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Artificial Intelligence and Its Impact on Internal Auditing: An Exploratory Study of Opinions from a Sample of Auditors at the University of Mosul

Ahmed Ghazi Taher [1] **Atallah A. Alhosban** [2]

[1] ***Assistant Lecturer.*** *Regional Studies Center/University of Mosul/ Iraq*
ahmed_ghazi@uomosul.edu.iq
[2] ***Associate Prof. Dr.*** *College of Business and Finance/ Al al-Bayt University/ Jordan.*
aalhosban@gmail.com

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Corresponding:
Ahmad Ghazi Taher

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Abstract

This research aims to identify the importance of applying artificial intelligence (AI) in reducing the time required to complete the internal auditing process and to examine the impact of using AI in gathering audit evidence. The study employed descriptive, analytical, and inductive methodologies to collect and analyze data. The University of Mosul was selected as the study population, with its internal auditors serving as the sample. Questionnaires were distributed to 52 auditors, with 51 responses received and analyzed using SPSS software. The key findings reveal a statistically significant effect of AI usage in reducing the time needed to complete internal audits, as well as a statistically significant impact on the collection of audit evidence. Among the primary recommendations is the enhancement of internal auditors' skills in modern technologies through continuous training courses aimed at developing computer proficiency and keeping pace with technological advancements in internal auditing.

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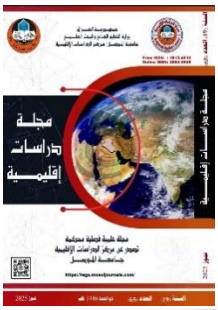
الذكاء الاصطناعي وتأثيره في التدقيق الداخلي: دراسة استطلاعية لآراء عينة من المدققين قي جامعة الموصل



أحمد غازي طاهر[١] عطا الله أحمد الحسبان[٢]

١ مدرس مساعد/ مركز الدراسات الإقليمية/ جامعة الموصل/ العراق ahmed_ghazi@uomosul.edu.iq
٢ أستاذ مشارك/ كلية المال والأعمال/ جامعة آل البيت/ aalhosban@gmail.com

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الملخص

يهدف البحث في التعرف على أهمية تطبيق الذكاء الاصطناعي في تقليل وقت العمل اللازم لإتمام عملية التدقيق الداخلي، والتعرف على تأثير استخدام الذكاء الاصطناعي في جمع ادلة الاثبات. وقد اعتمدت الدراسة على المنهج الوصفي والتحليلي والاستقرائي في تجميع وتحليل البيانات، فقد تم اختيار جامعة الموصل كمجتمع للدراسة والمدققين التابعين للجامعة كعينة للدراسة وتم توزيع الاستبانات على المدققين والبالغ عددهم (52) من مجموعة العينة وتمت الإجابة من قبل (51) وتم تحليلها واستخراج النتائج من خلال برنامج SPSS. ومن اهم النتائج التي توصل اليها يوجد أثر ذو دلالة إحصائية لاستخدام الذكاء الاصطناعي في تقليل وقت العمل اللازم لإتمام عملية التدقيق الداخلي، ويوجد أثر ذو دلالة إحصائية لاستخدام الذكاء الاصطناعي في جمع ادلة الاثبات. ومن اهم التوصيات تحسين المهارات على استخدام التقنيات الحديثة لدى المدقق الداخلي وذلك من خلال الدورات التدريبية المستمرة لتطوير المعلومات على استخدام تقنيات الحاسوب، ومواكبة التطورات الحديثة لاستخدام التكنولوجيا في عمل المدقق الداخلي.

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Introduction

In the era of modern technology, artificial intelligence (AI) has become indispensable across various vital and economic fields. AI has witnessed rapid advancements, making it one of the key drivers of digital transformation in multiple sectors. Today, AI serves as a critical tool relied upon by organizations to enhance operational efficiency and improve decision-making quality. Auditing is among the fields that have undergone radical transformations due to the progress in AI technologies and their applications. Traditionally reliant on manual and conventional review methods, auditing now significantly benefits from AI and big data analytics.

The integration of AI technologies in auditing can lead to a breakthrough in efficiency and accuracy, thereby improving quality and reducing human error. However, these advancements also introduce new challenges related to security, privacy, and data handling.

Several studies support this relationship, with recent research findings demonstrating a positive impact of AI adoption on audit quality, reduction in human bias, and enhanced auditors' ability to detect potential risks (Kokina & Davenport, 2017; Appelbaum et al., 2017).

Based on the above, this study aims to explore the impact of AI on internal auditing activities by surveying a sample of internal auditors at the University of Mosul. The study will analyze AI applications in auditing, associated challenges, and assess the potential benefits of deploying these technologies in an academic environment. Additionally, the research structure will follow these key themes: research methodology and literature review, theoretical framework, results analysis, and conclusions and recommendations.

Section One: Research Methodology and Literature Review

1. Research Methodology

A. Research Problem

After reviewing the internal control and auditing department at the university presidency and its affiliated college units (the study

sample), as well as conducting personal interviews with officials, it was found that there is no utilization of artificial intelligence (AI) technologies. Instead, reliance remains solely on traditional software when auditing the accounts of the university presidency and its affiliated colleges. This negatively impacts the auditing profession as a whole and auditors in particular. Accordingly, the following research questions arise:

1. What is the role of AI in improving the internal auditing profession and reducing errors in the auditing departments and units at the University of Mosul?
2. Do the internal control and auditing departments in the study sample have the capability to employ AI technologies to minimize errors, reduce time, and identify necessary audit evidence for internal auditing processes?

B. Research Significance

The importance of this study stems from the following:

1. The research highlights the significance of AI in delivering services to various entities that utilize this technology in their diverse economic activities.
2. AI technologies are among the most prominent contemporary variables that directly influence the professional practice of auditing in terms of speed, accuracy, error detection, and safeguarding assets from manipulation and loss.
3. Implementing AI technologies in universities enhances their operational efficiency and strengthens their reputation by keeping pace with information technology, ensuring continuous development in these departments.
4. The efficiency and effectiveness of financial data transparency depend on the extent to which AI technologies contribute to the development and improvement of the auditing system.

C. Research Objectives

This study aims to:

1. Investigate the perspectives of auditing professionals on the role of AI technologies in enhancing financial data transparency, reducing errors, and decreasing audit time.
2. Highlight the theoretical framework of AI and its applications in improving transparency and minimizing accounting errors.
3. Examine the importance of implementing AI in reducing the time required to complete internal audit processes.
4. Assess the impact of AI on gathering audit evidence.
5. Evaluate the extent of AI adoption in the studied university.
6. Explore the role of AI technologies in:

a) Their impact on internal audit quality.
b) Their effect on reducing audit errors.

D. Research Hypotheses

Based on the research framework, two main hypotheses were formulated and will be tested at a significance level of (0.05), as follows:

1. H_0: There is no statistically significant effect of using AI in reducing the time required to complete internal audit processes.
2. H_0: There is no statistically significant effect of using AI in gathering audit evidence.

E. Research Population and Sample

The research population consists of employees working in the internal control and auditing departments at the presidency of the University of Mosul and its affiliated colleges, totaling 52 auditors.

F. Research Methodologies

The researcher adopted the following two methodologies in this study:

1. Descriptive Scientific Approach:

Based on examining academic books, research papers, and various studies addressing the research variables related to the role of AI technologies in improving the auditing profession.

2. **Inductive Approach:**

Grounded in rigorous empirical scientific research through the development of a **questionnaire** to gather the perspectives of a sample of auditors working at the presidency of the University of Mosul and its affiliated colleges. A total of **52 questionnaires** were distributed to the selected sample, with **51 responses** collected for statistical analysis, hypothesis testing, and deriving results.

The following figure illustrates the **study model:**

Previous Studies

First: The study by **(Amroush, 2022)** titled "***The Role of Artificial Intelligence Technologies in Reducing Audit Risks: A Survey of Accounting Experts and Financial Controllers***". This study aimed to identify the prominent role of using artificial intelligence technologies in the audit process to reduce the level of audit risk and its components represented in detection risk, inherent risk and control risk from the perspective of accounting experts and financial controllers. The study relied on designing a questionnaire intended to collect primary analyzable data, and survey forms were distributed to a professional sample of seventy-three individuals both manually and electronically. Study results: The study reached several results, the most important of which are that artificial intelligence technologies help in determining the optimal timing for examination and verification procedures, and enable auditors to expand the size of the audited sample without increases in effort and cost and reduce the risk of material errors, emphasizing the role of using artificial intelligence technologies in assessing and reducing detection risk, inherent risk and control risk, which enables auditors to reduce audit risk levels to an acceptable level. This study helps the researcher by identifying the role of artificial intelligence technologies in reducing audit risks.

Second: The Study by **(Al-Samarrai and Al-Shrida, 2020)** title**:** "***The Role of Artificial Intelligence Technologies Using Digital Auditing in Achieving Audit Quality and Supporting Audit Strategy from Auditors' Perspective (A Field***

Study in Audit Firms in the Kingdom of Bahrain)". This study aimed to define the role of artificial intelligence technologies using digital auditing in achieving audit quality and supporting the audit strategy used in audit firms in the Kingdom of Bahrain. The study relied on designing a questionnaire intended to collect primary analyzable data, and survey forms were distributed to audit firms in the Kingdom of Bahrain.

Study results: The study reached several results, the most important of which are that there is a relationship between artificial intelligence technologies and the audit process in audit firms operating in the Kingdom of Bahrain where the use of artificial intelligence technologies supports the audit process, and that the progress in using information and communication technology has imposed a new reality on audit firms that requires auditors to keep pace with this development and move towards benefiting from information and communication technology in providing audit services. This study helps in identifying the role of artificial intelligence technologies using digital auditing in achieving audit quality.

Third: The Study by **(Al-Sayyed et al., 2021)** title**:** "***The Effect of Artificial Intelligence technologies on audit evidence***". This study had a primary objective of verifying the impact of artificial intelligence on audit evidence from the perspective of certified auditors in information technology companies in Jordan.

The data used in this study were obtained from primary sources collected through research instruments. The study utilized primary data gathered from the study sample via questionnaire, defining the questionnaire as measurement tools requiring individuals to answer a set of questions or respond to a series of statements. The employed questionnaire consisted of a Likert scale aimed at obtaining in-depth information and data that were analyzed to achieve the study's objectives.

Study results: The study concluded that while artificial intelligence offers a promising future outlook, most researchers and organizations need to adopt the necessary skills and knowledge. From the researchers' experience, there is a need to assess AI's impact on audit evidence. Therefore, this study aimed to explore AI's effect on audit evidence to acquire relevant skills and knowledge.

This study helps the researcher understand the impact of artificial intelligence technologies on audit evidence.

Fourth: The Study by **(Rodrigues et al., 2023)** title: "***The Impact of Artificial Intelligence on Audit Profession***". This study aimed to assess the implications related to the application of artificial intelligence in this field. To further discuss the study's subject, an empirical study was conducted to evaluate the consequences resulting from the use of these tools. To achieve the specified objectives of this work, a qualitative method was employed through a survey in the form of a questionnaire.

Study results: Among the most important findings reached by the study are that artificial intelligence will have an impact on the current approach to auditing, and consequently there will be implications in terms of the efficiency and effectiveness of audit procedures, audit sampling, and the detection of material misstatements resulting from fraud or error, as well as in the cost-benefit ratio for the profession. Additionally, auditors recognize that introducing these mechanisms into the profession may make it possible to conduct audits using a continuous approach. This study helps the researcher understand the impact of artificial intelligence on the audit profession.

Fifth: The Study by **(Zemankova, 2019)** title: "***Artificial Intelligence in Audit and Accounting: Development, Current Trends, Opportunities and Threats - Literature Review".*** This study aimed to provide an analysis of audit tasks that benefit from artificial intelligence implementation, with particular focus on risk assessment. Another objective was to identify the artificial intelligence techniques used in auditing and accounting.

Study Results: Among the most significant findings of the study is that artificial intelligence in accounting and auditing possesses tremendous potential to enhance efficiency, reduce errors, and provide accountants and auditors with more time to focus on more complex, value-added tasks rather than repetitive, time-consuming, rule-based activities. This study assists the researcher in understanding artificial intelligence in auditing and accounting, including its development, opportunities, threats, and current trends.

What distinguishes this study from previous studies:

This study examines artificial intelligence and its impact on auditing, and is distinguished from previous studies in terms of its research population and sample. Specifically, it focuses on **internal auditing at the University of Mosul** and AI's influence on it. The University of Mosul is among the institutions that keep pace with technological advancements in its operations. Therefore, this study highlights the **potential use of AI in internal auditing** and its impact on the audit process.

Second Axis: Theoretical Research Framework – Artificial Intelligence and Internal Auditing: The Concept of Artificial Intelligence

Technological developments have brought about substantial and rapid changes in economic environments, accompanied by the emergence of new information system applications and innovative design standards for these systems. These advancements have proliferated due to several factors, most notably the pursuit by nations to keep pace with globally emerging technological systems and the availability of vast amounts of data for machine learning, leading to the development of artificial intelligence (AI) algorithms. AI stands as one of the most prominent modern applications of information systems, representing a key modern science born from the intersection of the technological revolution in

computer science and automated control on one hand, and logic, mathematics, linguistics, and psychology on the other. In this context, AI serves as an umbrella for various technologies that enable machines to simulate human intelligence (Amirham, 2022, 255).

AI has been defined as **the ability of a machine to perform activities typically expected of the human brain**. It aims to develop intelligent machines capable of interacting in a manner similar to humans, making it essentially a simulation of human cognition (Ali, 2023, 27).

From the researcher's perspective, **AI is an interactive and simulative process between machines and the human mind, designed to achieve fast and accurate results by leveraging stored information and data within a database.**

Characteristics of Artificial Intelligence. The most important characteristics of artificial intelligence are (Amroush, 2022, 172):

1. It uses an approach similar and somewhat identical to the human method in solving complex problems, characterized by simultaneity, accuracy, and high speed in receiving and processing hypotheses, the ability to find a solution to every problem, as well as the ability to process non-numeric symbolic data.
2. Artificial intelligence is also characterized by the difficulty of its preparation, as it requires representing huge amounts of specialized knowledge in specific fields. Among its objectives is simulating humans in their way of thinking, behavior or response, and creating new, creative and innovative ideas.
3. Artificial intelligence works to immortalize human experiences and provide multiple alternatives to the system, allowing the dispensation of experts and compensating for their expertise. It also helps eliminate feelings of fatigue and boredom and reduces reliance on human energy.
4. Autonomy and prediction: This is the ability of artificial intelligence to act independently, as AI systems are capable of performing complex tasks without effective human control or even supervision.

The Concept of Internal Auditing

The Institute of Internal Auditors (IIA) defines internal auditing as:"An independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes" (Al-Ramahi, 2017, 19).

Internal auditing and control can be defined as: The system comprising a set of policies and procedures adopted by the board of directors, management, and relevant authorities within the organization. This system aims to ensure the

achievement of organizational objectives with an appropriate degree of regularity and efficiency while safeguarding assets (Ghazal et al., 2018, 12).

Definition of Electronic Auditing

Electronic auditing is defined as: "The utilization of computer technologies and information technology to perform various auditing tasks, including planning, execution, archiving, and documentation of audit work, in addition to conducting financial analyses to examine the financial status of the audited entity" (Anbar & Mohammed, 2016, 47).

Dimensions of Artificial Intelligence Technology in Auditing

There are five dimensions as a framework for applying artificial intelligence technology in auditing, and these dimensions were relied upon to achieve the research objectives as follows (Jakovljevic, 2022, 278):

1. Gaining initial understanding of the entity being audited during the acceptance or continuation of the audit engagement and preliminary planning.
2. Understanding internal controls.
3. Monitoring risk assessment.
4. Performing substantive tests.
5. Compiling the audit report.

The first phase of auditing involves understanding the audited entity when accepting or continuing the audit engagement and preliminary planning. The AI-based tool should be capable of creating a comprehensive report after analyzing the financial position of the entity. The second phase relates to understanding internal controls. Although auditors are not required to express an opinion on them unless agreed upon, they must understand them to assess the reliability of audit evidence. AI helps in analyzing unstructured data from reports quickly and efficiently compared to the traditional approach that requires significant time and effort. The third phase relates to evaluating control risks. AI can analyze accounting records to detect violations and inconsistencies, thereby enhancing audit accuracy. The fourth phase refers to performing substantive tests to confirm account balances. AI provides auditors with clearer insight into data sources and increases the reliability of tests. The final fifth phase relates to compiling the audit report. AI can synthesize conclusions, prepare the report in the required format, and formulate audit opinions based on the specified results (Jakovljevic, 2022, 278).

Artificial Intelligence and Decision Making

A 2016 study proposed the idea of developing an electronic program that performs all audit tasks, starting from planning, through selecting sample sizes and documenting working papers, to obtaining an audit report and a report on evaluating the effectiveness of internal controls. The results showed that adopting AI technology in audit process stages leads to audit mission success and quality

improvement. According to a 2019 study, AI applications in business organizations improve decision-making processes, solve all administrative problems, reduce costs, and improve quality, helping the organization survive and enhance competitiveness (Saad, 2021, 6).

From the researcher's perspective, AI contributes to supporting decision-making by improving audit accuracy and administrative process efficiency, which enhances output quality and reduces effort. It is also considered a strategic tool to increase institutional competitiveness and ensure keeping pace with technological developments.

Auditing and Artificial Intelligence-Based Systems

The standard decision-making process should include three main iterative stages: intelligence, design, and choice. The intelligence stage involves gathering data, identifying objectives, diagnosing problems, analyzing historical data, and structuring problems. In the design stage, data is processed, objectives are determined, alternatives are generated, and the risks or values associated with these alternatives are evaluated. In the choice stage, statistics about alternatives are produced, outcomes are simulated, alternatives are explained, and one alternative is selected and justified. Artificial intelligence forms an essential part of decision support tools that are continuously developed and adopted in the technical and administrative processes of modern companies and professions, including auditing. With the increasing complexity of transactions and global population growth, auditing will increasingly rely on advanced software. Therefore, artificial intelligence and expert systems have become indispensable tools in current audit processes. Over the past two decades, significant efforts have been made to develop complex artificial intelligence systems (such as expert systems and neural networks) to assist auditors in decision-making. These systems aim to improve judgment accuracy by reducing biases and omissions that may occur in manual processes. Although these systems are considered decision-support tools for final audit judgments due to the complexity and sensitivity of required judgments, some studies indicate that auditors may become overly reliant on the outputs of these systems. Ultimately, the auditor remains responsible for the final judgment. Artificial intelligence tools serve as "agents" used by auditors to perform specific tasks, and auditors must verify the appropriateness, reliability, and effectiveness of these tools. The use of artificial intelligence-based systems in decision-making is a double-edged sword. Auditors may be held accountable for insufficient use of modern tools if a judgment proves incorrect, just as they may be criticized for excessive reliance on an expert system that issues an incorrect judgment. The expected benefits of using artificial intelligence in auditing include improved efficiency, effective structuring of audit tasks, enhanced decision-making and communication, improved staff training, development of junior staff

expertise, and reduced decision-making time. However, there are potential drawbacks such as prolonged decision-making processes resulting from exploring more alternatives, the high cost of building and maintaining systems, discouraging the development of professional judgment skills, and the risk of tools being transferred to competitors or used against auditors in court. After reviewing current literature on the development of artificial intelligence and its impact on auditing, it is necessary to consider auditors' adoption of specific components of these systems (such as expert systems and neural networks) in more detail (Omoteso, 2012, 8491).

Artificial Intelligence Technologies Used in the Auditing Process

The artificial intelligence technologies employed in the auditing process can be summarized as follows:

Expert Systems: These are information systems based on expertise and knowledge, utilizing specialized applications to assist humans in reasoning and problem-solving (Amroush, 2022, 173). These systems can be applied in accounting and auditing, relying on a knowledge base that incorporates the expertise and experiences of accountants. They possess the capability to integrate the skills of multiple experts to enhance auditing services across various stages of the process, such as planning, evaluating internal control systems, and identifying audit risks to assess internal controls. Additionally, they are distinguished by their ability to justify inquiries and interpret the results they derive (Amroush, 2022, 173).

Artificial Neural Networks: These are data processing mechanisms that mimic the functioning of natural neural networks in humans or living organisms, specifically the human nervous system (Amroush, 2022, 173). The use of artificial neural networks in the auditing process can contribute to developing a strategic audit plan aimed at completing the audit within a specified timeframe. Auditors rely on this plan to allocate work among audit team members and execute appropriate audit procedures to reduce audit risk to an acceptable level (Amroush, 2022, 173).

Algorithms: These are sets of repeated, programmed instructions designed to solve problems, operating in a manner that emulates human problem-solving methods. They involve modifying and reorganizing components using techniques such as transformational reproduction and natural selection. This technology provides methods for exploring all possible data combinations to identify the correct non-numeric variables that represent the optimal structure for a given problem. They are particularly useful in scenarios where there are thousands of potential solutions that must be evaluated to find the optimal one (Amroush, 2022, 173).

Risks and Benefits of Artificial Intelligence

Several researchers have investigated the potential drawbacks of artificial intelligence in auditing. The potential use of AI to significantly reduce the need for human auditors may be most consequential, as companies may no longer require human auditors to examine their books once AI becomes more efficient at identifying errors and anomalies in financial data. This could lead to substantial job losses in the accounting audit sector and a decline in the quality of financial audit processes. According to an Oxford University study cited by the Institute of Chartered Accountants in England and Wales, 95% of accountants risk losing their jobs due to technological advancements. Moreover, AI may threaten financial data security. As AI improves at identifying patterns in data, it may become capable of detecting sensitive information that should not be exposed. If such information falls into the wrong hands, it could be used to exploit financial institutions or commit other crimes. The literature also highlights the advantages of implementing AI. It has become increasingly difficult to integrate vast amounts of structured data and gain insights into a company's financial and non-financial performance. Consequently, auditing is particularly well-suited for data analytics and AI applications. Automating audit processes can accelerate audit completion while maintaining data integrity. Automated analysis of accounting entries represents one AI application, where using AI to generate automatic entries helps reduce human errors and sometimes detect fraud, thereby minimizing human intervention (Noordin et al., 2022, 4).

From the researcher's perspective, while AI offers significant benefits in accelerating and improving audit quality, it poses real risks related to data security and the diminishing role of human auditors. Therefore, it is essential to balance the use of technological efficiency with maintaining professional standards and human oversight.

Benefits of Integrating Artificial Intelligence Technologies in Audit Processes

The International Auditing and Assurance Standards Board (IAASB) has acknowledged the rapid technological advancements, particularly concerning big data and its potential impact on the audit process (IAASB, 2016). Similarly, the Association of Chartered Certified Accountants (ACCA) (2015) recognized the influence of big data on the audit industry and called for audit firms to adapt their practices by adopting modern technologies, while emphasizing that auditors must exercise professional judgment when conducting audits. Although traditional audit methodologies rely on human judgment, the automation of certain tasks necessitates modifications to audit plans to accommodate the shift from manual to automated processes. Consequently, additional testing becomes essential to ensure the effectiveness of controls over algorithms and machine learning decision-making processes (Aitkazinov, 2023, 118).

Artificial Intelligence in Auditing

Artificial Intelligence (AI) reduces the time required for lengthy client document audits and enhances the efficiency and accuracy of verification and inventory calculation processes. However, AI cannot replace auditor judgment, as auditors remain essential for assessing data completeness, evaluating the strength of internal controls, and determining the reasonableness of asset valuations. Therefore, auditors must adopt technology as a tool to enhance their capabilities and effectiveness in performing their tasks. Auditors are still needed to determine data completeness, assess internal control effectiveness, and evaluate the reasonableness of asset valuations, as these tasks require human intuition and interaction—auditor intuition remains indispensable (Meitasari & Audrey, 2023, 96). AI helps eliminate human error during initial data entries, thereby increasing the reliability of accounting information. Audit tasks, among other activities, require decision-making, sample selection, and evaluation. Thus, applying AI during audits can improve efficiency and further reduce human error. In general, AI may be particularly useful in audit stages involving rule-based tasks, especially those that are time-consuming. Expert systems enhance audit effectiveness and efficiency, enabling auditors to use them for audit planning, evidence gathering and evaluation, and opinion formation. In its early stages of application, AI can suggest materiality thresholds, assess internal control quality, evaluate the adequacy of reserves or provisions, and more (Zemankova, 2019, 149).

Factors Influencing the Adoption of Artificial Intelligence Technology in the Auditing Profession

Auditors are influenced by artificial intelligence from two distinct aspects. On one hand, auditors are affected by all changes occurring in their clients' environments. As clients increasingly adopt innovative new technologies, auditors are directly impacted by the need to adopt artificial intelligence technologies to perform their work in line with client expectations, keep pace with developments, and improve the quality and accuracy of their services. On the other hand, artificial intelligence is expected to bring changes to all stages of auditing, starting from audit project planning, through fieldwork, and ending with reporting audit observations. Audit clients now have increased expectations from auditors, due to the need for more support as their businesses grow and new risks emerge. However, this is not the only factor affecting the auditing profession's adoption of artificial intelligence technology. Regardless of the necessity to meet stakeholder and client requirements, the auditing profession cannot continue without adapting to surrounding changes, most importantly those related to technological developments. For example: How can auditors examine the massive and growing amount of data available to clients without using modern technologies? , Is it

possible to plan the audit process without taking into account the risks arising from these changes in clients' business models? , What if clients start providing audit evidence in other forms?, How can auditors perform their function if they don't keep up with these changes?, All these questions call us to review the opportunities and solutions that artificial intelligence technologies provide to auditors (Samhidan & Salmo, 2021, 7).

From the researcher's perspective, the adoption of artificial intelligence in the auditing profession has become a necessity rather than an option due to changes and developments in business models, because adapting to these technologies enables auditors to efficiently handle increasing data, speed, and accuracy in completing work.

The Impact of Artificial Intelligence on the Nature of Audit Evidence

The current procedures available to auditors for gathering various types of information include inquiry, inspection, observation, confirmation, recalculation, reperformance, and analytical procedures. Although auditing standards emphasize a certain level of materiality, group discussions and expert participation may only provide limited audit evidence. When performed manually, external entity representatives may fail to access substantive information. Consequently, auditing primarily depends on auditors and the audit team. The emergence of artificial intelligence has created opportunities for broader participation of audit experts, paving the way for exploring additional methods of collecting audit evidence. Under these new circumstances, expert conclusions can be introduced as a new form of evidence for financial statement audits, similar to litigation evidence. Expert conclusions, primarily applied in legal practice, involve specialists employing their professional expertise and modern science-based technologies to inspect, analyze, and make judgments regarding specific matters arising from litigation procedures to produce written conclusions. As a potential new category of audit evidence, expert conclusions could also be applied in auditing practices. Artificial intelligence provides massive data information to external financial accounting specialists, finance experts, and computing professionals, who can leverage their professional knowledge to conduct in-depth analysis of accounting information through data mining and issue definitive opinions about the overall quality of accounting information. Auditors may use expert conclusions as audit evidence moving forward, not limited to individual capacity in gathering evidentiary matters. This could ensure the breadth and depth of auditing practices beyond accounting practices while improving audit quality and ensuring the validity and reliability of accounting information (Gao & Han, 2021, 5).

From the researcher's perspective: Artificial intelligence contributes to the development of audit evidence by enabling broader expert participation and comprehensive data analysis, thereby enriching the evidence-gathering process. It enhances output reliability through precise conclusions based on specialized knowledge and advanced technologies.

The Role of Artificial Intelligence in Enhancing Audit Quality

The use of artificial intelligence (AI) technologies can reduce audit risks related to expressing inaccurate opinions or failing to detect material misstatements in internal control systems or financial data, which may occur when relying solely on limited statistical sampling. The significance of AI technologies in this context stems from their superior capability to examine entire statistical populations, regardless of size, enabling auditors to identify unusual or suspicious transactions that might be difficult to detect through sampling. Enhancing efficiency represents one of the most notable benefits of AI in auditing. AI can help auditors achieve the highest levels of assurance while reducing time and effort. For instance, instead of spending extensive hours reviewing contracts and documents, machines can complete these tasks at unprecedented speeds. This allows auditors to dedicate more time to higher-value activities that cannot be automated, such as client communication, relationship building, and gaining deeper insights into client needs (Samhidan & Salmo, 2021, 9).

From the researcher's perspective:

AI contributes to improving audit quality by mitigating risks associated with partial sampling and enabling comprehensive data analysis. It also allows auditors to focus on professional judgment and interpersonal aspects that enhance understanding of the business environment and client requirements.

Artificial Intelligence and Audit Efficiency

The quality of audit services significantly impacts the continued engagement with audit firms and the level of efficiency and credibility these firms achieve, particularly those offering distinguished services. Artificial intelligence (AI) contributes to addressing many daily business challenges, enabling firms to operate more effectively and efficiently. AI enhances delivery speed by performing large-scale tasks that humans cannot accomplish simultaneously. It excels in its ability to detect errors immediately upon occurrence, ensuring work accuracy, as well as analyzing vast amounts of data and establishing policies to ensure consistency. Additionally, AI can identify and report incorrect financial data for rectification. Implementing AI technologies requires qualified professionals to design, build, and test these systems, such as expert systems. Hence, the importance of AI technologies lies in developing auditors' competencies, assisting them in enhancing the audit process through scientific knowledge and professional expertise. Consequently, AI augments human

intellectual, creative, and productive capabilities alongside the evolution of machine intelligence and tools, with both contributing to mutual improvements (Saad, 2021, 7).

From the researcher's perspective:

AI serves as an effective tool for improving audit efficiency and quality, enabling auditors to detect errors and analyze data with precision and speed. It also elevates professionalism by allowing auditors to focus on analytical and creative aspects of their work.

Section Three: Field Study

Mechanisms and Procedures for Analyzing and Processing Questionnaire Data

To facilitate the procedures for statistical data analysis, a response scale was determined, with the researcher providing five response alternatives for each question: (Strongly Agree, Agree, Moderately Agree, Disagree, Strongly Disagree) to ascertain the opinions of the study sample members regarding the impact of each variable. These were measured using a five-point Likert scale (Five Point Likert Scale) for the study sample responses, where the numbers (1,2,3,4,5) were assigned. Based on this, the arithmetic means obtained by the study will be handled to interpret the data as follows: The arithmetic means are divided into three categories: Category (1 - 2.33) indicates a low or weak degree, Category (2.34 - 3.67) indicates a moderate degree, Category (3.68 - 5) indicates a high or strong degree

Describe research variables, diagnose them and test research hypotheses

First: Description of the individuals surveyed: It can be said based on the data of Table (1) to analyze the demographic factors of the research sample, that the academic qualification came with the highest percentage of bachelor's degree by (94.1%), the higher diploma by (3.9%), and the doctorate by (2%), while the specialization came accounting specialization by the highest percentage, reaching (78.4%), while the specialization of financial and banking sciences came by (21.6%), while the job title came with the highest percentage of the title of a senior auditor by (54.9%), and the title of a senior accountant came by (23.5%), and the title of M. Audit Manager by (5.9%), the title of Senior Audit Manager by (3.9%), the title of Audit Manager by (3.9%), and the title of M. Account Manager by (3.9%), and came with the lowest percentage of Account Manager and another by (2%), while the number of courses in the field of audit came with the highest percentage of one course by (60.8%), and two courses by (23.5%), if no course was participated in by (9.8%), four courses were (3.9%), it was the lowest percentage It is three cycles by (2%), while the number of years of work as an auditor came with the highest percentage of 5-10 years by (66.7%), and from 10-15 years by (19.6%), and the lowest 5 years by (11.7%), and the lowest percentage

was from 15-less than 20 years by (2%), while in the field of experience in the number of years of work as an accountant varied among the members of the sample, where the percentage of (66.7%) did not work as an accountant, followed by (13.7%) worked from 2-5 years, and the percentage (9.8%) Work less than 2 years, and (7.8%) work from 10-13 years, and the lowest percentage (2%) for those who worked from 6-9 years.

Table (1)
Description of the members of the sample surveyed

1- Academic Qualification							
Doctor		Master		Higher Diploma		Bachelor	
t	Ratio	t	Ratio	t	Ratio	T	Ratio
1	2%	-	-	2	3.9%	48	94.1%
Diploma		High school		Other			
t	Ratio	t	Ratio	t	Ratio		
-	-	-	-	-	-		
2-Specialization							
accounting		Banking & Finance		Business Administration		Economy	
t	Ratio	t	Ratio	t	Ratio	T	Ratio
40	78.4%	11	21.6%	-	-	-	-
Other							
t	Ratio						
-	-						
3. Job Title										
Senior Audit Manager		Audit Manager		M. Audit Manager		Senior Auditor		Checker	
t	Ratio	t	Ratio	t	Ratio	t	Ratio	t	Ratio
2	3.9%	2	3.9%	3	5.9%	28	54.9%	-	-
M. Auditor		Senior Account Manager		Account Manager		M. Account Manager		Senior Accountant	
t	Ratio	t	Ratio	t	Ratio	t	Ratio	t	Ratio
-	-	1	2%	-	-	2	3.9%	12	23.5%
accountant		M. Accountant		Other					
t	Ratio	t	Ratio	t	Ratio				
-	-	-	-	1	2%				
4- Number of courses in the field of auditing									
or a cycle		One Course		Two courses		Three courses		Four courses or more	
t	Ratio	t	Ratio	t	Ratio	t	Ratio	t	Ratio
5	9.8%	31	60.8%	12	23.5%	1	2%	2	3.9%
5. The number of years you worked as an auditor									

Less than 5 years old		5- Less than 10 years		10- Less than 15 years old		15-less than 20 years old		20-less than 25 years old	
t	Ratio	t	Ratio	t	Ratio	t	Ratio	t	Ratio
6	11.7%	34	66.7%	10	19.6%	1	2%		
25 years and above									
t	Ratio								
-	-								
6- Experience Number of years working as an accountant									
Less than 2 years		2-5 years		6-9 years		10-13 years		14 years and above	
t	Ratio	t	Ratio	t	Ratio	t	Ratio	t	Ratio
5	9.8%	7	13.7%	1	2%	4	7.8%	-	-
I didn't work									
t	Ratio								
34	66.7%								

Source: Prepared by the researcher in the light of the questionnaire form

Second: The attitudes of the respondents towards the indicators of the two dimensions of the research

The attitudes of the respondents towards the various paragraphs contained in the questionnaire form are as follows:

1. Their attitudes towards artificial intelligence indicators: Table (2) reflects the frequencies, arithmetic means and standard deviations of the overall indicators of this dimension, in addition to reflecting the rate of these circles and the rate of these deviations as well, which amounted to (4.421) and (0.440) respectively. It appears through the high values of these two rates or the rise of their values in general as far as this relates to each of the indicators concerned, especially the indicator (X3), which states **(the use of artificial intelligence to reduce the time and effort on the internal auditor),** as the amount of approval on this indicator amounted to (86.3%) and the percentage of strongly agree (7.8%) while the disagreement on this indicator was (zero) and the percentage of approval was an average degree of (5.9%) and all this came with an arithmetic mean of (4.019) and a standard deviation of (0.373), and that the indicators mentioned captured the agreement of all respondents.

Table (2)
Attitudes of the respondents from artificial intelligence (at the University of Mosul)

Paragraph / Variables	Strongly disagree		Disagree		Moderate Agree		agree		Strongly agree		Middle Arithmetic	Deviation Normative
	t	%	t	%	t	%	t	%	t	%		
X1	-	-	-	-	-	-	9	17.6	42	82.4	4.823	0.385
X2	-	-	-	-	8	15.7	41	80.4	2	3.9	3.882	0.431
X3	-	-	-	-	3	5.9	44	86.3	4	7.8	4.019	0.373
X4	-	-	-	-	4	7.8	40	78.4	7	13.7	4.058	0.465
X5	-	-	1	2	2	3.9	40	78.4	8	15.7	4.078	0.523
X6	-	-	1	2	4	7.8	36	70.6	10	19.6	4.078	0.594
X7	-	-	-	-	-	-	8	15.7	43	84.3	4.843	0.367
X8	-	-	-	-	-	-	9	17.6	42	82.4	4.823	0.385
X9	-	-	-	-	-	-	8	15.7	43	84.3	4.843	0.367
X10	-	-	-	-	2	3.9	8	15.7	41	80.4	4.764	0.513
General rate	**-**		**0.2**		**4.5**		**47.64**		**47.45**		**4.421**	**0.440**

Source: Prepared by the researcher in the light of the results of electronic analysis.

2. Their attitudes towards internal audit indicators: The previous table also included a number of standard rates and deviations, Table (3) included similarities to them as well, but this time they concern the quality of accounting information, and through examining these rates, it is clear that there is satisfaction or general agreement among the respondents Their opinions towards the indicators of this variable as well, especially the indicator (X20), which was the highest percentage and stipulates **(organizing the audit process using artificial intelligence within effective steps that contribute to improving the audit process)**, although this is in a different manner from one indicator to another, as evidenced by the high rate of arithmetic means and the rate of standard deviations of the indicators of (4.098) and (0.360) respectively on the one hand, or the increase in arithmetic means and standard deviations also to the extent that they relate to each of the indicators surveyed on the other hand.

Table (3)
Attitudes of respondents from the internal audit index

Paragraph / Variables	Strongly disagree		Disagree		Moderate Agree		Agree		Strongly agree		Middle Arithmetic	Deviation Normative
	t	%	t	%	t	%	T	%	t	%		
X11	-	-	-	-	4	7.8	8	15.7	39	76.5	4.686	**0.616**
X12	-	-	-	-	1	2	23	45.1	27	52.9	4.509	**0.543**
X13	-	-	-	-	3	5.9	9	17.6	39	76.5	4.705	**0.575**
X14	-	-	-	-	5	9.8	38	74.5	8	15.7	4.058	**0.506**
X15	-	-	-	-	2	3.9	41	80.4	8	15.7	4.117	**0.431**
X16	-	-	-	-	2	3.9	41	80.4	8	15.7	4.117	**0.431**
X17	-	-	-	-	2	3.9	40	78.4	9	17.6	4.137	**0.448**
X18	-	-	-	-	3	5.9	39	76.5	9	17.6	4.117	**0.475**
X19	-	-	-	-	1	2	40	78.4	10	19.6	4.176	**0.433**
X20	-	-	-	-	1	2	44	86.3	6	11.8	4.098	**0.360**
General rate	-		-		4.7		63.3		31.9		4.272	0.481

Source: Prepared by the researcher in the light of the results of electronic analysis.

Third: Testing research hypotheses:

1- **The first sub-hypothesis:** This hypothesis states **(there is no statistically significant effect of using artificial intelligence in reducing the working time required to complete the internal audit process).**

1- In order to identify the nature of the correlation between reducing the working time required to complete the internal audit process and the use of artificial intelligence, the data of Table (4) indicate a positive significant correlation as the value of the total correlation coefficient was (0.288) at a significant level of (0.05), based on what was presented above, the hypothesis is rejected and the following alternative hypothesis is accepted **(there is a statistically significant effect of using artificial intelligence in reducing the working time required to complete the internal audit process).**

Table (4)
Correlation coefficient between reducing the working time required to complete the audit process and the use of artificial intelligence

Dependent Dimension Independent Dimension	Internal Audit
Artificial Intelligence	(0.288)**

** Significant at (0.05) N=51

Source: Prepared by the researcher in the light of the results of the electronic calculator.

The second sub-hypothesis: This hypothesis states **(there is no statistically significant effect of using artificial intelligence in collecting evidence).**

The data of Table (5) indicate that there is a significant impact of the use of intelligence in collecting evidence, as the coefficient of (**β**) reached (0.339), which indicates that the change in the use of artificial intelligence by one unit is accompanied by a change of (0.339) in the collection of evidence, and this is supported by the calculated value of (F) of (4.447), which is greater than its tabular value (4.04) with a significant level of (0.05).), and degrees of freedom (1.49) and this indicates an effect between the two dimensions, while the coefficient of determination was (0.083), and this means that (8.3%) of the amount of differences in the amount of evidence collection is caused by the use of artificial intelligence, and the remaining percentage is due to unknown or non-internal random effects in the research model, and the calculated value of (T), which is greater than its tabular value, indicates the importance of the effect of the independent variable in the approved variable, and based on what has been presented above The hypothesis is rejected and the following alternative hypothesis is accepted **(there is a statistically significant effect of using AI in collecting evidence).**

Table (5)

The impact relationship between AI and internal audit

Independent dimension / Supported dimension	Artificial Intelligence				
	Recommendation 2	D. F.	F		B
			Calculated	Tabular	
Internal Audit	0.083	1 49	4.447	4.04	0.339 (3.896)

At the level of significance (0.05) (2.109) T calculated N = 51

Source: Prepared by the researcher in the light of the results of electronic analysis.

Results and Recommendations:

Results:

The research findings can be summarized as follows:

1. There is a statistically significant impact of using artificial intelligence in reducing the working time required to complete the internal audit process.
2. There is a statistically significant impact of the use of artificial intelligence in collecting evidence.
3. AI can easily detect errors that are difficult for an auditor to detect.
4. The use of artificial intelligence affects the increase in the quality of internal audit.

Recommendations:

1. Improving the skills of the internal auditor on the use of modern technologies through continuous training courses to develop information on the use of computer technologies.
2. Keeping abreast of recent developments in the use of technology in the work of the internal auditor and directing them to use artificial intelligence in audits.
3. Encouraging and developing scientific studies and research on the use of artificial intelligence in the field of internal auditor work and deepening.
4. Work to remove the obstacles facing the internal auditor when using modern technologies, including artificial intelligence in the auditing process, including the provision of advanced programs, applications and computers.

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