



Transformation of Financial Auditing with Analytics, Automation, and AI

Kai-Yu Chen

Abstract

In the past, auditors have been using detailed and systematic approaches to ensure that financial statements are both true and fair. Nonetheless, technological progress (e.g., data analytics, and automation technologies like artificial intelligence) is changing the way audits are carried out. Such changes do not provide mere improvements on conventional approaches; they entirely revolutionize the auditing procedure itself with increased efficiency and exactness. This paper discusses how these technologies are being integrated into audits. We will look at specific tools or techniques that have benefited from this development. By considering past technology incorporation in auditing, we explore how these innovations improve existing practices while bringing new challenges. It also highlights some best practices of leading businesses and the future of the audit profession around it. The paper will focus on such key aspects as data security, whether AI can replace human auditors, and how modern auditors relate to an ever-increasingly digitized world.

Table of Contents

Introduction.....	4
Overview of the Analytics, Automation, and AI Used in Audit.....	4
Benefits of Analytics, Automation, and AI in Audit	7
Challenges and Risks	8
Industry Publications and Case Studies of Successful Implementation	9
What the Future Holds	10
Conclusion	11
References.....	12
About the Author	13

Introduction

Since 1845, financial auditing has been required by law to protect shareholders from improper actions by promoters and directors. Due to the nature of financial audits, the auditing approach relies on systematic procedures that require comprehensive documentation as the cornerstone. However, with the emergence of analytics, automation, and AI, auditing firms have found ways to utilize these tools and technology to assist auditing procedures in being of sounder quality. Firms have recognized that the traditional way of auditing was insufficient to satisfy the expectation of audit quality. This paper will introduce the procedures and technologies incorporated into financial audits that have revolutionized traditional audit procedures. With disruptive innovations come risks and obstacles, including resisting changes from the conventional approach and other data security concerns. The transformation is an ongoing revolution, with multiple big players in the financial audit field embracing it in its service offerings. What the future holds for the financial audit landscape is exciting as more technology is developed and incorporated.

Overview of the Analytics, Automation, and AI Used in Audit

Data Analytics

Financial auditing involves large amounts of client data sets. These data sets include general ledger data, accounts payable/accounts receivable data, sales and purchase data, inventory records, and journal entry data. Along with the current year's data, prior years of these data sets are also required in performing financial audits, which usually represent very large amounts of data.

The most conventional tool that auditors use is Microsoft Excel in handling these large data sets. However, Microsoft Excel is limited to data sorting, reconciliation, and data validation. The pivot table and data visualization function from Excel were commonly used in audits to capture trends and patterns and extract insights. However, due to the functional limit of Microsoft Excel,

the data preparation and analysis often takes multiple layers of dividing and joining of data, which is time-consuming and repetitive.

Over the past few decades, firms started to turn to more advanced data tools for handling large sets of data. Power BI is a commonly used tool for handling large sets of data for data visualization.

Spotlight, an in-house data platform developed by Deloitte, enables visual analysis of financial statements and journal entries, highlighting high-

risk entries and revealing irregular patterns, trends, and anomalies, making risk assessment more reliable.



Automation & Artificial Intelligence

A crucial procedure that financial auditors perform is substantive testing. Substantive testing is the process of verifying that financial statements are both accurate and complete. This sort of test includes examining evidence regarding financial data, such as transactions, balances, and disclosures to ascertain if they are free from material misstatement. There are two categories of substantive tests:

The Test of Details: this refers to inspecting individual transactions and account balances one by one to establish their accuracy.

Analytical Substantive Procedures: this encompasses an examination of correlations between financial information and comparing them with expectations or industry standards for any inconsistencies.

In the past, it has not been feasible to substantively test all transactions or account balances in an audit due to the vast amount of data involved. Auditing each transaction would be time-consuming, expensive, and in many cases, unnecessary for providing reasonable assurance about financial statements.

A more common practice among auditors is using sampling methods to select a smaller number of representative transactions or balances from the entire population. With the right selection of sample, auditors can apply substantive tests over this small group thus allowing them to make conclusions concerning the overall population. Sampling procedures employ statistical or non-statistical techniques to ensure that any chosen sample is adequate to detect those material misstatements so that it can enable auditors to issue reliable opinions about complete financial statements. This method offers a balance between efficiency and efficacy, allowing auditors to give assurance without having to look at every transaction. However, this method involves inherent risks, as not all transactions are reviewed, potentially missing anomalies or errors.

Since substantive procedure only can verify a small group of the population, auditors can only provide reasonable assurance regarding the financial data. What if there is a technology that can solve the problem of time-consuming and the cost of performing substantive procedures? What if this technology could assist auditors and perform testing and therefore verify the entire population of the client's financial balances? What if with this technology, auditors can finally provide absolute assurance that the client's financial data is free from material misstatements? Such technology would potentially change the financial auditing landscape and disrupt how auditing has been performed since it was first introduced in 1845.



Artificial intelligence could be a disruptive factor in revolutionizing financial auditing. By leveraging artificial intelligence, machine learning, and automation, auditors can analyze the entire group of data instead of relying on traditional samplings, improving both the efficiency and reliability of audits. Traditionally, identifying outliers and trends in financial data was a manual process that was time-consuming and prone to human error. Machine learning algorithms now allow for quick identification of unusual transactions as well as small changes in data that may potentially cause risks like fraud or material misstatement,

allowing auditors to prioritize areas with higher risks. Reconciliation and transaction matching can benefit from automation by linking and matching from different datasets.

Natural Language Processing (NLP) has also revolutionized how auditors assess and analyze unstructured data such as journal entries, contracts, and invoices. Reviewing text-based data was labor-intensive and time-consuming for auditors. With NLP, auditors can efficiently and effectively extract relevant information from text-based documents and identify potential risks, assisting auditors in extracting deeper insights from the client data sets.

Benefits of Analytics, Automation, and AI in Audit

Accuracy and Efficiency

Incorporating analytics, automation, and AI in auditing brings several benefits. Auditors

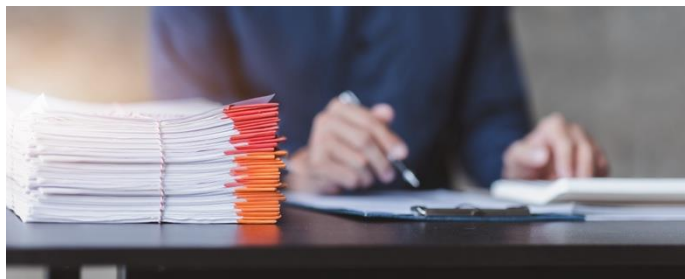


relying on traditional tools and methods in performing auditing procedures would spend countless hours and effort on repetitive tasks such as manual reconciliation and examination of financial data. By

leveraging advanced tools in assisting performing procedures, auditors can transition their efforts to areas that are more complex. Automation tools can benefit data processing by handling large datasets that minimize human error, ensuring a more accurate and reliable audit procedure. Additionally, machine learning algorithms can help auditors detect anomalies and complex patterns that may be missed or ignored by manual reviews. By flagging hidden trends in client financial data can bring a more comprehensive and complete audit.

Cost Savings

By automating repetitive tasks, firms can now optimize their staff allocation, where auditors can be deployed, and their expertise can be fully utilized. Audit project cycles can be shortened with AI-driven automation as audits can be



completed within a shorter time frame with fewer resources. Moreover, with the accuracy AI provides, the likelihood of human error is minimized which in turn minimizes the time needed for revisions and rework, ultimately lowering audit costs.

Risk Management

AI can be utilized to predict potential risks by analyzing historical data. Predictive analytics can be performed allowing auditors to mitigate risk. Additionally, AI algorithms can analyze large sets of transaction data to identify patterns or trends that may indicate fraudulent activities, thus allowing auditors to focus on these areas of higher risk.

Enhanced Decision Making

By automating routine and repetitive tasks, auditors can concentrate their efforts on strategic areas that require human judgment and expertise, further extending auditors into an advisory role that can provide clients with insights and recommendations.

Challenges and Risks

Data Privacy and Security

Financial audits are conducted using client data that are highly sensitive and require an extreme level of confidentiality. The risk of data breaches increases with the use of AI tools. Additionally, many AI tools are developed by a third-party vendor. The AI vendors will have to adhere to the strict data privacy and security standards laid upon between the auditing firm and

clients. The incorporation of AI and automation into the auditing process expands the digital footprint of auditing firms, which makes them more vulnerable to cyberattacks. Ensuring the security of client data is paramount to the success of AI integration into financial audits.

Client Trust and Perception

Clients may be skeptical about the use of AI in financial auditing, as financial auditing has been carried out in a conventional manner for so long, particularly if clients don't have visibility or understand the model algorithms being used. Fearing that the integration of AI could compromise the quality and scope of the audit, clients may be resistant to change. Communication of the benefits of AI along with as much model transparency as possible with clients is crucial when addressing concerns that clients may have regarding the technology.

Implementation Barrier

Audit firms have systems in place that may not be fully compatible with AI technologies. Integrating AI tools with existing systems and applications can be technically challenging, as they may require significant investment in the firm's IT infrastructure. Implementing AI in audits requires a substantial upfront investment. Smaller firms might be reluctant to bear the cost, potentially widening the gap between big firms and small firms. Additionally, staff auditors who are accustomed to traditional methods may resist the new technology. Effective communication and training programs are crucial for audit firms to successfully prepare their auditors to fully embrace the technology.

Industry Publications and Case Studies of Successful Implementation

One of the Big 4 public accounting firms, Ernst & Young, partnered with Microsoft to develop a suite of auditing analytical tools. EY Helix, a suite of tools tailored to Ernst & Young's business services, is designed to process large amounts of financial data, identify trends and insights, and ultimately assist auditors in performing a high-quality and efficient audit. EY Helix leverages AI in its analytical tools so that auditors can flag patterns that would otherwise be

potentially missed through manual analysis. Automation helps streamline the entire audit process. EY Helix has been carried out to all global EY firms, providing EY auditors with greater confidence in financial reporting, better identification of risks, and clearer insights regarding client operations.

With the emergence of more advanced data analytical tools and AI incorporated into the financial auditing process, the professional organizations of Certified Public Accountants, AICPA, and CPA Canada, jointly published a paper outlining how automation and AI are changing audit and the role of auditors. The main objective of the paper is to prepare auditors to use advanced tools in financial audits. It is monumental that the governing body of CPAs is fully embracing the emergence of AI and automation in auditing as financial auditing prepares to head into a new era.



What the Future Holds

As technology gets more advanced, the scary question of “Will human beings be replaced by AI?” arises. The answer to that question is yes and no. AI and automation will handle repetitive

tasks, therefore freeing up auditors for other tasks and projects. A change of skillset is crucial for auditors to stay competitive and relevant. AI and automation are tools, but the biggest drawback is that these advanced tools lack human judgment and expertise. To perform a comprehensive audit, understanding the client's business and insights requires professional judgment. With the help of AI, auditors will be able to ask better questions. "Why does this transaction occur?", "Why is the amount recorded at this period?", and "Why are there discrepancies between the inventory list and the general ledger?" are questions that AI cannot answer with absolute confidence. These questions require the auditor's professional judgment and experience.

Ultimately, AI and automation are here to augment, not to replace. The transition from data processor to strategic advisor will have an impact on audit professionals. The auditor's value will be interpreting AI-generated insights and providing clients with business process recommendations. The shift will require auditors to develop advanced skills in data analytics, technology, critical thinking, and strategic thinking.

Conclusion

The incorporation of AI, automation, and advanced data analytics into financial auditing signifies a transformative shift in the industry. While the transition poses challenges and risks such as data security, client trust, and implementation barriers, the unforeseen benefits like improved overall accuracy, efficiency, and overall quality of financial audits are substantial. Rather than replacing auditors, AI and automation will empower them to focus on complex judgment and strategic advising tasks that machines cannot replicate. To stay competitive and relevant in this new era of auditing, auditors must adapt and continuously learn skills in data analytics and technology. The future of auditing is one of collaboration between human expertise and advanced technology, promising a more dynamic, insightful, and robust audit process.

References

- American Institute of CPAs. (n.d.). *The Data-Driven Audit*. Retrieved from <https://us.aicpa.org/content/dam/aicpa/interestareas/frc/assuranceadvisoryservices/downloadable/documents/the-data-driven-audit.pdf>
- Brennan, L. (2024, February). *What AI Can Do for Auditors*. *Journal of Accountancy*. Retrieved from <https://www.journalofaccountancy.com/issues/2024/feb/what-ai-can-do-for-auditors.html#:~:text=At%20the%20220%2Demployee%20firm,in%2C%20and%20find%20the%20data>
- Wolters Kluwer. (n.d.). *Artificial Intelligence: Enhancing the Audit Lifecycle*. Retrieved from <https://www.wolterskluwer.com/en/expert-insights/artificial-intelligence-auditing-enhancing-audit-lifecycle>
- Ernst & Young. (n.d.). *EY Digital Audit*. Retrieved from https://www.ey.com/en_us/digital-audit?WT.mc_id=10820667&AA.tsrc=paidsearch&s_kwcid=AL!10073!3!602135800032!p!!g!!audit%20technology&gad_source=1&gclid=Cj0KCQjw8MG1BhCoARIsAHxSiQniyQtnuApbQiFDy0aV3Zo7gfhtneTwXxWwMYD_FWq06upPtZ2tZU4aAjJNEALw_wcB#tabs-94e800f4f1-item-8796878122-tab
- KPMG. (n.d.). *Revolutionizing Financial Services with Generative AI*. Retrieved from https://kpmg.com/us/en/industries/revolutionizing-financial-services-with-generative-ai.html?utm_source=google&utm_medium=cpc&utm_campaign=7014W000001vDU4QAM&cid=7014W000001vDU4QAM&gad_source=1&gclid=Cj0KCQjw8MG1BhCoARIsAHxSiQnccgCGT3rnTZr8NwbbLI3I1G_xSkjLgWWJDKmcS95UKGs81xqHM_MaAjVeEALw_wcB&gclsrc=aw.ds
- Ernst & Young. (2023, September). *EY Announces Launch of Artificial Intelligence Platform Following US \$1.4B Investment*. Retrieved from https://www.ey.com/en_gl/newsroom/2023/09/ey-announces-launch-of-artificial-intelligence-platform-ey-ai-following-us-1-4b-investment

About the Author



Kai Kai-Yu Chen

Kai Kai-Yu Chen is a financial audit and business analytics professional with a Master's degree in business analytics and a bachelor's degree in accounting. He has gained valuable experience through positions at Siemens Advanta Consulting, Deloitte, and PWC. Kai is passionate about leveraging his expertise in data analytics to optimize business performance and drive innovation.