



Challenges of Artificial Intelligence and its Impact on the Quality of Internal Auditing and its Impact on the Performance of Financial Institutions.

Dr. Amel Merzah Sakhil¹, Suhad Abdul Meer Kadhim²,
Fatimah Flayyih Oudah³

^{1,2,3}Polytechnic college / Al- Qadisiyah Al- Furat Al - Awsat
Technical University, Iraq

dw.amel@atu.edu.iq

suhad.ameer.idi@atu.edu.iq

Fatimah.oudah.idi@atu.edu.iq

Abstract. The study aims to demonstrate the extent to which the challenges of artificial intelligence technologies affect the quality of internal audit and their impact on the performance of financial institutions. With the growth of applications of artificial intelligence in financial operations, institutions have begun to increasingly rely on automation, intelligent data analysis, and machine learning in carrying out their daily tasks. While these technologies are expected to enhance efficiency and speed, they pose major challenges for internal audit units, including understanding complex systems, difficulty tracking algorithms, The possibility of technical biases or inaccurate automated decisions. The problem of the study is to identify the challenges posed by artificial intelligence technologies to the quality of internal audit, which may directly or indirectly affect the effectiveness and sustainability of the performance of financial institutions, and the extent of the readiness of internal audit units to deal with the smart systems adopted within these institutions and their impact on performance, in (Iraqi Trade Bank, Al-Nahrain Islamic Bank) the study sample, The research was based on a basic hypothesis, that the challenges of artificial intelligence affect the





quality of internal audit, which is reflected in the performance of financial institutions. The research reached a number of conclusions, the most important of which are: Artificial intelligence technologies contribute to improving the quality and efficiency of internal audit by adapting to smart systems and understanding complex systems, which is reflected positively on the performance of financial institutions. The research recommended the need to train auditors on the use of artificial intelligence tools and encourage institutions to replace manual systems with computerized systems to improve oversight performance and enhance cooperation between information technology and internal audit teams to ensure effective integration that ensures the quality of internal audit, which is reflected in improved performance.

Keywords: challenges of artificial intelligence, quality of internal audit, performance of financial institutions.

Introduction:

In recent years, the world has witnessed rapid development in artificial intelligence technologies, which has led to a radical transformation in the working methods within financial institutions, especially in the field of internal auditing. Artificial intelligence has become an effective tool in analyzing big data, discovering patterns, and providing accurate insights that contribute to improving the quality of auditing. However, this digital transformation is accompanied by many challenges, such as limited human understanding of the mechanisms of algorithms, and difficulty interpreting their results. The lack of specialized competencies, which may affect the reliability of internal audit processes and raise questions about its impact on the performance of financial institutions. In this context, this study aims to shed light on the most prominent challenges facing financial institutions when employing artificial intelligence in internal audit, analyze the impact of these challenges on audit quality, and explore the relationship between internal audit quality and institutional performance. The study also seeks to provide practical recommendations that contribute to enhancing the readiness of institutions to adopt artificial intelligence effectively and safely, in order to achieve a balance between digital innovation and sound financial control.

1. First: the Methodology





1.1. Problem Study

With the rapid expansion of the use of artificial intelligence technologies in financial operations, institutions face multiple challenges related to the efficiency of these technologies and their compatibility with internal audit requirements. The need arises to study the impact of these challenges on the quality of internal audit and its impact on the performance of financial institutions, especially in an environment characterized by increasing complexity and digitization.

To what extent do AI challenges affect the quality of internal audit and how do these challenges affect the performance of financial institutions?

1.2. Hypotheses Study

The research is based on a main hypothesis: (Artificial intelligence challenges affect the quality of internal audit, which is reflected in the performance of financial institutions).

The following sub-hypotheses emerged from this hypothesis:

- 1- Artificial intelligence challenges negatively affect the quality of internal audit in terms of accuracy, compliance and efficiency, which is reflected in the performance of financial institutions.
- 2- Limited qualified human resources in the field of artificial intelligence lead to a decline in the quality of internal audit, which is reflected in the performance of financial institutions.

1.3. Importance Study

The importance of this study stems from the rapid digital transformation witnessed by the financial institutions sector, which has led to an increasing reliance on artificial intelligence technologies in various processes, including internal audit. Although these technologies provide opportunities to enhance efficiency and accuracy in reviewing financial statements, their use is accompanied by a set of technical and organizational challenges that may negatively affect the quality of internal audit. The importance of the study lies in its quest to analyze these challenges and evaluate their impact on audit quality and its impact on the performance of financial institutions in terms of effectiveness, transparency, and compliance with standards. The study also contributes to providing practical insights that help auditors and decision-makers develop effective strategies for employing artificial intelligence in a way that ensures achieving the highest levels of quality and reliability in



auditing, and enhances institutional performance in a complex and competitive financial environment.

1.4. Objectives Study

- 1- Study the impact of artificial intelligence challenges on the quality of internal auditing, and analyze its impact on the performance of financial institutions.
- 2- Analyzing the most prominent challenges of applying artificial intelligence in the field of internal audit within financial institutions.
- 3- Evaluating the extent to which these challenges affect the quality of audit processes, in terms of accuracy, efficiency, and compliance with standards.
- 4- Proposing mechanisms or solutions to overcome the challenges of artificial intelligence in a way that enhances the quality of internal audit and improves institutional performance.

1.5. Sample and Research Tools

The researchers used a questionnaire as a tool for this study and it was designed on a five-point Likert scale (completely agree, agree, neutral, disagree, completely disagree). Phrases were weighted from five (5) "completely agree" to one (1) "completely disagree" to ensure objective results. "A number of (70) questionnaire forms were distributed to a sample of accountants and auditors working in financial institutions, where the sample was divided equally between accountants (35 forms) and internal auditors (35 forms), to ensure balanced representation of the two categories." (55 forms) were retrieved, and the sample was intentionally selected from the banks in the study sample, with the aim of obtaining data that reflects the reality of the challenges associated with the use of artificial intelligence in the internal audit environment and its impact on the performance of financial institutions. It was analyzed using the statistical program (SPSS.26).

2. Second: Lecturer review

2.1. Kahit et al. study, 2024

Applications of artificial intelligence and their impact on achieving the quality of internal audit, an exploratory study in the Commercial Bank of Iraq, Babylon branch.





The study aimed to reveal the nature of the relationship between artificial intelligence applications and audit quality, as the financial and administrative development witnessed by all business activities led these institutions to seek ways of mechanisms that contribute to improving the oversight and evaluation process in their various departments. The study found limited reliance on artificial intelligence applications in the bank under study, which negatively affects the efficiency of the audit process. The research also presented a set of recommendations, the most important of which is that Iraqi institutions in general and the institution under study should rely more on artificial intelligence applications because of their importance in improving the quality of auditing.

2.2. Akasha and Boucheriba's study, 2024

The Impact of Using AI Technologies on the Internal Audit Function (Big Four Audit Companies Case Study)

This study aims to highlight the impact of the use of artificial intelligence technologies on the internal audit function. To achieve this goal, the descriptive analytical approach was relied upon to present the most important artificial intelligence technologies used in internal audit, as well as relying on the case study method of the four major audit companies Big Four, represented by "KPMG, Deloitte, PwC, EY". The results of the study show a positive impact resulting from the use of artificial intelligence technologies on the internal audit function of the four major audit companies, as each company relies on a set of technologies that suit the nature of its work. The study also recommends the need for companies to conduct training training for their employees in order to keep pace with current developments and learn the methods and techniques of using these technologies.

2.3. Vdog study, 2024:

(The role of the internal audit function in improving the financial performance of the organization a survey of a sample of professionals and academics). This study aimed to determine the role of the internal audit function in improving financial performance at the level of economic institutions by identifying the most important aspects of internal audit and financial performance and the nature of the relationship between them. For this purpose, the descriptive analytical approach was relied upon, with the questionnaire used as a tool to test the study hypotheses. To achieve this goal, 50 questionnaires were distributed to a group of professionals and academics





represented by internal auditors, accountants and university professors At the level of Bordj Bou Arreridj state. The study reached several results, the most important of which is that internal auditing has an effective role in improving financial performance by testing the impact relationship between internal auditing and financial performance. It was confirmed that internal auditing contributes to improving financial performance by monitoring, on the one hand, financial ratios (represented by liquidity ratios, activity ratios, return ratios, debt ratios, and market ratios) and, on the other hand, financial balance indicators.

What Distinguishes the Current Study from Previous Studies.

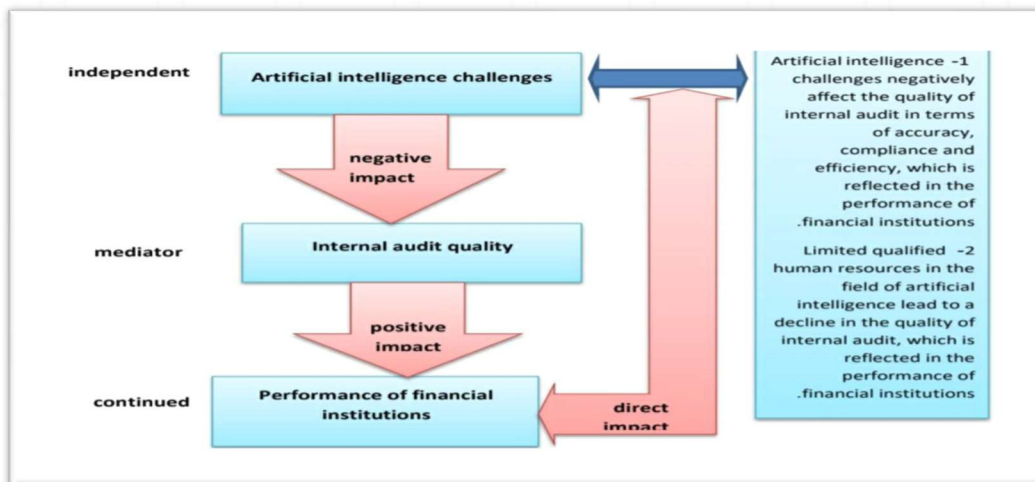
This study is distinguished from previous studies in that it is one of the studies that search for the challenges of artificial intelligence and its impact on the quality of internal auditing and its reflection on the performance of financial institutions, while previous studies dealt with revealing the nature of the relationship between artificial intelligence applications and the quality of auditing, as the financial and administrative development witnessed by all activities of business institutions led these institutions to seek ways of mechanisms that contribute to improving the oversight and evaluation process in their various departments Other studies have examined the impact of the use of artificial intelligence technologies on the internal audit function. To achieve this goal, the descriptive analytical approach was relied upon to present the most important artificial intelligence technologies used in internal audit, as well as the case study method of the four major audit companies Big Four, represented by "KPMG, Deloitte, PwC, EY". The results of the study show that there is a positive impact resulting from the use of artificial intelligence technologies on the internal audit function of the four major audit companies, as each company relies on a set of technologies that suit the nature of its work. Other studies dealt with the study of determining the role of the internal audit function in improving financial performance at the level of economic institutions by identifying the most important aspects of internal audit and financial performance and the nature of the relationship between them For this reason, the descriptive analytical approach was relied upon.

The hypothetical plan for the research Figure (1) shows the hypothetical plan for the research, which explains its basic features by explaining the relationship of correlation and influence between the research variables, as





shown below.



3. Third: Theoretical Side:

Theoretical framework of artificial intelligence: First research

3.1. The Concept of Artificial Intelligence

Artificial intelligence is defined as the use of innovative computer systems and machines that have the characteristics of the human mind, such as the ability to recognize images and data, solve problems, and learn (Cambridge Dictionary, 2024), and in the same direction the Oxford Reference defined it as.

The study and development of computer systems capable of replicating intelligent human behavior, such as understanding languages and making appropriate decisions (Oxford Learner's Dictionaries, 2024). Artificial intelligence is concerned with studying computer systems that rely on artificial intelligence and learning new concepts and tasks. It is possible to think, draw useful conclusions, absorb languages, visual observation, and perform work that requires human intelligence. Organizations that have adopted artificial intelligence techniques in internal auditing have witnessed a significant improvement in the quality of auditing. In terms of speed of completion and accuracy of results, this improvement was conditional on the institution's readiness in terms of infrastructure and training. Also, the weak reliance on these technologies in some institutions led to a decrease in audit efficiency, which negatively affected overall performance (Al-Ratimi, 2012).



3.2. Components of artificial intelligence.

Artificial intelligence consists of a set of components:

- A- The information base: This base includes data store information, analytical processing via Internet networks, and data modification, in addition to the operations of the integrated management information system that is concerned with users, preparing data for their inputs into the data store, and performing the necessary processing.
- B- User Interface The user interface is the main element for their computer-using patients, and consists of hardware and software. The design and shape of the interface affect the amount of effort expended by users to provide system inputs and interpret its outputs in a way that serves their patients.
- C- A search engine is a set of programs that work to clarify the type of information and data required and their locations in the information base, including new data and information through coordinated processing and analysis applications and strategies. (2004, Nedeva)

The theoretical framework of internal audit Research II.

1- The concept of internal audit

Internal audit is an independent evaluation function established within an organization to examine and evaluate its activities, aiming to:

To help individuals perform their responsibilities effectively, the modern concept of internal audit includes being an independent and evaluative activity within the organization and being an advisory function, in addition to extending its activity to all types of administrative control. Hence, we find that the function of internal audit is not limited to administrative control only, but includes accounting control and internal control. It is an advisory function more than an executive function. (Daghah, Annan, 2018), Internal audit is defined as the function of advice and is carried out with complete independence and objectivity, improving the management of the institution and helping to achieve objectives through the systems approach and evaluating and improving risk management, control procedures and management methods. (HAMINI ALLEL, 1990).

2- Quality of internal audit

A- The concept of internal audit quality.

Audit quality is the achievement of the highest level of accuracy and transparency in the audit work of financial statements, which enhances the confidence of the beneficiaries of this data in the audit process. It is a comprehensive evaluation process that aims to ensure the accuracy of financial





information and the effectiveness of internal controls within the institution. It is not limited to merely reviewing numbers, but includes analyzing circumstances, assessing risks, and verifying compliance with ethical and professional standards. Audit quality is defined as the amount of conformity with requirements Organizations are keen to strive to monitor daily business activities, in order to reach the highest level of audit work. (Ali, M. M., Abdullah, A. S., & Khattab, G. S. 2022)

B- Audit quality objectives.

- 1- Enhancing credibility and transparency in financial reports
- 2- Enabling decision makers to make informed choices
- 3- Reducing the possibility of distortion or fraud in financial statements.
- 4- Supporting employee safety by monitoring working conditions and analyzing risks.

The quality of internal audit is achieved through:

- 1- Commitment to professional standards such as independence, competence, and professional skepticism.
- 2- Use modern tools and techniques to improve risk assessment.
- 3- Enhancing communication between auditors and clients to ensure a common understanding of goals and challenges. (Hamad, Hamid, 2023).
- 4- Factors affecting the quality of internal audit.

The quality of internal audit does not depend only on technical skills, but is affected by a set of organizational, human, and technical factors that determine the effectiveness and efficiency of the process, The most prominent of these factors are:

- A- Qualifications and professional experience: The level of academic education of internal auditors, practical experience in the field of auditing and accounting, continuous training and professional development.
- B- Independence and impartiality: The extent of the internal audit unit's independence from executive management and the absence of conflicts of interest between auditors and the departments being audited.
- C- Senior management support: Senior management's attention to audit results and recommendations and providing adequate resources (financial, human, technical) to the audit unit.





- D- Planning and organization: Having a clear annual audit plan based on risk assessment, organizing work within the team, and distributing tasks effectively. (zureigat and moshageh, 2014)
- E- Use of technology: Employing modern tools and techniques in collecting and analyzing data, and automating some audit procedures to improve efficiency and reduce errors.
- F- Quality control: Having an internal system to review the quality of audit work and adhering to international standards such as IIA (International Institute of Internal Auditors) standards.
- G- Organizational environment and corporate culture: The extent of the organization's transparency, acceptance of auditing, and the culture of commitment and compliance within the organization. (Ali, M. M., Abdullah, A. S., & Khattab, G. S. 2022)

Research III: The impact of artificial intelligence challenges on the quality of internal audit and their impact on the performance of financial institutions.

1- Artificial intelligence and its applications in internal auditing

Artificial intelligence is defined as the ability of computer systems to simulate human behavior through learning, analysis, and decision-making. Its applications in the field of internal audit vary to include:

- A- Big data analysis: Intelligent systems can process huge amounts of financial and non-financial data quickly and accurately.
- B- Detecting abnormal patterns: which contributes to detecting possible manipulation or fraud.
- C- Automate routine procedures: such as reviewing invoices, verifying conformity, and generating audit reports.
- D- Risk prediction: through machine learning models capable of anticipating future threats. (Isaiah, O.A, Rufus, 2023)

2- Challenges of artificial intelligence in internal auditing

Despite the significant benefits, financial institutions face several challenges when applying artificial intelligence in internal auditing, including:

- A- Technical challenges: such as weak digital infrastructure and the lack of readiness of old systems to integrate with artificial intelligence technologies.
- B- Human challenges: related to the lack of specialized competencies and traditional auditors' limited understanding of modern technologies.





C- Ethical and regulatory challenges: These include issues of transparency in decision-making, privacy protection, and the absence of legislative frameworks regulating the use of artificial intelligence(Khelassi, 2010)

3- The impact of artificial intelligence on the quality of internal audit
Artificial intelligence contributes to enhancing the quality of internal auditing by:

- A- Raising the level of accuracy and reducing human errors.
- B- Accelerating audits and improving operational efficiency.
- C- Enhancing the ability to predict risks and make proactive decisions.

However, over-reliance on intelligent systems without human intervention may lead to the omission of some qualitative aspects that are difficult for the machine to evaluate. (Mpofu, F.2023)

4- The impact of audit quality on the performance of financial institutions
The quality of AI-powered internal auditing positively impacts the performance of financial institutions by:

- A- Improving operational efficiency: High-quality internal auditing helps detect waste and inefficient processes and contributes to improving workflow and better distributing resources, which is reflected in reducing costs and increasing productivity.
- B- Strengthening oversight and compliance: Good auditing ensures the institution's compliance with local and international financial laws and regulations, reduces the possibility of exposure to penalties and fines, and improves the institution's reputation before regulatory authorities.
- C- Reducing financial and administrative risks: It helps in early detection of errors, fraud, or mismanagement and allows the organization to take corrective measures before problems worsen, which protects its assets and enhances its financial stability. (Mullainath and Spiess, 2017))
- D- Supporting strategic decision-making: Internal audit provides accurate and reliable information to senior management and contributes to making decisions based on real data, which enhances thoughtful growth and expansion.
- E- Raising the level of confidence among investors and shareholders: The quality of the audit reflects the transparency and credibility of the institution and leads to increased investor confidence, which facilitates attracting capital and enhancing market value.
- F- Stimulating innovation and continuous improvement: Auditing is not limited to detecting errors, but rather contributes to proposing solutions and improvements and pushes the organization to adopt new





technologies such as artificial intelligence, which enhances its competitiveness. (Berk, 2008),

Fourth- Method and procedures.” - Analyzing the results of the study and testing the hypothesis

1- Description of the Respondents:

This section will present the results of the statistical analysis process of the study data, by detailing the characteristics of the study sample by extracting frequencies, percentages, and standard deviations and analyzing the study data, as well as presenting a test of the study hypotheses. Therefore, the section was divided into:

1- Characteristics of the study sample: Frequencies and percentages were extracted to describe the characteristics of the study sample, and the results were summarized as follows:

The characteristics of the demographic study sample, which include (gender, age, educational level, years of experience), are clarified by calculating frequencies and percentages, in a table as follows:

Table (1) Study Sample Characteristics

Sex	F	%
Male	40	(72.7)
Female	15	(27.3)
Total	55	(100)
Old	F	%
(40-30)	18	(32.7)
(50-41)	20	(36.4)
(51 and above)	17	(30.9)
Total	55	(100)
academic qualification	F	%
(Ph.D.)	3	(5.5)
(Master's degree)	5	(10.0)
(Bachelor's degree)	47	(85.0)
Total	55	(100)
number of years of experience	F	%
less than a year	4	(7.4)
(2 - 1)	6	(10.9)
(5 - 2)	9	(16.4)
(10 - 5)	20	(36.3)
(20 - 10)	16	(29.0)
Total	55	(100)

From Table (1) the following results become clear:



- 1- Gender variable: The majority of the study sample is male, at a rate of (72.7%), while the female category reached (27.3%). The researchers attribute the small percentage of females in the sample to their weak response to the study tool.
- 2- Age variable: The results of the study showed that the predominant age group of the sample was (36.4%) in the age group (41-50) years. We see that the largest percentage of the study sample is from the middle-aged category, and this is explained by the banks' interest in the human aspect, employment, and supporting the institution with qualified and experienced people. This category is also distinguished by its possession of many experiences and high capabilities.
- 3- Educational level variable: Regarding education levels, the results of the table show that the majority of the sample (85%) had a bachelor's degree, which means that most members of the study population have university levels and can achieve high levels of return by virtue of the nature of their work and being experienced.
- 4- Variable number of years of experience: (36.3%) of the study sample have more than (5-10) years of practical experience, while (7.4%) of them have less than (2) years of practical experience, which is the least frequent category. Researchers believe that this high experience of auditors and accountants in banks is considered a cornerstone of audit quality, and that they are more capable of working with flexibility and creativity.

Second "- descriptive analysis

The researchers used the five-point Likart scale to answer the questionnaire items based on the following values (agree - strongly agree – neutral – do not agree - strongly disagree), and the arithmetic averages and standard deviations of the study axes were found as follows:

Table (3) Summary statistics of the responses of the study sample members on (AI challenges negatively affect the quality of internal audit in terms of accuracy, compliance and efficiency, which is reflected in the performance of financial institutions).

Standard Deviation	Average	Paragraphs	Sequence
1.054	4.59	automation reduces the time it takes to review financial processes, increases productivity and contributes to speeding up audits.	1



1.135	3.77	the use of artificial intelligence requires access to sensitive databases, raising concerns about privacy and hacks.	2
1.185	3.75	artificial intelligence tools are being developed in a more transparent and interpretable manner, which is reflected in the performance of financial institutions.	3
1.236	3.85	auditors prefer traditional methods and show reservations about using artificial intelligence in their work, which is reflected in financial performance.	4
1.217	3.86	artificial intelligence technologies provide advanced analytical reports that help in making strategic decisions based on accurate indicators.	5
1.309	3.65	ai-powered auditing helps reduce operational risks.	6
1.235	4.77	artificial intelligence tools are able to analyze huge amounts of data quickly and efficiently, which enhances the quality of auditing and is reflected in the performance of financial institutions.	7
1.260	3.76	ai tools are integrated with existing audit systems in financial institutions.	8
1.204	3.625	ai challenges negatively impact the quality of internal audit in terms of accuracy, compliance, and efficiency, which impacts the performance of financial institutions.	Total

We note from Table No. (3) that paragraph No. (7) came in first place with an arithmetic mean (4.77) and a standard deviation (1.235). (Artificial intelligence tools are capable of analyzing huge amounts of data quickly and efficiently Which enhances the quality of auditing and is reflected in the performance of financial institutions) and in second place came paragraph No. (1) with an arithmetic mean (4.59) and a standard deviation (1.054), (Automation reduces the time spent reviewing financial operations, increases productivity and contributes to accelerating audit operations), in third place came paragraph No. (5) with an arithmetic mean (3.86) and a standard deviation (1.217), (Artificial intelligence technologies provide advanced analytical reports that help in making strategic decisions based on accurate indicators). In fourth place came paragraph No. (4) with an arithmetic mean (3.85) and a standard deviation (1.236)(Auditors prefer traditional methods and show reservations about using artificial intelligence in their work, which





is reflected in financial performance) and in fifth place came paragraph No. (2) with an arithmetic mean of (3.77) and a standard deviation of (1.135) (The use of artificial intelligence requires access to sensitive databases, Raising concerns about privacy and breaches) In sixth place came paragraph No. (8) with an arithmetic mean (3.76) and a standard deviation (1.260), (AI tools are integrated with existing audit systems in financial institutions) and in seventh place came paragraph No. (3) with an arithmetic mean (3.75) and a standard deviation (1.185), (Artificial intelligence tools are being developed in a more transparent and interpretable manner, which is reflected in the performance of financial institutions). Paragraph No. (6) came in eighth place with an arithmetic mean of (3.65) and a standard deviation of (1.309). (Audit supported by artificial intelligence contributes to reducing operational risks).

Table (4) The relationship between the comprehensive assessment of sample members and their demographic data.

Signal	P Value	Degree of Freedom	Chi-Square	Demographic Data
there is no relationship	.153	7	9.573	Age
there is no relationship	.435	3	1.640	sex
there is no relationship	.234	4	2.978	Educational level
there is no relationship	.183	2	6.389	Years of experience

Table (4) shows that there is no relationship between the overall evaluation of the sample's answers and their demographic data where the value of (p) is greater than (0.05).

Test (T) was used to compare the arithmetic mean of the dimension with the standard score (3), the criterion for accepting the hypothesis, as shown in Table (2).

Table (5) Arithmetic averages, standard deviations, and acceptance criterion (T) for paragraphs

statistical significance	Value:T	standard deviation	Arithmetic mean	AI challenges negatively impact the quality of internal audit in terms of accuracy, compliance, and efficiency
0, 000	102, 643	3.625	1.204	



It is clear from Table (5) that there are statistically significant differences ($\leq 0, 95$) between the arithmetic mean and the standard score (3), where the acceptance criterion reached (102, 643) and with a statistical significance (0.000). This means accepting this hypothesis, which states that the challenges of artificial intelligence affect the quality of internal audit in terms of accuracy, compliance and efficiency, which is reflected in the performance of financial institutions.

Table (6) Average sample answers about (Limited qualified human resources in the field of artificial intelligence lead to a decrease in the quality of internal audit, which is reflected in the performance of financial institutions).

standard deviation	average	Paragraphs	sequence
1.440	4.45	Weak technical infrastructure in financial institutions, as they lack integrated smart systems that support artificial intelligence applications.	9
1.098	3.72	Lack of qualified human competencies and the small number of internal auditors capable of dealing with artificial intelligence tools such as machine learning and big data analysis.	10
1.314	3.56	Limited institutional adoption, as some institutions still rely on traditional auditing methods, which limits the effectiveness of artificial intelligence, negatively impacting the performance of financial institutions.	11
1.191	3.62	The existence of sufficient training programs to enable auditors to understand and apply artificial intelligence techniques.	12
1.298	3.60	Financial institutions invest in digital infrastructure and train human resources	13
1.238	3.51	Financial institutions have qualified human resources and internal auditors capable of handling artificial intelligence tools.	14
1.064	4.76	Artificial intelligence technologies reduce human bias in regulatory decision-making and enhance transparency and neutrality.	15
1.181	3.87	Auditors have the technical skills necessary to use AI tools efficiently.	16
1.228	3.88	Limited qualified human resources in the field of artificial intelligence lead to a decline in the	Total





quality of internal audit, which is reflected in the performance of financial institutions

We note from Table No. (6) that paragraph No. (15) came in first place with an arithmetic mean (4.76) and a standard deviation (1.064), (that artificial intelligence technologies reduce human bias in making regulatory decisions, and enhance transparency and neutrality), In second place came paragraph No. (9) with an arithmetic mean (4.45) and a standard deviation (1.440) (weak technical infrastructure in financial institutions, as they lack integrated smart systems that support artificial intelligence applications), In third place came paragraph No. (16) with an arithmetic mean (3.87) and a standard deviation (1.181) (auditors possess the technical skills necessary to use artificial intelligence tools efficiently) In fourth place came paragraph No. (10) with an arithmetic mean of (3.72) and a standard deviation of (1.098) (lack of qualified human competencies and the small number of internal auditors capable of dealing with artificial intelligence tools such as machine learning and big data analysis) In fifth place came paragraph No. (12) with an arithmetic mean of (3.62) and a standard deviation of (1.191) (the existence of sufficient training programs to enable auditors to understand and apply artificial intelligence techniques), and in sixth place came paragraph No. (13) with an arithmetic mean of (3.60) and a standard deviation of (1.260), (Financial institutions invest in digital infrastructure and train human cadres.) In seventh place came paragraph No. (11) with an arithmetic mean of (3.56) and a standard deviation of (1.314), (limited institutional adoption as some institutions still rely on traditional methods of auditing, which limits the effectiveness of artificial intelligence, which negatively affects the performance of financial institutions) and in eighth place came paragraph No. (14) with an arithmetic mean of (3.51) and a standard deviation of (1.238), (Financial institutions have qualified human resources and internal auditors capable of handling artificial intelligence tools).

Table (7) The relationship between the comprehensive assessment of sample members and their demographic data.

Signal	P Value	Degree of Freedom	Chi-Square	Demographic Data
there is no relationship	.325	8	10.442	Age
there is no relationship	.481	4	2.426	sex
there is no relationship	.534	4	2.249	Educational level





there is no relationship	.361	7	6.479	Years of experience
--------------------------	------	---	-------	---------------------

Table (7) shows that there is no relationship between the overall evaluation of the sample's answers and their demographic data where the value of (p) is greater than (0.05).

Test (T) was used to compare the arithmetic mean of the dimension with the standard score (3), the criterion for accepting the hypothesis, as shown in Table (5).

Table (8) Arithmetic averages, standard deviations, and acceptance criterion (T) for paragraphs.

statistical significance	Value:T	standard deviation	arithmetic mean	On the limited number of qualified human resources in the field of artificial intelligence leads to a decline in the quality of internal audit
0, 000	105.827	3.88	1.228	

It is clear from Table (8) that there are statistically significant differences ($\leq 0, 95$) between the arithmetic mean and the standard score (3), as the basement standard reached (105, 827) and in statistical terms (0.000). This means accepting the hypothesis that states that the limited qualified human resources in the field of artificial intelligence lead to a decrease in the quality of internal audit, which is reflected in the performance of financial institutions.

Conclusions

The researchers reached a number of results, the most important of which are:

- 1- The results showed that artificial intelligence tools are capable of analyzing huge amounts of data quickly and efficiently, which enhances the quality of auditing and is reflected in the performance of financial institutions.
- 2- The results showed that automation reduces the time spent reviewing financial processes, increases productivity and contributes to accelerating audit processes.
- 3- It has been shown that artificial intelligence technologies reduce human bias in making regulatory decisions and enhance transparency and neutrality.



- 4- The results showed that artificial intelligence technologies provide advanced analytical reports that help in making strategic decisions based on accurate indicators.
- 5- The results showed the weakness of the technical infrastructure in financial institutions, as they lack integrated smart systems that support artificial intelligence applications.
- 6- There is a lack of qualified human competencies and a small number of internal auditors capable of dealing with artificial intelligence tools such as machine learning and big data analysis.
- 7- The use of artificial intelligence requires access to sensitive databases, which raises concerns about privacy and breaches.
- 8- Limited institutional adoption, as some institutions still rely on traditional auditing methods, which limits the effectiveness of artificial intelligence, which negatively impacts the performance of financial institutions.

Recommendations

Based on the results, the researchers reached some recommendations, including:

- 1- The necessity of relying on artificial intelligence tools to analyze data quickly and efficiently, which enhances the quality of auditing and is reflected in the performance of financial institutions.
- 2- The necessity of investing in digital infrastructure and training human cadres.
- 3- Adopting clear policies to regulate the use of artificial intelligence in internal auditing to improve the performance of financial institutions.
- 4- Enhancing confidence in artificial intelligence results by integrating them with human professional judgment.
- 5- The need to develop more transparent and interpretable artificial intelligence tools.
- 6- Qualified human competencies should be employed and the number of internal auditors capable of dealing with artificial intelligence tools should be increased.
- 7- Adequate training programs should be provided to enable auditors to understand and apply artificial intelligence techniques in financial institutions

References:





- [1] Ahmed Abdel Hassan Kahit, Ali Muhammad Hussein, & Muhammad Saadi Kazem. (2024). Applications of artificial intelligence and their impact on achieving the quality of internal audit: An exploratory study in the Commercial Bank of Iraq, Babylon Branch. *Iraqi Journal of Economic Sciences*, 22(80).
- [2] Al-Ratimi. (2012). Artificial intelligence and expert systems. Retrieved from <http://www.artemi.info/>
- [3] Ali Muhammad Mustafa, Abdullah Ahmed Salih, & Khattab Ghassan Salih. (2022). The effect of activating artificial intelligence techniques on enhancing internal auditing activities: A field study. *Alexandria Journal of Accounting Research*, 6(3), 1–40.
- [4] Berk, Richard A. (2008). *Statistical learning from a regression perspective* (Vol. 14). Springer.
- [5] Cambridge Dictionary. (2024). Artificial intelligence. Retrieved January 20, 2024, from <https://dictionary.cambridge.org/dictionary/english/artificial-intelligence>
- [6] Daghat, Iman, & Anan, Rahma. (2018). The role of internal audit in activating the internal control system (Master's memorandum). University of Ouargla.
- [7] Hamad, Hamid. (2023). Improving the quality of internal audit according to the environmental component of the efficiency framework issued by the Institute of Internal Auditors. *Journal of Management and Economics*, 48(139).
- [8] Hamini, Allel. (1990). *Le contrôle interne et l'élaboration du bilan comptable*. Alger: Office des Publications Universitaires.
- [9] Hussain. (2018). Artificial intelligence and its applications. *International Research Journal of Engineering and Technology (IRJET)*.
- [10] Isaiah, Olufemi Adebayo, Rufus, Ibrahim Adekunle, Theophilus, Adewale Adesina, & Olubusola, Adeyemi Oladipo. (2023). Artificial intelligence and audit quality: Implications for practicing accountants. *Asian Economic and Financial Review*, 13(11), 757.
- [11] Jamil, Othman. (2015). The possibility of using artificial intelligence technologies in internal audit quality control: A field study of Jordanian public joint stock companies. *Jordanian University Journal*.
- [12] Khelassi, Rachid. (2010). *Les applications de l'audit interne*. Algérie: Homa Édition.
- [13] Mpofo, Fortune. (2023). The application of artificial intelligence in





external auditing and its implications on audit quality: A review of the ongoing debates. *Journal of Research in Business & Social Science*, 12(9), 500.

- [14] Mullainathan, Sendhil, & Spiess, Jann. (2017). Machine learning: An applied econometric approach. *Journal of Economic Perspectives*, 21(2), 87–106.
- [15] Nedeva. (2004). Concept of an integrated marketing information system. *Trakia Journal of Sciences*, 2(4), 17–21.
- [16] Okasha, Hayat, & Bouchriba, Muhammad. (2024). The impact of the use of artificial intelligence technologies on the internal audit function: Case study of the Big Four audit firms. *Journal of Studies in Economics and Business Administration*, 7(1).
- [17] Oxford Learner's Dictionaries. (2024). Artificial intelligence. Retrieved January 20, 2024, from <https://www.oxfordlearnersdictionaries.com/definition/english/artificial-intelligence>
- [18] VDJ, Manal. (2024). The role of the internal audit function in improving the financial performance of the institution: A survey of a sample of professionals and academics. Mohamed Bashir Brahimi University, Bordj Bou Arreridj, Faculty of Economic, Commercial and Management Sciences, Algeria.
- [19] Zureigat, Qasem Mohammad, & Al-Moshaigeh, Abdulrahman. (2004). Measuring the performance of internal audit function in Saudi listed companies: An empirical study. *International Business Research*, 7(7), 72.

