ICAEA INTERNATIONAL

# The Application of AI in Auditing



97% of the global participants have recognized the value and advantages of AI for audit work. However, there are still more to know. 9 key findings are provided by ICAEA, aim to gain insigh of future auditing.

White Book

# Acknowledgments

We would like to extend our heartfelt gratitude to the Japan, Korea, Taiwan, Middle East chapters, and others for their invaluable assistance in the publication of the "ICAEA2023: Survey on the Application of AI in Auditing."

Your enthusiastic participation and contributions were instrumental in the successful completion of this significant endeavor. Without your expertise and insightful input, we would not have been able to accomplish the publication of this White Paper. We truly appreciate your selfless dedication, which allowed us to explore together the application of AI in auditing and contribute further value to the global auditing and corporate governance landscape.



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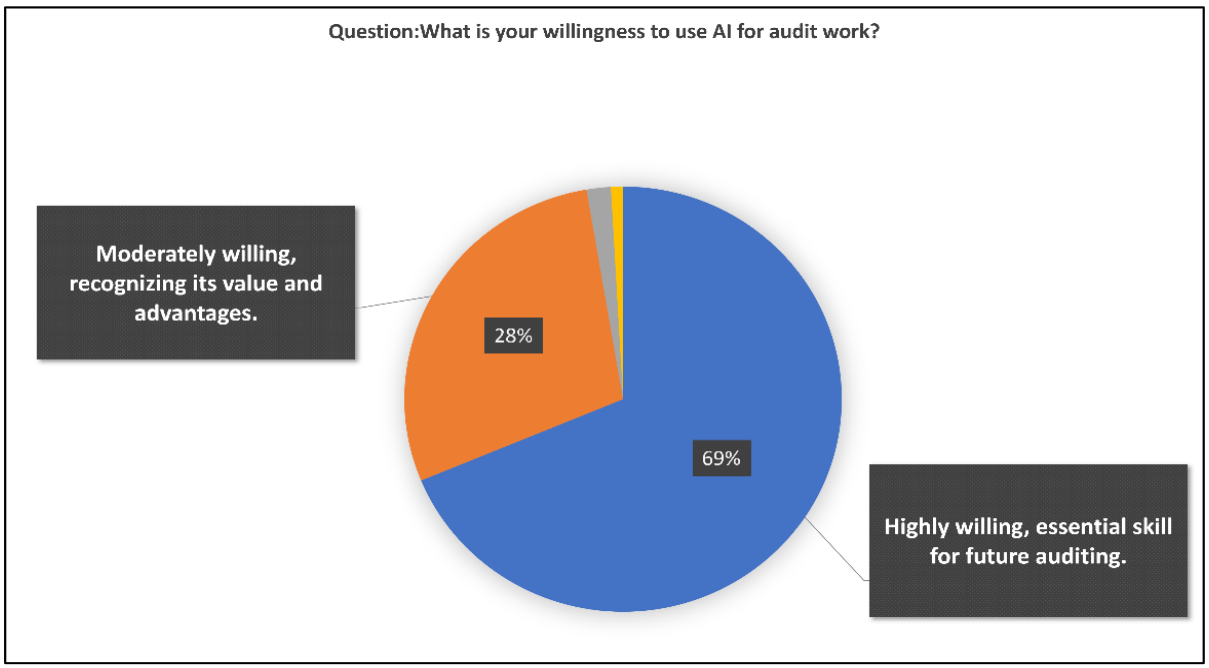
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# Executive Summary

Audit is advancing to the next stage. The revisions made to the American Institute of Certified Public Accountants (AICPA) CPA Exam in 2021 and 2024 underscore the growing significance of emerging technologies within the accounting profession, with a heightened emphasis on data and technology concepts. Indeed, the landscape of what auditors can achieve with information technology has undergone a significant transformation. Present-day auditors possess the capability to conduct both descriptive and predictive analyses, process both numerical and textual data, and apply these capabilities across various facets of their work, from assertion testing to compliance and risk assessments. [1][2]

According to our recent survey, 69% of global participants exhibit a positive and proactive attitude towards utilizing AI for audit purposes. Remarkably, 97% of respondents globally have recognized the value and advantages of AI in this context.




Nevertheless, several challenges persist in integrating AI technology into audit processes, such as concerns regarding data quality and integrity. Furthermore, there is apprehension that auditees might employ AI-generated deceptive techniques for fraudulent activities.

To gain insights into the current landscape, motivations, challenges, and perspectives surrounding AI adoption, the International Consortium for Advanced Audit and Evaluation (ICAEA) conducted a benchmarking survey titled “ICAEA2023: Survey on the Application of AI in Auditing” in 2023. This survey comprised 15 questions, and responses were provided anonymously.

The purpose of this survey was to gather people's opinions on the Application of AI in Auditing. Respondents provided their role within the organization and the industry which their organizations belonged to, providing context and perspective to their answers.

The information collected from the returned surveys has led to this publication, which we hope internal auditors will find interesting. The date of the last response was January 25, 2024.

## Key Findings:

1. **Statistical data analysis is the most considered technology for audit work.**
   Nearly 60% of respondents have once utilized statistical data analysis for audit tasks, indicating its widespread popularity and efficacy.

2. **Discrepancy between AI expectations and investment.**
   Despite 69% of participants acknowledging AI as an essential skill for future auditing, over 50% of those currently using or planning to use AI for audit work allocate budgets below $10,000 annually, showcasing a gap between expectations and investment realities.

3. **Strategic utilization of AI in daily audit tasks.**
   A significant majority (87%) of participants reported utilizing four or fewer types of AI technology for their daily auditing tasks, indicating a selective yet targeted integration of AI into audit workflows.

4. **The primary motivations for CEOs to support is to enhanced efficiency and effectiveness**
   A staggering 90% of respondents cited the improvement of audit efficiency and effectiveness as the primary motivation for CEOs to support the utilization of AI technology in audit work.

5. **Data, technology, and talent are the main challenges in using AI technology.**
   Over half of the participants identified data, technology, and talent as the primary challenges encountered when integrating AI into audit work processes.

6. **Preference for general audit software with AI features.**
   A significant majority (78%) of participants consider general audit software with AI features as the most suitable for leveraging AI technology in audit tasks.

7. **Diverse applications of AI in auditing.**
   Responses regarding priority applications of AI in auditing were varied, with no single application exceeding 30% of total responses, underscoring the diverse and multifaceted nature of AI's role in the audit domain.

8. **Double-edge of generative AI**

   While 66% of participants expressed concerns about generative AI, a majority within that group (54%) maintain the belief that its positive impact will outweigh the negative implications.

9. **Anticipated significance of AI in future audit work.**

   A vast majority (94%) of respondents foresee AI significantly impacting audit work within the next five years.




# 1 | Survey Concept

Title: ICAEA2023: Survey on the Application of AI in Auditing

Description: The International Computer Auditing Education Association (ICAEA) conducted a comprehensive survey titled "ICAEA2023: Survey on the Application of AI in Auditing" to gauge the adoption and perception of AI technology for audit work. The main survey subjects came from six groups: the auditing industry (registered accountants), regulatory bodies (FSA, UK FRC), the business world (internal auditors), research institutions (universities/graduate schools), software developers, and finance and auditing professionals. All were interested in computer auditing, including education and data analysis.

The survey aimed to gather insights into participants' experiences, current practices, short-term investment plans, and opinions regarding AI technology in auditing.

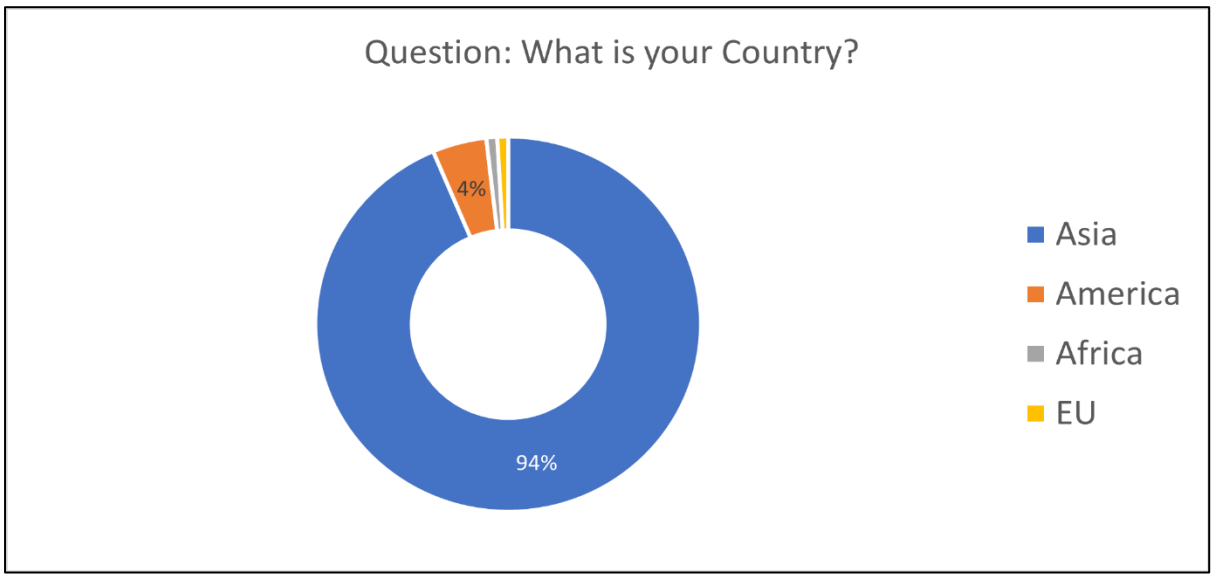
Through analysis of the survey data, readers can access a platform of open information and gain valuable insights into the current landscape, challenges, and future trajectories of computer auditing development.

Survey Link: https://reurl.cc/09bDlk

# 2| Overview of Participants

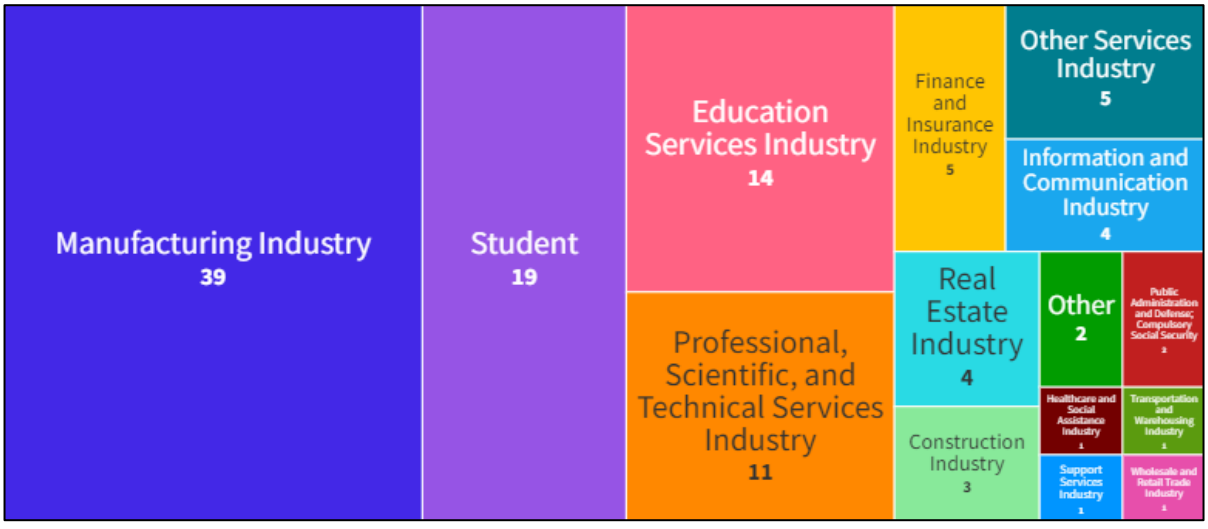
## From Country Aspect

With over 90% of participants from the Asian region, this indicates a high level of interest and a strong desire for more information among participants from that region regarding the future development of auditing in the face of the dual strong trends of digital transformation and ESG issues. It underscores a strong inclination to address a broader scope of work more efficiently.




## From Industry Aspect

Despite participants representing diverse industries, the manufacturing sector and students emerge as key players in this year's survey. The manufacturing industry, having dedicated significant resources to digital transformation efforts, demonstrates a keen interest in exploring AI applications across various domains. On the other hand, students exhibit a heightened curiosity about AI's role in auditing compared to most industries, signaling a recognition of the importance of acquiring future auditing skills .



### From Primary Function Aspect

The majority of our participants are primarily involved in auditing, particularly internal auditing. Additionally, we observe significant representation from functions directly related to finance and auditing, such as finance and accounting. Participants whose primary function lies in education and training offer an alternative perspective on AI auditing, enriching the survey with diverse and professional opinions from multiple domains.






# 3| Experience, Maturity Level, and Short-Term Investment Plan

**Findings:**

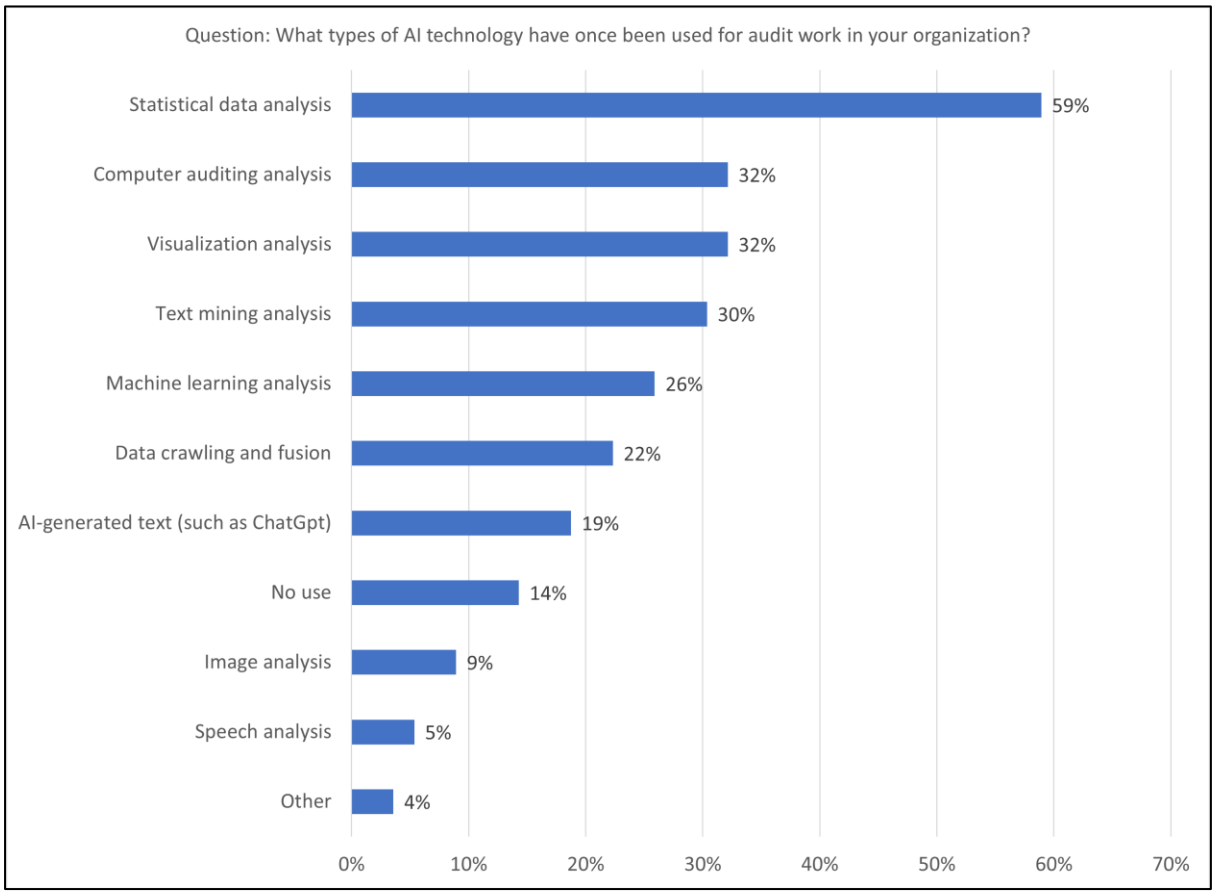
1. Statistical data analysis is the most considered technology for audit work.
2. Discrepancy between AI expectations and investment.
3. Daily auditing task may be completed by using four or below types of AI technology.

## Statistical data analysis is the most considered technology for audit work.

Statistical data analysis (59%), visualization analysis (32%), computer auditing analysis (32%), and text mining analysis (30%) emerge as the most considered analytical methods. This can be attributed to their high usability and universality. These analyses can be swiftly conducted using tools such as ACL and JCAATs.

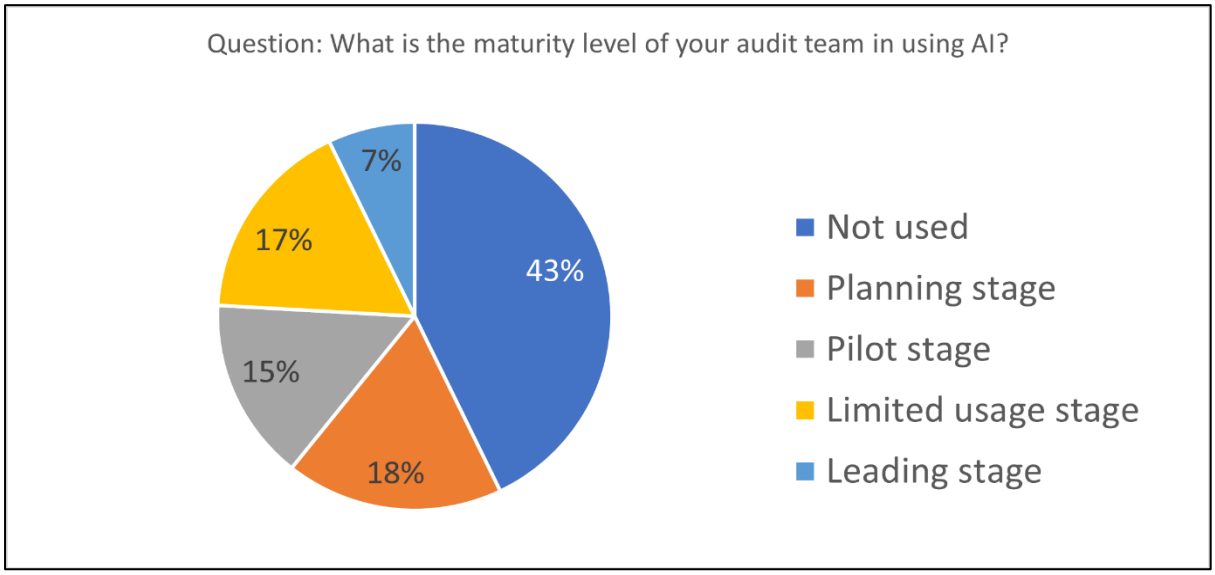
In contrast, machine learning analysis (26%) and data crawling (22%) stand out as the most sought-after AI technologies in today's landscape. It is anticipated that their adoption rates will continue to ascend in the forthcoming years.

Less utilized technologies such as image analysis (9%) and speech analysis (5%) require a higher level of AI proficiency, which explains their lower adoption rates compared to other methods.

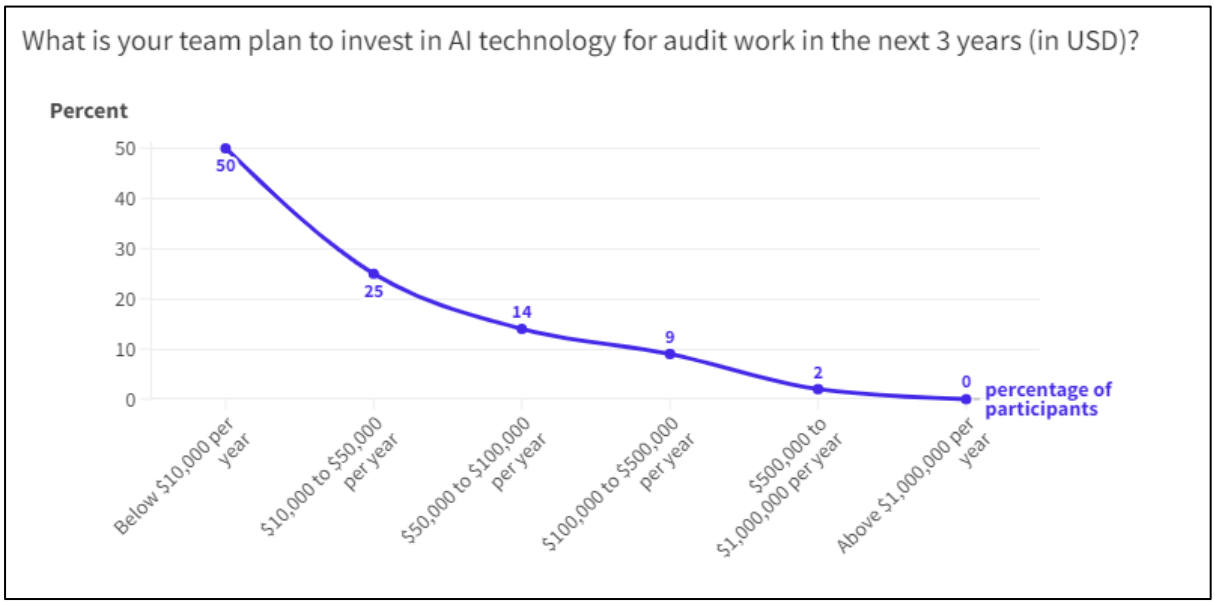


## Discrepancy between AI expectations and investment.

While 86% of participants have once utilized at least one AI technology for audit work, a notable 43% perceive their audit teams as being at the 'Not used' maturity level in using AI . Furthermore, most of participants (75%) in this group plan to invest below $10,000 annually in the next three years. This suggests that although some have ventured into embracing AI technology, they ultimately decided against its utilization.



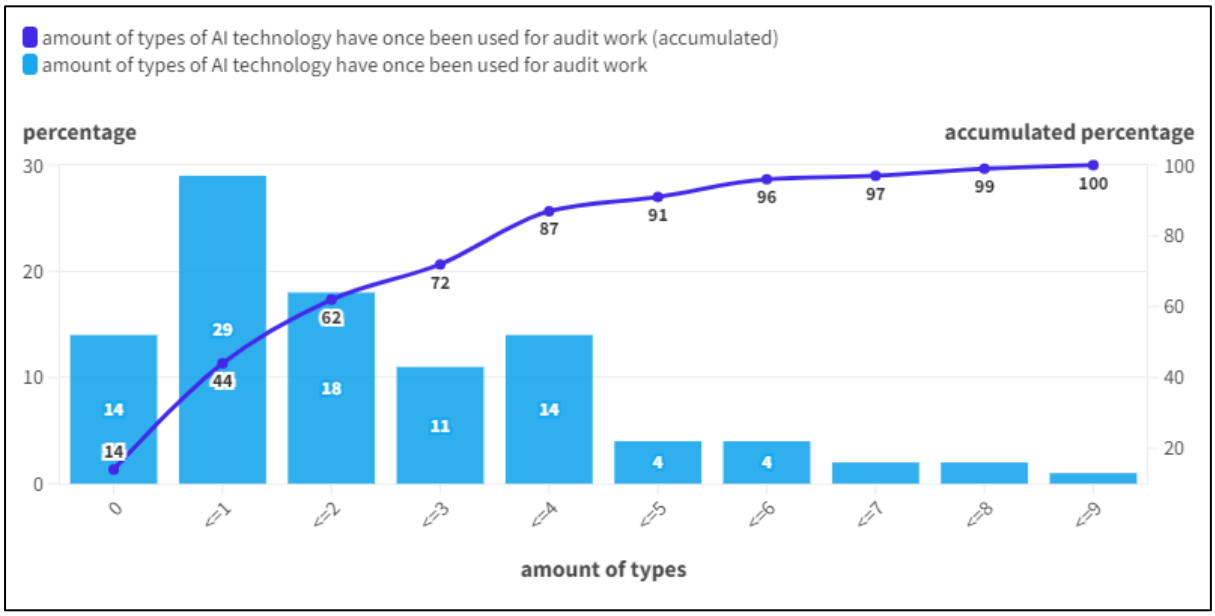

Among the remaining 57% of participants, half intend to invest below $10,000 annually in the short term, while a quarter have earmarked budgets ranging between $10,000 and $50,000. This indicates that despite the majority already understanding the value and benefits of AI, even considering it a necessary skill for the future, there still appears to exist a conservative perspection toward its immediate integration into audit processes at present. Besides, according to Red Hat 2023 Global Tech Outlook, IT Security is consistently the top IT technology funding priority. It potentially lead to allocating less money towards AI technology for audit work.[3]

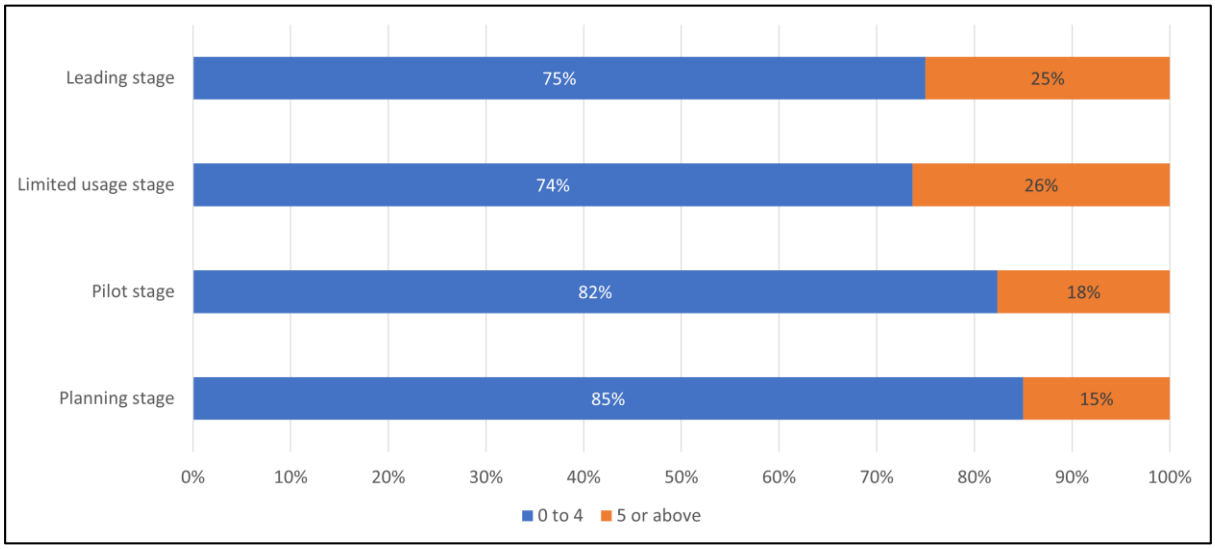


## Strategic utilization of AI in daily audit tasks.

When analyzing participants who do not utilize more than four types of AI technologies for audit work, we find that 87% of the range is encompassed. Furthermore, upon classifying participants based on maturity level from 'Planning stage' to 'Leading stage', there were no significant disparities among each group regarding the percentage of those using four or fewer types of AI technology, indicating that the majority of participants likely complete their daily auditing tasks using at most four types of AI technologies.

Although the 'Leading stage' and 'Limited usage stage' groups exhibit higher percentages of participants utilizing more than four types of AI technology, accounting for 25% and 26% of their respective groups, this trend is reasonable. Higher maturity levels in AI usage may naturally prompt organizations to explore additional tools. However, it is important to note that utilizing more than four types of AI technology does not necessarily imply redundancy. Rather, it underscores the need for careful evaluation before adopting new AI technology, ensuring alignment with organizational objectives and maximizing efficiency in audit processes.



# 4| Main Motivations and Challenges of Using AI Technology

**Findings:**

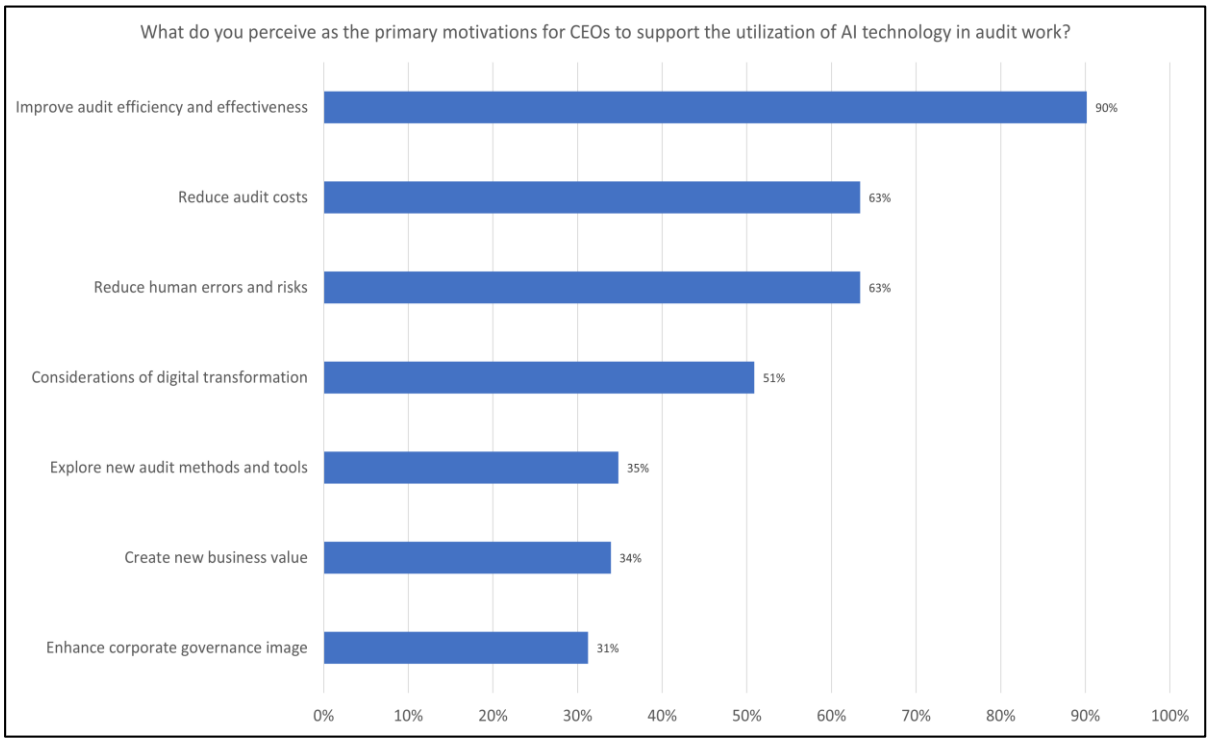
1. The primary motivations for CEOs to support is to enhanced efficiency and effectiveness.
2. Data, technology, and talent are the main challenges in using AI technology.

## The primary motivations for CEOs to support is to enhanced efficiency and effectiveness.

Our survey findings reveal a consensus among participants regarding the paramount importance of efficiency and effectiveness (90%) as the primary benefits of AI integration. Moreover, there is a strong emphasis on reducing audit costs (63%) and mitigating human errors and risks (63%), highlighting the significant value placed on these outcomes within the audit community.

Technology, such as robotic process automation (RPA), presents a valuable opportunity for auditors to streamline their workflows, alleviate audit burdens, and allocate resources more efficiently toward tasks demanding higher levels of judgment. The Big Four and regional accounting firms, have already embraced RPA and integrated automation into their audit processes. By leveraging RPA, auditors can enhance audit efficiency, mitigate errors, and empower audit professionals to concentrate on tasks that necessitate critical judgment and expertise. [4]

Furthermore, the survey underscores the recognition of the importance of digital transformation among CEOs. This suggests a broader acknowledgment within organizational leadership of the pivotal role that AI and technological advancements play in driving operational efficiency and achieving strategic objectives.



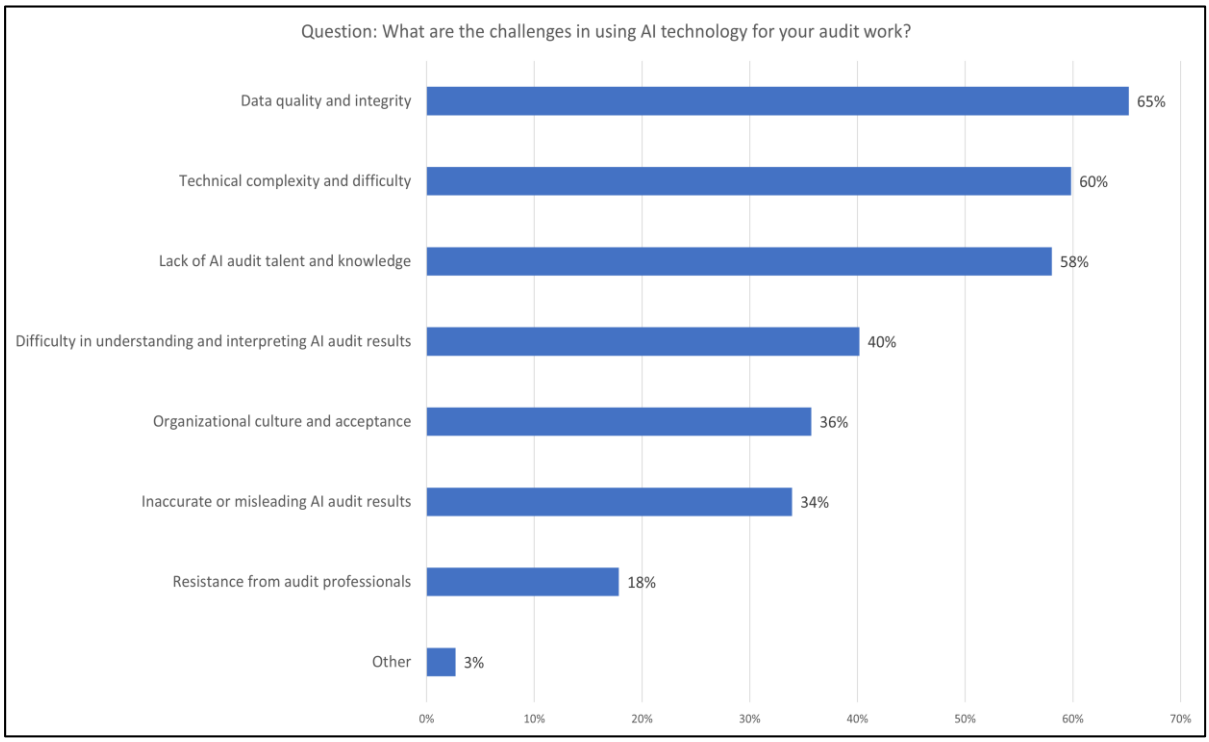
## Data, technology, and talent are the main challenges in using AI technology.

Participants in our survey have identified several significant challenges in the adoption of AI in auditing, with data quality and integrity (65%), technical complexity and difficulty (60%), and a shortage of AI audit talent and knowledge (58%) standing out as the most pressing issues. These challenges are not unique to auditing but are pervasive across various fields where AI is being applied.

According to Harvard Business Review, challenges related to data integrity and quality often stem from the challenges of data integrity and quality often stem from incorrect or outdated corporate governance structures There is no specific guardian for data integrity and only 3% of companies met basic data quality standards.[5]

Additionally, the rapid pace of technological advancement contributes to the complexity and difficulty associated with implementing AI solutions effectively. Addressing these challenges requires talents proficient in both auditing principles and AI technology, a combination that is currently scarce since mastering both disciplines demand a significant investment of time and resources.

Besides, concerns persist regarding the comprehensibility and accuracy of AI audit results, raising apprehensions about their reliability and interpretability. These concerns underscore the need for ongoing efforts to enhance the transparency and reliability of AI-driven auditing processes.






# 5| Opinions

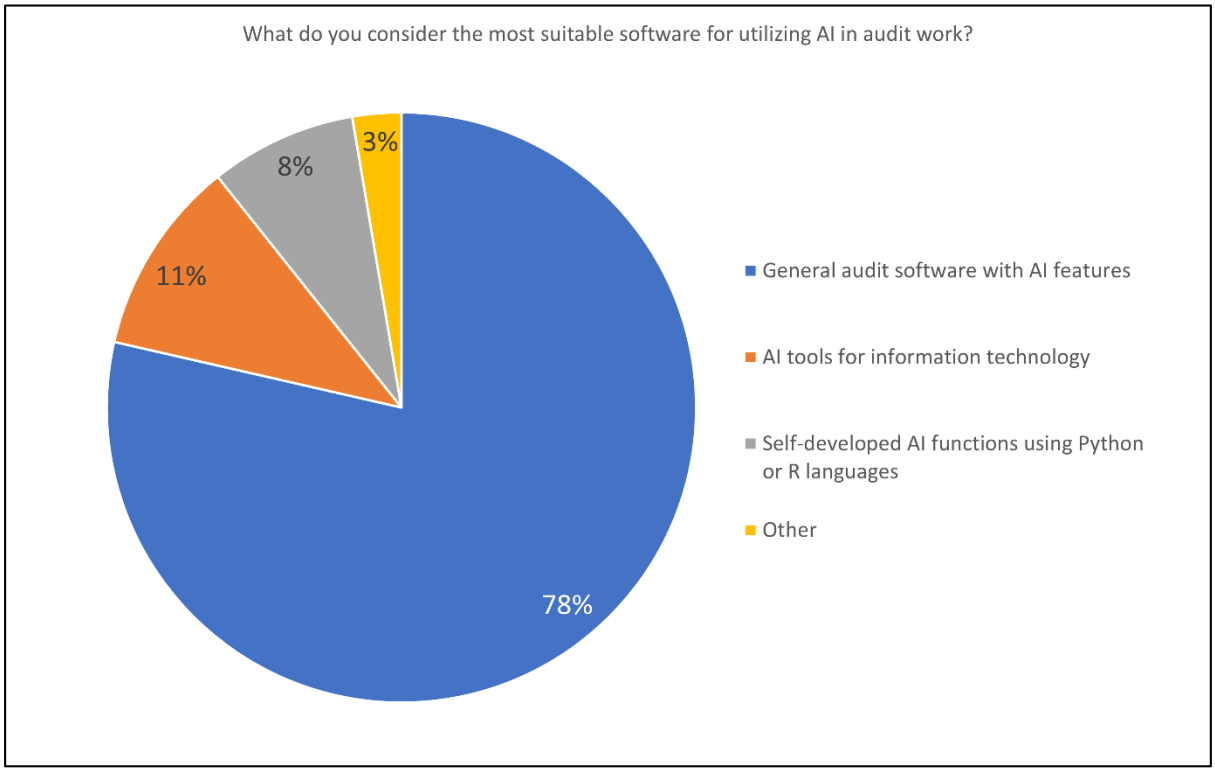
**Findings:**

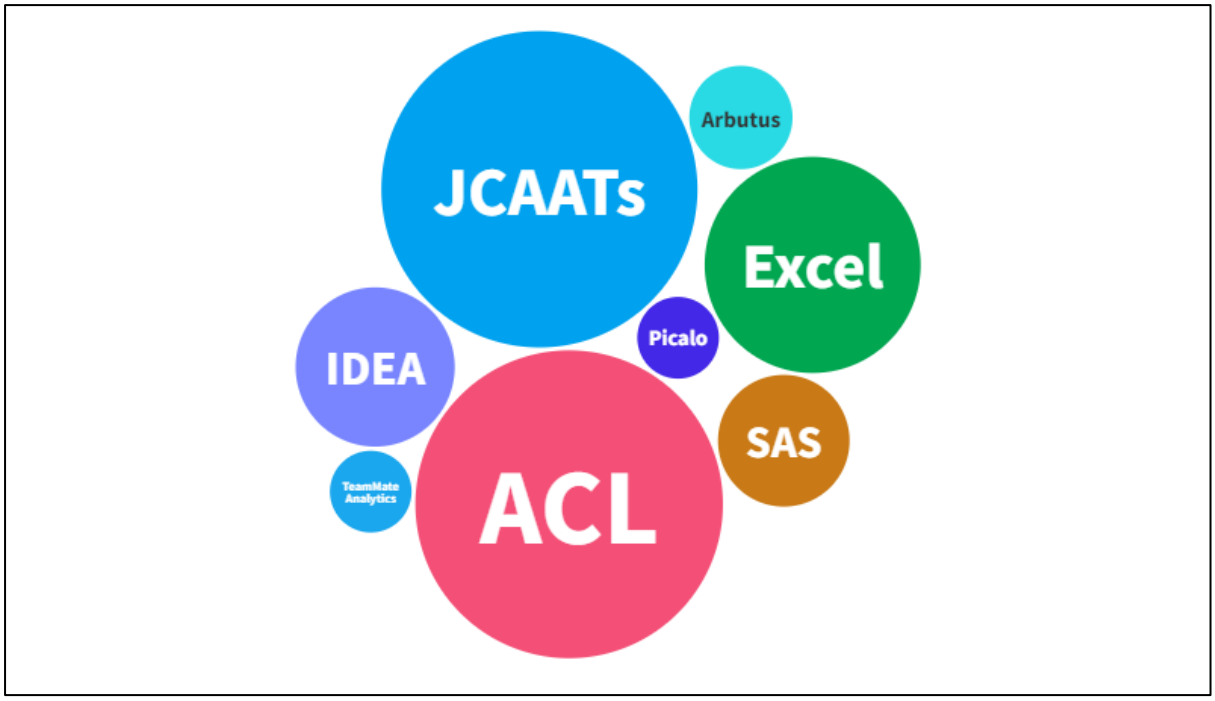
1. General audit software with AI features is considered the most suitable software for utilizing AI in audit work.
2. The application of AI in auditing is diverse and significant.
3. Despite concerns about generative AI, people are still willing to believe that its benefits outweigh its drawbacks.
4. It is anticipated that AI will significantly impact audit work within 5 years.

## Preference for general audit software with AI features.

Participants overwhelmingly favor the use of general audit software with AI features (78%), exemplified by platforms like ACL and JCAATs. This preference can be attributed to their comprehensive features and user-friendly design. Given their origin in the auditing domain, these software solutions are more likely to cater to the specific needs of auditors while requiring minimal AI skills from users.

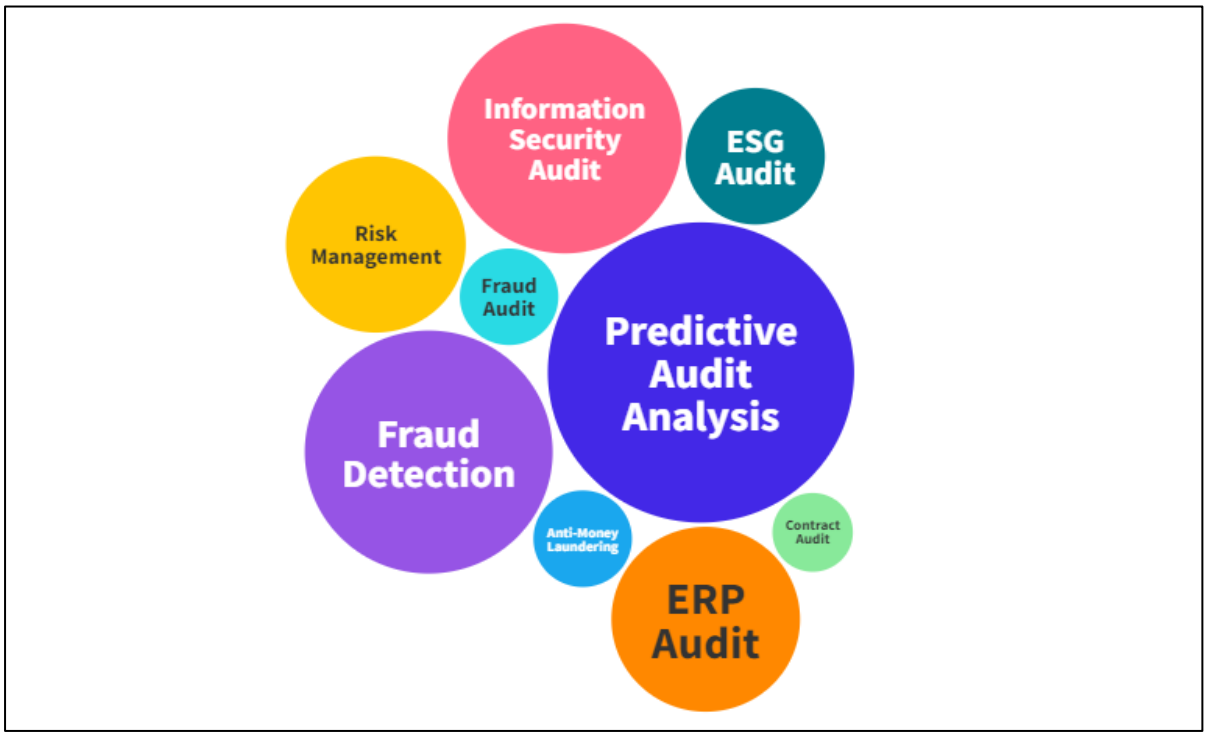
In contrast, utilizing 'AI tools for information technology' poses challenges related to technical complexity and difficulty. These tools may not be purpose-built for auditing requirements, complicating their integration and usage in audit processes. Similarly, leveraging 'Self-developed AI functions' presents additional hurdles, as developing and maintaining custom AI solutions demands specialized expertise and resources beyond the scope of traditional audit teams.





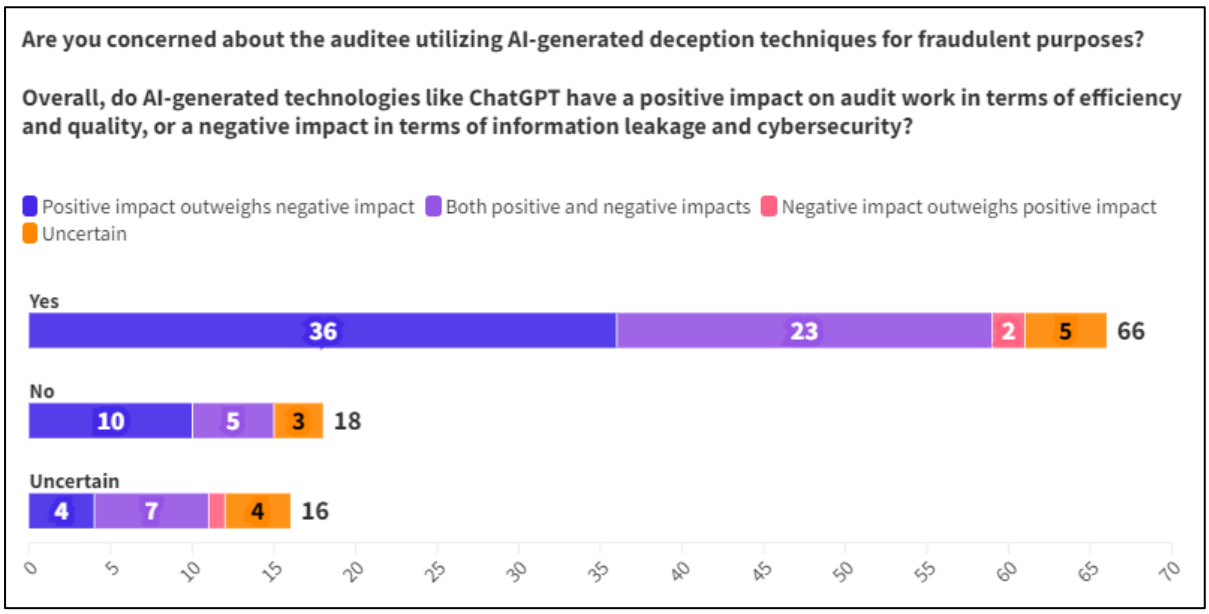

## The application of AI in auditing is diverse and significant

While the priority application of AI in auditing work may differ among participants, the breadth of AI applications in auditing highlights the significant benefits it offers to the field. This diversity emphasizes the importance of carefully assessing organizational priorities to maximize gains effectively. By understanding the wide-ranging potential of AI applications in auditing, organizations can capitalize on the most impactful opportunities, thus optimizing their outcomes and driving greater value.



**Despite concerns about generative AI, people are still willing to believe that its benefits outweigh its drawbacks.**

While 66% of our participants express concerns about the potential misuse of AI-generated deception technology for fraudulent purposes, 54% of this group maintain a belief in Generative AI's positive impact outweighing the negative. Additionally, only 3% of our participants hold a negative attitude towards Generative AI. These findings suggest that despite most of the participants are in the early stages of AI technology in the auditing domain, optimism and hope for its future possibilities persist among them.




**It is anticipated that AI will significantly impact audit work within 5 years.**

Nearly all participants (94%) anticipate significant impacts of AI on auditing within 5 years, with 77% believing this transformation might occur within 3 years. However, despite these expectations, the maturity level in using AI for audit among participants remains predominantly at an earlier stage. Alarmingly, 43% of participants do not utilize AI technology at all, and investments in AI auditing in the short term are relatively conservative.

These indications suggest that we may not be adequately prepared for the impending change that AI will bring to auditing. Consequently, the short-term impacts of AI on auditing may not be as optimistic as initially anticipated. However, from a long-term perspective, the benefits of AI on auditing still outweigh the drawbacks, emphasizing the importance of accelerating efforts to bridge the gap between expectations and readiness for AI integration in auditing practices.




## 6|Conclusion

Over the past decade, the International Computer Auditing Education Association (ICAEA) has been dedicated to promoting the cultivation of technology and critical thinking skills among auditors. We firmly believe that computer auditing is a practice that necessitates real-world application.

The introduction of AI has initiated a profound transformation in the auditing field, presenting a myriad of opportunities and challenges. While there is widespread optimism about the potential benefits of AI technology in enhancing efficiency, effectiveness, and reducing audit costs, concerns persist regarding challenges such as data quality, technical complexity, and the reliability of AI-generated results. Our survey results indicate that we are still in the early stages of incorporating AI technology into auditing practices, with most participants acknowledging its value and advantages. However, there remains a cautious approach to investing in AI technology for audit work, highlighting the importance of further evaluation and prioritization to align organizational goals with technology adoption strategies.

Despite prevailing uncertainties and challenges, there is a palpable sense that AI will significantly impact audit work in the near future. This underscores the need for proactive adaptation and strategic planning to harness the full potential of AI in shaping the future of auditing practices. Moving forward, ICAEA will continue to emphasize the integration of theoretical knowledge with hands-on case studies to ensure that possess practical technological skills alongside theoretical competency.



# 7| Methodology

ICAEA conducted a survey of 112 respondents from 16 countries to understand the opinions on applications of AI in Auditing. The respondents come from various industries and positions to demonstrate diverse and independent perspectives.

This survey used a closed-ended online questionnaire and a convenience non-random sampling method. The sample was taken from ICAEA members or relevant personnel, and the deadline for response was January 25, 2024. The survey aims to explore audit technology from fifteen questions and five perspectives to understand the respondents' views on 'the current status, challenges, and future of audit technology and skills.' Through the survey and analysis, readers can access public information to gain a deeper understanding of the current status, challenges, and future direction of computer audit development.

# 8| Notes

This survey is conducted online and most of the respondents are members and related personnel of ICAEA, with a total of 117 participants. The sampling method is non-random, so the representativeness of the sample needs to be taken into account.

In some of the charts, the total percentage may not add up to 100%, which includes rounding of percentages, multiple choices, and answer options that have not been displayed yet due to their relevance (such as "none").

# 9| Reference

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