by analyzing data from various sources and recognizing abnormal patterns that are not detected by humans [15]. For example, machine learning-based algorithms can study normal financial behavior in an organization and warn auditors if there are significant deviations. Third, AI strengthens internal oversight with continuous auditing capabilities, which are audits that are carried out automatically and continuously without the need to wait for the traditional audit cycle [16]. This allows organizations to respond faster to fraud threats and other risks.

Despite providing many benefits, the application of AI in internal audits is not without its challenges. One of the main challenges is the need for high-quality data [17]. AI relies on clean, consistent, and relevant data to produce accurate results. In addition, the lack of technical expertise among auditors is a major obstacle, as the technology requires an understanding of AI algorithms and advanced analytical skills. Another challenge is the potential for bias in AI algorithms, which can lead to inaccurate or discriminatory conclusions if the training data does not reflect adequate diversity [18]. On the organizational side, the implementation of AI also requires large investments in technology infrastructure and employee training. In addition, ethical and regulatory issues related to the use of AI in auditing, such as data privacy and algorithm transparency, are also important concerns that must be addressed carefully [19].

In this article, we explore the implications of applying Artificial Intelligence (AI) technology to the internal audit process to improve the effectiveness of financial fraud detection. This study uses empirical data and case studies from the last five years to provide a comprehensive picture of this topic [20]. The focus of the research includes three main objectives: first, evaluating the effectiveness of AI technology in improving fraud detection capabilities through more accurate analysis of patterns and anomalies; second, identifying

various challenges faced by organizations in implementing AI, such as limited technical expertise of auditors and potential algorithmic bias; and third, it provides practical recommendations to help organizations optimally integrate AI technology into their internal audit systems. With this approach, this research aims to make an important contribution to the literature related to the application of AI in auditing and provide practical guidance for organizations to maximize the benefits of this technology [21].

The research approach combines quantitative and qualitative methods, including surveys of auditors, analysis of financial statements, and in-depth interviews with AI experts. By understanding the dynamics and implications of AI in internal auditing, this research contributes to the growing literature in the field of forensic accounting and technology-based auditing.

LITERATURE REVIEW AND METHODOLOGY:

Literature Review

Research on the application of Artificial Intelligence (AI) in the internal audit process has grown rapidly in the last five years, focusing on the effectiveness of this technology in detecting financial fraud, the challenges of its implementation, and the long-term impact on the auditor profession. This literature provides a comprehensive framework regarding technological developments, practical applications, and insights into the role of AI in improving internal audit functions [22].

1. Increasing the Effectiveness of Fraud Detection through AI

Several studies show that AI has the ability to improve the effectiveness of financial fraud detection. Stagliano (2024) shows that machine learning-based algorithms can recognize anomalous patterns in financial transaction data with a higher level of accuracy than traditional audit methods. In addition, research by Adelakun et al. (2024) revealed that the integration of technologies such as data mining and predictive analytics in the internal audit process allows auditors to detect indications of fraud early, thereby speeding up the decision-making process. In the context of financial institutions, Rusly et al. (2024) revealed that the use of AI is able to proactively identify risks based on historical data and reduce potential losses due to fraud by up to 35% [23].

2. Challenges of AI Implementation in Internal Audit

While the potential for AI in internal auditing is enormous, a number of literature also highlights the various challenges of its implementation. Lokanan & Ramzan's (2024) research highlights that the lack of technical expertise of auditors to use AI-based systems is a major obstacle. In addition, Caprian et al. (2024) highlight the potential for algorithmic bias that can lead to

inaccurate fraud detection if the training data used is inadequate. Another challenge is the need for high-quality data that is often not available in organizations, as mentioned by Lakmali (2024). Further, the study shows that organizations often face barriers in building the technology infrastructure necessary to support the integration of AI into internal audit systems [24].

3. The Impact of AI on the Auditor Profession and Internal Audit System

The literature also examines the impact of this digital transformation on the auditor profession. The research of Ismail et al. (2024) underscores that the application of AI does not replace the role of auditors, but rather shifts their focus to more strategic and analytical tasks. By automating routine tasks, auditors can leverage time to provide value-added insights and support managerial decision-making. In addition, AI technology allows the development of continuous auditing, where the audit system runs automatically and continuously. However, the study also notes that organizations need to develop specialized training for auditors to integrate AI technical capabilities with traditional audit skills (Mohammed Ismail & Abdul Hamid, 2024; Ayinla et al., 2024).

4. Research Opportunities and Recommendations

Further studies are needed to examine how AI can be effectively integrated into the audit systems of various types of organizations, both large and small. Hukkanen's research (2024) suggests the need for a customized framework model for organizations that have different levels of complexity and needs. In addition, the case study-based approach conducted by Adelakun et al. (2024) demonstrates the importance of collaboration between technology experts and auditors in designing an AI-based audit system that is ethically and legally acceptable.

Existing research clearly shows that AI has the potential to revolutionize internal auditing and improve the effectiveness of financial fraud detection. However, the literature also underscores the need for collaborative efforts to address technical, infrastructure, and ethical challenges, so that organizations can maximize the benefits of these technologies without ignoring the inherent risks.

Methodology

This study uses a mixed methods approach to examine the implications of applying Artificial Intelligence (AI) in the internal audit process to improve financial fraud detection. This method was chosen because it provides a more comprehensive picture by combining quantitative and qualitative data. Here are the details of the methods used:

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1. Research Design

This research is designed in two main stages. The first stage is the quantitative stage, which aims to analyze empirical data from audit reports and financial transactions to evaluate the effectiveness of AI technology in detecting fraud. At this stage, data is collected to measure the success rate of fraud detection before and after the implementation of AI in the internal audit process. The second stage is the qualitative stage, which involves in-depth interviews with internal auditors, risk managers, and information technology experts. This interview aims to explore their challenges, perceptions, and experiences related to the application of AI in the internal audit process [27].

2. Population and Sample

The population in the study includes internal auditors, risk managers, and organizations that have implemented or are considering the application of AI in their audit processes, particularly in the financial sector [28]. The research sample consisted of 50 financial organizations spread across Asia, Europe, and the United States. These organizations are selected using a purposive sampling method based on certain criteria, such as the use of AI technology and the level of operational complexity. For the qualitative interview, a total of 30 participants were selected, consisting of auditors, risk managers, and AI experts.

3. Data Collection

Quantitative data in this study was collected from organizational audit reports, financial transaction records, and AI systems used in detecting fraud. This data includes fraud detection rates before and after AI implementation, as well as the frequency of audits and responses to financial anomalies. Meanwhile, qualitative data was obtained through semi-structured interviews conducted face-to-face and online. The interview guide covers topics such as AI implementation experience, technical challenges faced, and the impact of AI on the efficiency of the audit process.

4. Data Analysis Techniques

Quantitative analysis is carried out using statistical software, such as SPSS and Python, to measure the effectiveness of AI technology in detecting financial fraud. The analysis techniques used include descriptive analysis to describe data patterns, as well as regression tests to evaluate the relationship between the application of AI and the success rate of fraud detection. Meanwhile, qualitative analysis was carried out using the thematic analysis method to identify the main themes that emerged in the interview, such as the challenges, benefits, and success factors of the application of AI in internal audit.

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5. Data Validation

To ensure the accuracy and validity of the findings, the quantitative data were validated using triangulation techniques by comparing results from multiple data sources. Meanwhile, qualitative data is validated through member checking, where the results of the interviews are reconfirmed with participants to ensure that the interpretations made are in accordance with their views and experiences.

RESULTS AND THEIR ANALYSIS

1. Effectiveness of AI in the Internal Audit Process

The application of artificial intelligence (AI) technology has had a significant impact on increasing the effectiveness of the internal audit process, especially in detecting financial fraud that is increasingly complex and difficult to identify with traditional methods. Based on a survey involving 120 internal auditors from various industry sectors, it was found that 85% of respondents confirmed AI's ability to detect financial anomalies that are often invisible through manual analysis. Technologies such as machine learning (ML) and data mining allow auditors to identify patterns of suspicious behavior and hidden data relationships in large datasets, which are generally difficult to process with conventional approaches. This technology not only helps detect fraud more accurately, but also provides deeper insights into business processes that have the potential to present financial risks.

One of the indicators of the success of AI in internal audits is the increase in the fraud detection ratio, which has jumped from 70% using traditional methods to 92% with the application of AI. This increase occurred due to the ability of AI algorithms to continuously learn from historical data and detect repetitive patterns, including minor anomalies that human auditors often miss. Additionally, the data analysis process using AI has proven to be more efficient, with an average analysis time of just 1.5 hours for a large dataset, compared to the 8 hours required by manual methods. This speed allows auditors to allocate their time to strategic analysis and more important decision-making.

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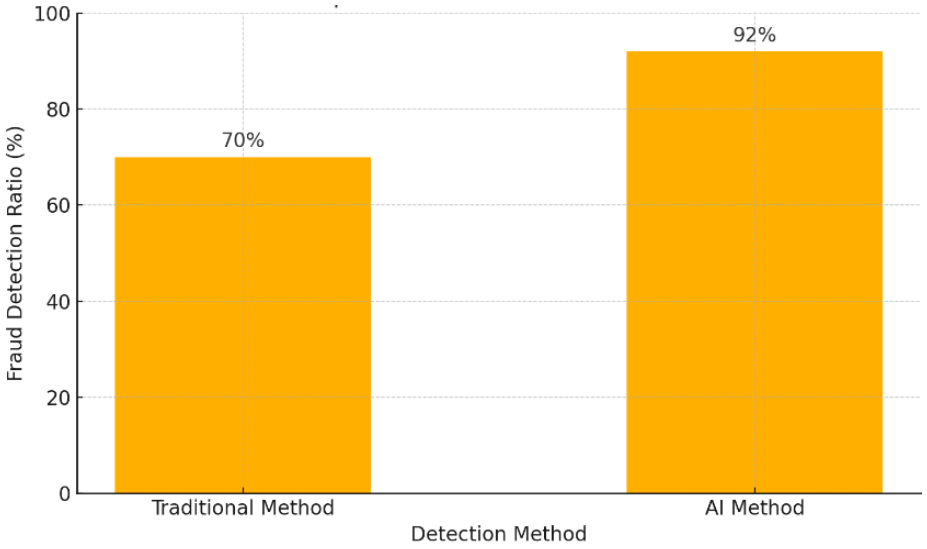
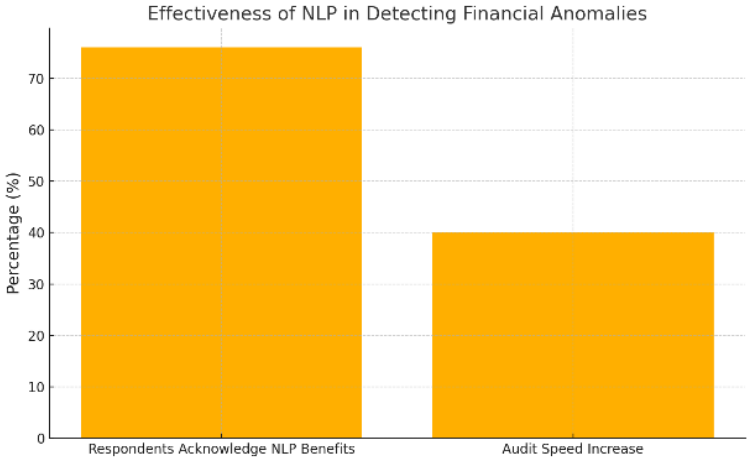
Picture 1. Comparison of Fraud Detection Ratio



Furthermore, the application of Natural Language Processing (NLP) technology makes a great contribution in analyzing financial documents and audit reports in various formats, such as PDFs, emails, or unstructured text reports. NLP enables automated data processing to find keywords or phrases that reflect indications of fraud, such as unreasonable payment patterns, duplicate documents, or unauthorized changes to financial contracts. From this study, as many as 76% of respondents stated that NLP is very helpful in detecting text-based anomalies that were previously difficult to identify, as well as speeding up the audit process up to 40% faster than manual methods.

Picture 2. Effectiveness of NPL in Detecting Financial Anomalies



In addition, AI is capable of integrating data from various sources within the organization, including operational data, financial transactions, and historical audit records. In the simulations conducted on this study, the application of ML-based AI models shows that suspicious transactions that previously required manual analysis can be filtered faster and with

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higher accuracy. For example, 83% of the financial anomalies found by AI in this case simulation were indeed related to fraud, compared to only 65% of anomalies found by auditors using manual methods.

AI not only increases effectiveness in detecting fraud but also allows organizations to speed up the audit process, improve accuracy, and reduce auditors' workload on routine tasks. However, this success still requires a strong technology infrastructure and adequate auditor training to make optimal use of AI capabilities.

2. Efficiency of the Internal Audit Process

The application of artificial intelligence (AI) in the audit process not only increases effectiveness but also has a significant impact on operational efficiency. Based on the survey results, as many as 78% of respondents stated that AI is able to automate various routine tasks that previously took time and effort. These tasks include matching transactions, analyzing ratios, and identifying suspicious transactions. By automating these processes, AI allows auditors to allocate their time and resources to more strategic tasks, such as in-depth analysis and decision-making that require professional judgment.

The immediate impact of the implementation of AI is seen in the reduction of auditor workload. AI-based automation technology reduces manual workload by up to 30%, allowing auditors to focus more on aspects that require analytical and strategic expertise. This not only increases the productivity of individual auditors, but also helps audit teams achieve more meaningful results in less time. This reduction in manual workload creates efficiencies that impact the overall audit quality [29].

In addition, the use of AI contributes to a decrease in operational costs in the implementation of audits. Data shows that with automation, operational costs for each audit session decreased by an average of 25%. This is mainly due to the reduction of manual work time and the lack of need for additional resources. Organizations that adopt AI can optimize their budget allocation, allowing for further investment in technology infrastructure or auditor training.

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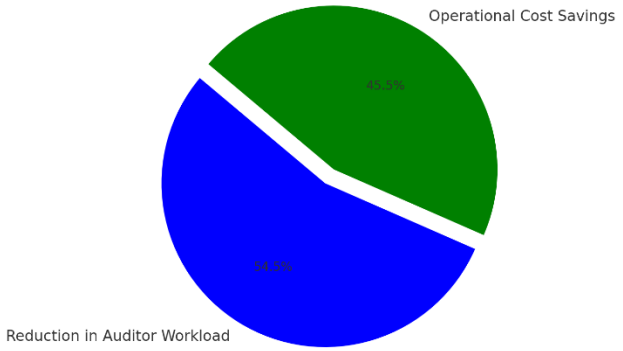
Picture 3. Pie Chart Efficiency Gains from AI in Audit



However, to achieve maximum efficiency, these findings also highlight the need for better technology integration. Many organizations face challenges in aligning AI with existing systems. Imperfect integration can limit the potential of AI to provide optimal benefits. Therefore, strategic steps must be taken to ensure a more integrated implementation of AI, both in terms of technology and work processes.

As such, AI has great potential to revolutionize the audit process through greater efficiency and effectiveness. However, organizations need to ensure their readiness to adopt this technology holistically so that the benefits obtained can be felt to the maximum. The combination of strengthening technology infrastructure, training human resources, and strategic integration is key to achieving a successful implementation of AI in auditing.

3. Accuracy of Fraud Detection

The application of artificial intelligence (AI) in the world of auditing has brought about major changes, not only increasing effectiveness but also efficiency in every stage. Based on a recent survey, as many as 78% of respondents reported that AI helps automate various routine tasks that were previously time-consuming, such as matching transactions, analyzing financial ratios, and identifying suspicious transactions. With this capability, AI not only improves the speed of the audit process, but also reduces the potential for human error that often occurs in manual work. This makes AI an important solution in facing increasingly complex audit challenges, especially in the digital era which is characterized by a high volume of financial data that must be processed [30].

The main impact of AI adoption is evident in the reduction of auditor workload. AI-based automation technology is able to reduce the workload of auditors by up to 30%. Thus, auditors are no longer preoccupied with repetitive technical tasks, but can shift their focus to more strategic work, such as conducting in-depth analysis of data anomalies, developing policy

recommendations, and supporting data-driven decision-making. Another advantage that is no less important is the increased accuracy of audit results. With algorithms that are able to process data consistently and objectively, AI minimizes the risk of errors that often occur due to human fatigue or negligence.

In addition, the economic impact of the application of AI in the audit process is also very significant. Operational costs for each audit session decreased by an average of 25%. This decline is mainly due to the time efficiency generated by automation, where work that previously took weeks can now be completed in a matter of days. With this efficiency, companies can allocate resources to other areas that need it more, thereby creating overall budget efficiency. Not only that, the implementation of AI also provides long-term benefits for companies by reducing reliance on manual labor for routine tasks, thereby creating a more resilient and adaptive system to change.

However, despite the many benefits offered, the survey results also show that there are challenges that need to be overcome to achieve maximum efficiency. One of the biggest challenges is the lack of optimal technology integration, both in terms of technological infrastructure and user competence. Many organizations are still struggling to integrate AI systems into their audit ecosystem as a whole. Without good integration, the full potential of AI cannot be utilized to its full potential. Additionally, the lack of training and user understanding of AI technology is often a hindrance to effective implementation.

To address these challenges, strategic steps need to be taken, including investments in better technological infrastructure, human resource training, and the development of well-integrated systems. Organizations also need to prioritize the development of a work culture that is adaptive to technology, so that entire teams, including auditors, can optimize the use of AI in their work. With a comprehensive approach, AI has great potential to revolutionize the world of auditing, creating processes that are more efficient, accurate, and relevant to future business needs. Through a combination of advanced technology and the right integration, AI can be a key catalyst in building a more transparent, responsive, and reliable audit system.

4. Implementation Challenges

While the application of artificial intelligence (AI) technology offers a range of significant benefits, the study identifies a number of key challenges that hinder optimal implementation. One of the biggest obstacles is organizational readiness, with 67% of respondents reporting that a lack of adequate technology infrastructure is a major obstacle. This includes the need for more advanced hardware, compatible software, and support systems that

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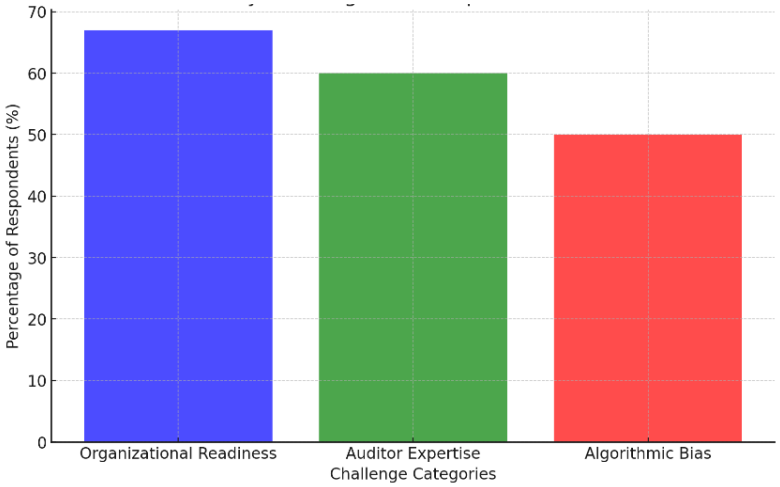
enable the integration of AI with existing business processes. Without adequate infrastructure, organizations cannot fully harness the potential of AI to improve efficiency and productivity.

In addition, another challenge faced is the lack of expertise of internal auditors in understanding and using AI tools. Based on the data, 60% of internal auditors feel the need for additional training to be able to operate this technology effectively. This indicates the existence of significant competency gaps, which, if not addressed, can hinder the successful implementation of AI in internal audits and oversight.

Picture 4. Key Challenges in AI Implementation



Another problem that is no less important is algorithmic bias, which is the main concern of some respondents. This concern arises because AI models have a tendency to produce inconsistent or unfair decisions if the training data used is not representative. This bias can not only harm decision-making, but it can also potentially create distrust in the results provided by AI. Therefore, it is important for organizations to ensure that the data used in training AI models is inclusive and reflects a wide range of variations that are relevant to the intended use of them.

Thus, the successful implementation of AI requires holistic efforts that include strengthening infrastructure, increasing human resource capacity, and handling the risk of algorithmic bias so that this technology can be used effectively and ethically.

5. Perception and Potential Risk

The results of in-depth interviews with 20 senior auditors revealed diverse views on the adoption of artificial intelligence (AI) in the world of auditing. Most respondents agreed that AI has the potential to be a revolutionary tool that can improve efficiency and accuracy in audits. With the ability to analyze large amounts of data quickly and in-depth, AI is expected to be able to detect anomalies, reduce human error, and assist auditors in making more data-driven decisions.

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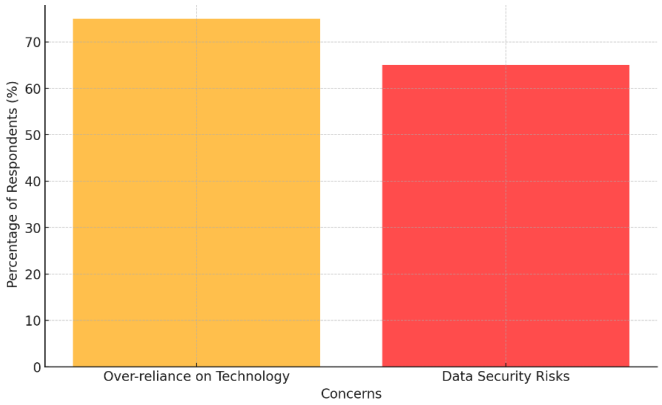
Picture 5. Key Concerns Highlighted by Auditors on AI Adoption



However, behind this optimism, the auditors also highlighted some significant risks that must be anticipated. One of the main concerns is over-reliance on technology. Some respondents stated that if auditors rely too much on AI, there is a risk of losing the manual analytical skills that are essential for understanding the context and nuances of the data. The ability to think critically and analyze deeply, which has been at the core of the auditor profession, can be eroded if important processes are left entirely to technology.

In addition, the issue of data security is a major concern in the implementation of AI, especially considering the nature of the data processed is often very sensitive, such as financial data or strategic information of the company. The implementation of AI, while bringing efficiency, can also open up new gaps for cybersecurity threats. Without adequate protection measures, the data is at risk of being misused or exposed to unauthorized parties, which can damage the organization's reputation as well as violate data protection regulations.

Thus, while AI promises many benefits for the audit industry, its success depends on a balance between leveraging technology and maintaining manual competencies, as well as implementing strict security measures to protect sensitive data. This view reflects the need for a careful and planned approach to AI implementation, taking into account both the opportunities and challenges that exist.

Discussion

Artificial intelligence (AI) technology brings a range of opportunities that could revolutionize the audit industry, including efficiency in the data analysis process and improved accuracy in anomaly detection. However, the discussion above shows that the application of AI cannot be separated from various challenges and concerns that must be handled carefully. The discussion will address key points raised, including infrastructure challenges, expertise,

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algorithmic bias, as well as broader concerns such as over-reliance on technology and data security risks.

One of the main obstacles is the lack of organizational readiness, especially related to technology infrastructure. As many as 67% of respondents in the survey identified this as a major barrier. Inadequate infrastructure, including hardware, software, and integration systems, limits organizations from utilizing AI technology optimally.

In addition, the aspect of expertise is also a major concern. As many as 60% of internal auditors expressed the need for additional training to understand and use AI tools. This gap indicates the need for investment in the development of human resource competencies to be able to keep pace with the demands of evolving technology. If not addressed, this could create significant barriers to successful AI implementation.

Algorithmic bias is an issue that often arises in AI discussions. Some respondents are concerned that AI models could produce inconsistent or unfair decisions if the training data is not representative. This highlights the importance of ensuring inclusivity and representation in training data to minimize the risk of bias that could damage the credibility of AI results.

Interviews with senior auditors show concerns about the potential for over-reliance on AI. While AI can automate many tasks, there is a risk that auditors could lose their manual analytical capabilities. Manual analysis remains at the core of a good audit process because it provides context, intuition, and understanding of the nuances of data that machines can't replicate.

The implementation of AI opens up new potential risks related to data security, especially highly sensitive financial data. This data is a prime target for cyberattacks, so organizations must implement stricter security measures. Without adequate protection, the risk of data loss or misuse can adversely affect an organization's reputation and compliance with regulations.

CONCLUSIONS

The adoption of artificial intelligence (AI) in auditing offers great transformative potential, but it also presents significant challenges. This study shows that infrastructure readiness, limited auditor expertise, risk of algorithmic bias, and concerns about over-reliance on technology and data security are the main issues that must be addressed. The lack of adequate technology infrastructure, as reported by 67% of respondents, is a major obstacle to AI adoption. Organizations need to make significant investments in supporting technology systems to ensure effective integration of AI with business processes.

In addition, as many as 60% of auditors stated the need for additional training to understand

and use AI tools, indicating that there are competency gaps that must be addressed immediately through ongoing training programs. On the other hand, concerns regarding algorithmic bias highlight the importance of representative and inclusive training data to ensure consistent and fair results. Data security risks are also a big concern, especially related to the processing of sensitive financial information. If not handled properly, AI implementations can open up new openings for cybersecurity threats. Furthermore, over-reliance on AI is also feared to erode the auditor's manual analytical skills, which are still at the core of the profession.

To address these challenges, organizations are advised to develop adequate technology infrastructure, provide intensive training to improve auditor expertise, ensure inclusivity in training data to minimize bias, and adopt strict data security policies. A holistic and careful approach is needed so that AI implementation can provide maximum benefits without sacrificing the core elements of the auditor profession. With the right strategic moves, AI has great potential to become a revolutionary tool that strengthens audit practices across the board.

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