



Article

The Role of Artificial Intelligence in Accelerating Internal Audit Processes

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Abstract: This paper shows how artificial intelligence (AI) is changing internal audit functions by improving both quality and quantity in auditing all over the world. With the pace at which organizations are adopting AI since its arrival, internal auditing has also gone ahead to improve data analysis, risk identification, compliance tracking, and process optimization by the use of artificial intelligence. This research specifically focuses on error detection and streamlining audit procedures with AI, and on the integration of artificial intelligence with existing audit frameworks. Data for this research were collected through a questionnaire whose responses were analysed using SPSS software. The results showed that artificial intelligence significantly sped up internal audit processes; besides, findings also revealed the existence of an evident association between the use of AI and reduced audit preparation time, as well as that on AI adoption-and enhanced management of risks related to accounting operations.

Keywords: : Artificial Intelligence, Internal Audit, Risk Management.

1. Introduction

In the current fast-altering business environment, organizations face the dual issues of managing the growing volume of data and the increasing complexity of accounting systems [1], [2]. These challenges precipitated the adoption of advanced tools and technologies aimed at enhancing the efficiency and effectiveness of the audit and review functions. AI has, in this context, emerged as a technological innovation worthy of fundamentally changing internal audit work by enhancing the speed and precision with which data is analyzed, risks are detected, and decisions are made [3].

2. Materials and Methods

Research Problem

The research problem of this thesis is how to hasten internal auditing in Iraqi companies with the application of artificial intelligence methods. These companies' internal auditing has been confronted with many challenges regarding efficiency and speed related to the detection of errors and risks due to the enormous increase in the volume of data as well as the complexity associated with financial and regulatory processes. Accordingly, this study seeks to explore the contribution of artificial intelligence in accelerating the internal auditing process.

The goal of the research

To augment internal audits through speed, improvement, cost-effectiveness, and accuracy, artificial intelligence must execute an investigation against data at high rates

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and then analyze data and risks deeply, quickly, and intensively. With the processing and analysis of real-time data, artificial intelligence can produce completely correct and speedy reports.

Importance of research

AI can perform many of the mundane tasks and transformation of internal auditing such as big data analysis, thus saving time and minimizing human errors. Through techniques such as machine learning, AI can herald the future and assess risk: high-risk areas can be detected early, allowing for corrective measures to be taken beforehand.

The search limits

- a. Time Limits: This research will be conducted in 2025.
- b. Spatial Limits: This research will be applied to government institutions (accountants, auditors, and employees of the Southern Refineries Company and the Southern Oil Company).

Research Hypotheses

- a. Artificial intelligence marks a statistically significant positive value in accelerating internal audit processes across organizations.
- b. There is statistically significant correlation in the use of AI technology and time needs in internal audit completion.
- c. There exists a statistically significant relation between the use of artificial intelligence in internal audits and effectiveness in the management of risks relating to accounting processes.

Previous studies

1. Study (How Technology is Shaping Internal Auditing Association, 2015). This study aimed to highlight the potential of using information technology to increase the efficiency and effectiveness of auditing, as information technology continues to integrate into business processes and daily activities, while not neglecting the risks associated with its use. It demonstrated that technology has indeed become an integral part of internal audit activities and processes. This will help internal auditors discover areas where they can develop their professional performance, which will lead to increased value for the organizations in which they work.
2. The study conducted by Abu Bakr Abdullah "The Role of Artificial Intelligence in Improving Quality of Internal Auditing" wanted to clarify the role of artificial intelligence (AI) as a modern technological tool to enhance the performances and quality of internal auditing. The study examines different concepts of the AI system and their applications focusing on auditing, showing their importance in the area of auditing. The study further showed how the integration of AI in the planning and execution of internal audit work can uplift the overall quality of auditing.
3. Essems Al-Samarrai and Nadia Abdul Jabbar Al-Shuraida studied "The Role of Artificial Intelligence Technologies Using Digital Auditing in Achieving Audit Quality and Supporting its Strategy from the Perspective of Auditors." The research detailed the role played by AI technologies particularly within the digital auditing perspective in enhancing audit quality and providing support for audit strategies. The study also stressed the need for digital auditing tools in meeting these objectives. A questionnaire was distributed to 85 auditors in 17 audit firms in the Kingdom of Bahrain, and the data were analyzed through descriptive and analytical methods.
4. Amrush Ibrahim, "The Role of AI Technologies in Reducing Audit Risks: An Exploratory Study of Accounting Experts and Auditors". The objective of the work was to examine the ability of AI technologies to assist in reducing audit risk in the auditing environment, namely detection risk, inherent risk, and control risk. The research population was a professional sample consisting of 73 accounting experts and auditors. The works comprise a theoretical review of the relevant literature and a

field-based study where a structured questionnaire was used to gather primary data for analysis.

5. Study by Khaldi Sara and Ziani Abdelhak, "The Role of AI Technologies in Improving Audit Quality." This study attempted to assess the role of AI technologies in improving auditing practice. It provided the conceptual bases of AI, identified key applications of AI, and examined how these technologies are contributing to the progressive changes of audit work. The study also looked into the relationship between AI use and the overall effectiveness and efficiency of the auditing profession.

3. Results and Discussion

Theoretical side

First topic: Artificial Intelligence

Artificial intelligence is one of the most widely used terms in the technology field in recent years [4]. It is credited with enabling many innovations and developments that were once mere dreams to become tangible reality. Artificial intelligence has penetrated all fields and aspects of business to the point that it has become a part of our daily lives [5].

The Concept of Artificial Intelligence

The science that studies and develops computational systems that can replicate human cognitive functions such as learning and understanding, problem-solving in decision making, correspondence to creativity, and performing tasks independently is considered AI

It can be defined as a set of different technologies that work together to simulate the human mind [6]. These technologies are used to enable machines to feel, understand, and act at human-like levels of intelligence

Artificial intelligence is defined as the ability of a machine to simulate the human mind and its workings, such as its ability to think and explore. With the tremendous development of computers, it has become clear that they can perform tasks more complex than we previously thought, such that they can explore and prove complex mathematical theories [7], [8]. They are characterized by their speed and accuracy in completing tasks. It has a large storage capacity, but to date, there is no program that can keep up with the flexibility of the human mind, especially with regard to the analytical deductive tasks it faces

Characteristics of Artificial Intelligence

The characteristics of artificial intelligence are as follows:

1. It uses a comparative approach to the human approach to solving complex problems.
2. It handles hypotheses simultaneously, accurately, and quickly.
3. It offers specific options for individual problems and groups facing similar problems.
4. It keeps a constant reliable standard, both in scientific and advisory performance.
5. Its development relies on representing large bodies of knowledge in a certain domain.
6. It handles symbolic and non-numerical data by means of logical reasoning and comparative analysis.
7. Its ultimate aim may be to imitate human thought processes and methods.
8. It stimulates new ideas that lead to innovation.
9. It perpetuates human expertise.
10. It provides multiple versions of the system to replace experts.
11. It eliminates feelings of fatigue and boredom.
12. It reduces reliance on human experts.

Drivers of AI Adoption

Three primary factors have been pivotal in the rapid development of AI across domains:

The first factor is that high-performance computing (HPC) has become comparatively inexpensive. Prior to this commercialization, only very few companies had the resources for high-power computing. With the advent of cloud technology, organizations can now use these powerful computing resources without the high costs that previously were associated with simply building out an infrastructure through an on-premises, non-cloud model. Therefore, it was this easy accessibility that began propelling the AI fast [9].

The second is the availability of larger amounts of data, which has facilitated AI learning. For an AI system to provide accurate predictions, it requires a fairly huge dataset to be fed into it for training purposes. The benefit today is that labeling, storing, and processing of both structured and unstructured data—merely at a small cost—have made it even easier to model AI and enhance algorithm performance [10].

Third, applied AI provides definite competitive advantages. Companies are waking up now to the strategic importance of AI-powered insights for ever more extending their decision-making processes and realizing corporate goals. For instance, AI-fueled personalized recommendations would ensure that new decisions are made faster and are supported by more and better evidence. AI cuts cost, manages risks, accelerates product development, and overall enhances operational efficiencies

Second Requirement: Internal Audit

The Concept of Internal Audit

Internal auditing has been defined as "an independent, objective, consultative, and assurance activity designed to add value to an organization and improve its operations. Internal auditing assists an organization through a systematic approach to assessing and improving the effectiveness of control processes, risk management, and governance practices."

Internal auditing performs a key function within an organization's internal control system. It is carried out with independence by qualified personnel of the company and serves as a very important tool for management. Internally, audit processes secure the implementation of administrative policies, protection of assets, and correctness of financial records and accounting data [11]. Ultimately, the internal audit function is designed to promote efficient operations and good organizational performance

Internal auditing has also been defined as an independent administrative function that includes the continuous and critical evaluation of an organization's operations in order to propose improvements and enhance and strengthen the organization's overall management mechanism, including the organization's strategic risk management and internal control systems [12], [13].

Internal Audit Objectives

Besides ensuring the organization's overall objectives, internal auditors concentrate on several specific objectives:

1. Assess and evaluate internal control systems' efficiency.
2. Check compliance with established policies and procedures by staff.
3. Safeguard organization assets.
4. Prevent and detect fraud and error internally.
5. Evaluate the reliability of on financial reporting and accounting systems to ensure they truthfully represent the organization.
 - a. Perform different audits on organizational operations, regularly or adhocarily , providing reports in full with findings and recommendations to senior management.
 - b. Assess the organization's compliance with legal and social regulatory requirements.
 - c. Assess staff performance within the organization.

- d. Liaise with the external auditor to determine those areas of the company to be audited externally.
- e. Currying applications for cost reduction and establishing measures for them.⁹

Steps of the Internal Audit Process

The internal auditing process consists of several steps:

1. Audit Planning: Conceptualization of a plan specifying objectives, systems, and risks.
2. Audit Implementation: The second, very much bigger part, includes a review of record keeping and processes, data collection, and data analysis.
3. Preparation of the Audit Report: Presentation of findings and recommendations, preparation of financial reports.
4. Monitoring of Recommendations: Ensuring the successful execution of recommendations

Topic Three:

Artificial Intelligence in the Future of Internal Audit Enhancement

AI technologies help considerably reduce the exposure of internal auditors to certain risks, such as giving an incorrect opinion or ignoring significant errors in the audit system or financial statements; such risks arise when a very small sample of data is examined. What sets AI apart is that it can quickly analyze an entire population or dataset regardless of size, providing the internal auditors with the opportunity to identify unusual or suspicious transactions that may be overlooked when traditional sampling techniques are applied [14]. Another benefit of AI is increasing audit efficiency. It provides the audit function with increased assurance at less time and effort. For example, something like a contract review that took hours can now be done almost instantaneously with the help of AI. Thus it allows auditors to focus on more critical and complex areas.

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

Auditors are affected by artificial intelligence in two different ways. On the one hand, auditors are affected by all the changes occurring in their clients' environment. Clients' adoption of new, innovative technologies is likely to transform all stages of auditing, from the planning phase of the audit project, through fieldwork, to the reporting of audit findings. On the other hand, auditors are directly impacted by the need to adopt artificial intelligence technologies to enable them to perform their work in line with client expectations, keep pace with developments, and improve the quality and accuracy of their services [15].

Increasing client expectations act as catalysts for auditors, further facilitating the work as the business grows and newer risks materialize. However, this is not the only factor influencing the audit profession's embrace of AI technology. Besides meeting their stakeholders' and clients' expectations, the survival of the audit profession will depend on its ability to adapt to and incorporate such changes, chiefly those imparted by technology.

Uses of Artificial Intelligence in Risk Management

AI can assist in risk management and assessment in a number of ways. For instance, machine learning can assist with data analysis to identify patterns and trends suggesting risks to the business. It can also provide predictive models to identify possible risks and strategize their mitigation. AI is used to develop early warning systems by analyzing information and data coming from various sources, including sensors, cameras, and other devices. This data is then analyzed using AI techniques like machine learning and neural networks to identify patterns and features that indicate a possible risk or hazard. For instance, an AI-based early warning system could track sensor data to sense certain deviant patterns that can indicate a fire or even explosion. Furthermore, artificial intelligence may be enhanced to better predict natural disasters, such as earthquakes or floods, thus allowing quicker response time and less damage. AI can provide an improvement in the efficiency and accuracy of an early warning system thus protecting

people and properties. Also, AI can be utilized in setting up early warning systems to send alerts on potential hazards and take appropriate preventive measures. The AI techniques may also be useful in optimizing the risk assessment and classification methodology, analyzing exposure scenarios. To put this nicely, artificial intelligence can take risk management to the next level by making risk assessment more accurate and by effectively assisting strategic decision-making.

Challenges to the Use of Artificial Intelligence in Auditing

Auditors are laboring under some constant challenges in the effective and best integration of artificial intelligence with their work, which increases through continuous advancements and evolution of technology. Some of these contending challenges include:

1. The design of AI software specific to auditing is complicated because data is usually very diverse and intricate. Auditors deal with various forms and specifics of data/information types, which makes it impossible to merge all these sources into a unified model for AI. Audit systems need to incorporate these technologies while maintaining the importance of human auditors.
2. It is also significant for auditing people to have acquired requisite skills to apply relevant AI techniques and keep pace with quick technological changes. The auditors should also understand and extract meaning from AI-generated audit conclusions and explain them easily to others. Transparency and the explainability of AI outcomes will be important but quite often difficult to obtain.
3. Ensure the cybersecurity of high-quality data and information for audited entities as well as for supreme audit institutions. AI models rely heavily on high-quality, consistent data to make accurate decisions. Ensuring data integrity is challenging, as inaccurate input data can lead to flawed audit results.

Field Study and Hypothesis Testing

Introduction.

Statistical Analysis of Demographic Factors.

Descriptive Statistical Analysis of Study Variables.

Testing of Study Hypotheses.

Introduction:

Following this overview of the demographic variables, which include job title, educational qualification, and experience, the study will discuss the hypotheses by using some selected statistical tests, including measures of central tendency, dispersion, association, chi-square tests, coefficient of determination, as well as simple and multiple regression models, which would help in testing other important statistical parameters). This section also includes the statistical aspect, represented by examining the research tool and selecting data from a practical perspective for the purpose of presenting, analyzing, and interpreting the results of the cause-and-effect analysis diagram. Then, it tests the hypotheses of influence between the research variables. This is done using the SPSS and Views statistical analysis software and a questionnaire using a five-point Likert scale for measurement and analysis.

After applying the coding procedure based on the five-point Likert scale (to be elaborated later), the next step would be to assess study variables in terms of significance and to ascertain whether the data accurately constitute a representation of the phenomenon being investigated.

Survey participants' response measures

To assess the responses of the sample under study to the main items of the survey tool, several central statistical parameters such as the arithmetic mean, standard deviation, percentage, and response trends were used. This is generally explained as follows:

1. Mean: This is the average level of agreement or disagreement of participants with each item, indicating whether responses were tending toward high values or low values.

2. Standard Deviation: This indicates the extent of variability in participants' responses concerning the mean. Whereas a smaller standard deviation would mean responses were closely clustered around the mean, a greater value would signify a higher spread of responses.
3. Range Calculation: For the five-point Likert scale, the range is the difference between the highest and lowest values ($5-1=4$).
4. Cell Length: The range is then divided by the number of scale points to get the length for each category of response ($4 \div 5 = 0.80$).
5. Determining Scale Intervals: The first response category is determined from the lowest number (1) by adding the cell length successively for the boundaries of each response category, leading to the following classifications:
 - a. A mean between 1.00 and 1.79 would identify with the designation "Strongly Agree".
 - b. A mean between 1.80 and 2.59 would identify with the designation "Agree".
 - c. A mean between 2.60 and 3.39 would identify with the designation "Neutral".
 - d. A mean between 3.40 and 4.19 would identify with the designation "Disagree".
 - e. A mean between 4.20 and 5.00 would identify with the designation "Strongly Disagree".

These intervals are summarized in Table 1.

Field Study Tool

This survey will form its core tool for data collection in order to direct the study towards achieving its objectives and testing its hypotheses through the opinions of employees in government departments elicited through a questionnaire. This questionnaire is designed with clear structured questions relating to the topic of the study (...), and respondents were required to respond by means of selecting answers from a range of choices within the questionnaire.

The questionnaire consists of 16 questions that are divided into three sections. The first section has general information which includes three questions regarding personal data (job title, degree, and number of years of experience).

The second section deals with five questions relating to the use of artificial intelligence in internal auditing.

The third section focused on the impact of artificial intelligence in accelerating internal auditing processes; this section consisted of eight questions.

The scale by which the responses were measured comprised five classes of a Likert-type scale. There were five options: strongly agree, agree, neutral, disagree, and strongly disagree. The scores on this scale were classified as follows:

Table 1. Scale for answering the question paragraphs

Classification	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
degree	1	2	3	4	5

The range of the five-point scale used in the study was calculated as follows:

$$\text{Range} = (5 - 1) / 5 = 0.80$$

1. 1.00 to 1.80 represents strongly agree
2. 1.80 to 2.60 represents agree
3. 2.60 to 3.40 represents neutral
4. 3.40 to 4.20 represents disagree
5. 4.20 to 5.00 represents strongly disagree

Testing and distribution of questionnaires

Before the researcher approved the questionnaire and its questions, it was necessary to test the validity and reliability of the questionnaire.

1. Testing the Validity of the Scale

To test the validity of the questionnaire, the questionnaire designated for field research was presented to professors and specialized experts to obtain their opinions on

the clarity and coherence of the questionnaire's paragraphs, the quality of the questions, and their compatibility with the study topic.

After the initial draft of the questionnaire was prepared, it was submitted to the referees for review.

The researcher followed their guidance in form and content to align with the study's objectives and hypotheses.

Through analysis of the Cronbach's alpha test for the validity and reliability of the questionnaire, it was found that its value was (0.711), which is greater than (0.6), which is consistent with the research objectives and also agrees with the referees' opinions, see Table 2.

Table 2. Represents the reliability measure (Cronbach's Alpha)

Cronbach's Alph	N of item
0.711	16

2. Survey Questionnaire Reliability Measurement

The pilot test with 20 randomly picked respondents from the government departments involved in the survey served to verify reliability. Initially, 20 pilot questionnaires were given to these participants. After one week, the same number of questionnaires was redistributed to the same group in order to assess response consistency. The Spearman's correlation coefficient for responses in the first and second rounds was compared, yielding 0.73 strong correlation. This indicates a very high level of consistency in the people's answers across both days of administration, thereby confirming reliability for the questionnaire, see Table 3.

Table 3. Represents the stability measurement of the survey form

Sample size before	Sample size after	Spearman's correlation coefficient	Morale level
20	20	0.73	0.082

3. Statistical analysis of demographic factors.

b. What is the job title

Table 4. Description of the research sample by job title

Variables	Target sample	Repetition	Ratio
What is the job title	Internal audit manager	6	12
	Auditor	16	32
	Financial manager	4	8
	Accountant	12	24
	IT officer	9	18
	Other	3	6
	The total	50	%100

The table 4 above clearly shows the distribution of the study sample members by job title as follows: (Auditor) was ranked first with a percentage of (32%), followed by (Accountant) in second place with a percentage of (24%), then (Information Technology Officer) in third place with a percentage of (18%), then (Internal Audit Manager) with a percentage of (12%), then (Financial Manager) with a percentage of (8%), and finally (Other) with a percentage of (6%).

2. Certificate

Table 5. Description of the research sample according to the certificate variable

Variables	Target sample	Repetition	Ratio
Certificate	Diploma	16	32
	Bachelor's	31	62
	Master's	3	6
	The total	50	% 100

As per the details given in the above table, educational qualification-wise distribution is provided for members of the study sample. The order of members is as follows: Bachelor's holders ranked first with 62% of the sample. Diploma holders ranked second with 32%. Master holders were just 6% of the sample, see Table 5.

3. How many years of experience

Table 6. Description of the research sample based on the variable of years of service

Variables	Target sample	repetition	ratio
Years of service	Less than 5 years	15	30
	5—20	17	34
	More than 20 years	18	36
	the total	50	% 100

The table 6 shown above clarifies that the percentage of study sample members according to years of practical service is: (More than 20 years) first with a (36%) score, (5-20) years the second with (34%) score, and at last (less than 5 years) is 30%.

Descriptive statistical analysis of the study variables.

In this section of the paper, a detailed account of the statistical analysis done in the study is presented. It is inclusive of the computation of various statistical indicators for the independent and dependent variables. The list of such indicators includes arithmetic mean, standard deviation, variance, correlation coefficient, chisquare, coefficient of determination, simple regression model, multiple regression model, and any other relevant statistical measure.

1. Descriptive statistics for (using Artificial Intelligence in internal auditing)

Table 7 shows the descriptive statistics represented by arithmetic means, standard deviations, relative importance of each item, and the order of importance, as in the following table:

Table 7. Sample items' responses to (the use of artificial intelligence in internal auditing)

Paragraphs	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Sample size	Arithmetic mean	Standard deviation	Relative efficiency	Sample orientation
Provides high-performance computing capabilities easily and affordably	18	21	8	2	1	50	1.94	0.93481	48.2	agree

Your organization relies on AI tools for internal audit processes.	8	21	12	8	1	50	2.46	1.01439	41.2	agree
Artificial intelligence is used to improve the detection of financial and administrative errors.	17	24	5	4	0	50	1.92	0.87691	45.7	agree
Modern and smart tools are used for the internal audit process.	12	28	6	4	0	50	2.04	0.83201	40.8	agree
There are large amounts of data available for learning.	23	24	3	0	0	50	1.6	0.60609	37.9	agree
0						50	1.992	0.68089	34.2	agree

The results of the statistical analysis presented in Table 7 reveal the following views regarding the presence of artificial intelligence in internal auditing:

1. The first item ("The availability of high-performance computing at affordable prices") ranked first in relative importance, with 48.2%, a mean response of 1.9400, and a standard deviation of 0.93481.
2. Next came third item "Using artificial intelligence for the improved detection of financial and administrative errors" with relative importance equal to 45.7%, mean 1.9200, and standard deviation 0.87691.
3. The second item: "Your organization relies on artificial intelligence tools in internal auditing processes" - this was ranked third, with 41.2% relative importance, mean of 2.4600, and a standard deviation of 1.01439.
4. Followed closely in fourth would be item four: "Modern and smart tools are used in the internal audit process", which had 40.8% relative importance, a mean of 2.0400, and a standard deviation of 0.83201.
5. The last in rank was the fifth item "The availability of large volumes of data for learning", with 37.9% relative importance, a mean of 1.6000, and a standard deviation of 0.60609.

These results reflect a variation in the perceived importance and effectiveness of different AI-related factors in internal auditing.

2. Descriptive Analysis of the Impact of Artificial Intelligence on the Acceleration of Internal Audit Processes.

Table 8. shows the descriptive statistics represented by arithmetic means, standard deviations, relative importance of each item, and the order of importance, as shown in the following table:

Table 8. Sample items' responses to (the impact of artificial intelligence on accelerating internal audit processes)

Paragraphs	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Sample size	Arithmetic mean	Standard deviation	Relative efficiency	Sample orientation
Artificial intelligence helps accelerate the detection of financial errors and irregularities.	19	21	8	2	1	50	1.94	0.93481	48.2	agree
Artificial intelligence helps reduce review process time.	17	26	7	0	0	50	1.8	0.6701	37.2	strongly agree
Artificial intelligence contributes to increasing the reliability of audit reports.	21	21	8	0	0	50	1.74	0.72309	41.6	strongly agree
Artificial intelligence will be more integrated into internal auditing in the future.	24	15	9	2	0	50	1.78	0.88733	49.9	strongly agree
Artificial intelligence helps in accurate data collection and analysis.	20	21	8	1	0	50	1.8	0.7825	43.5	strongly agree
Using advanced programming languages to speed up internal audit processes.	25	24	1	0	0	50	1.42	0.4986	35.1	strongly agree
Getting used to using smart programs to develop internal audit processes.	31	13	4	2	0	50	1.54	0.8134	52.8	strongly agree
The use of modern technological and computer equipment and devices contributes to the development and acceleration of internal audit processes.	34	5	6	5	0	50	1.64	1.0451	63.7	strongly agree

0						50	1.705	0.6368	37.3	strongly agree
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The statistical analysis results summarized in Table 8 bring out the following conclusions drawn from the researches on the influence of artificial intelligence in speeding internal audit processes:

1. The eighth item ranked the first-leading parameter of relative importance at the value of 63.7%, a mean of 1.6400, and a standard deviation of 0.45111, stated as "Modern technological and computing devices are important in the development and acceleration of internal audit processes."
2. The second-ranked item was number seven: "Regular use of smart programs contributes to the development of internal audit processes" of 52.8% relative importance, a mean of 1.5400, and a standard deviation of 0.81341.
3. The fourth item that involves the statement, "Artificial intelligence will be increasingly integrated into internal auditing in the future" was ranked third, with 49.9% relative importance, a mean of 1.7800, and a standard deviation of 0.88733.
4. The Item number one "Artificial intelligence contributes to accelerate financial error and violations detection" was ranked fourth with 46.9%, a mean of 1.9200, and a standard deviation of 0.89989.
5. Fifth is the Item number five "Artificial Intelligence is helping to improve the accuracy of data collection and analysis" which follows in the fifth rank with a relative importance of 43.5%, mean of 1.8000 and standard deviation of 0.78246.
6. The third item "Artificial intelligence enhances the reliability of audit reports" came in the sixth place with 41.6% relative importance, with mean 1.7400 and standard deviation 0.72309.
7. The second item "Artificial Intelligence was able to shorten the time required for audit procedures", placed in seventh place, with a relative importance of 37.2%, a mean of 1.8000, and a standard deviation of 0.67006.
8. Last is item number six "The use of advanced programming languages contributes to speeding up internal audit procedures" with a relative importance of 35.1%, mean 1.4200, and standard deviation 0.49857.

These results show that respondents expressed different perceptions regarding many aspects of artificial intelligence and its contribution to speeding up internal audit processes.

Statistical tests of the research hypotheses:

1. **The first hypothesis:** The proposition within the research hypotheses posited null hypothesis: there exists a statistically significant positive effect of artificial intelligence on the acceleration of internal audit processes within institutions.

To test this central hypothesis, regression analysis was performed, in addition to a summary of variance (ANOVA) table shown below:

Tables 9. Represent the t-test and the simple linear regression model.

Model variables	Parameter value	Standard deviation	Test	Morale level
			T	
Fixed limit	1.36	0.054	5.376	0.036
X	0.673	0.088	6.782	0.041

$$Y_i = 1.36 + 0.673 X$$

The findings yield from the simple linear regression model indicate clearly that there is an effect of artificial intelligence in accelerating the internal audit processes among

organizations. The statistical analysis also demonstrates an overall relationship between the independent variables themselves and the dependent variable; this means that when there is more use of AI, the internal audit processes are becoming faster and more efficient, see Table 9.

Table 10. Presents the analysis of variance (ANOVA) and the F-test results used to assess the statistical significance of the regression model.

Source of variance	Sum of squares	Degree of freedom	Variance	Test	Morale level
				F	
groups Between	238.1	1	238.1	92.77	0.263
groups Within	123.2	48	2.567		
Total	361.3	49			

The ANOVA table 10 showed a significant connection between artificial intelligence and internal audit acceleration processes in the institutions. The F-test was reported to be 92.766, at the significance level of 0.263, which is higher than 0.05-thus the fitted model meets the criteria for statistical significance.

Second Hypothesis: The second research hypothesis, framed-up and declared a null hypothesis, states:

"There is a statistically significant relationship between artificial intelligence technologies and the time required to complete internal audit processes."

Correlation analysis was applied to test for the above hypothesis, as explained below, see Table 11.

Table 11. Shows a test of correlation coefficients.

	The time required to complete internal audits
Artificial intelligence techniques	0.748
	0

The correlation analysis of these research variables-the artificial intelligence technologies and time utilized in completing the internal audit processes-yielded results that indicate a strong and statistically significant direct relationship: that is, the higher the application of AI technologies, the lesser the time needed to complete audit tasks.

Third Hypothesis: The third of the research hypotheses, expressed null, says:

"The use of artificial intelligence in internal auditing has a statistically significant relationship with accounting operations risk management."

Correlation analysis was done to test the hypothesis as described below, see Table 12.

Table 12. Shows a test of correlation coefficients

	Internal audit and risk management associated with accounting processes
Artificial intelligence	0.791
	0

The results of the correlation analysis between the study variables artificial intelligence, internal audit, and risk management related to accounting operations reveal a strong and statistically significant direct relationship. This indicates that the use of artificial intelligence in internal auditing is closely linked to enhanced risk management in accounting processes.

Results

1. Enhancing Internal Audit Efficiency: Studies have shown that AI assists internal audit processes in expediting time and increasing accuracy thereby decreasing the chances of human mistakes, which may improve the quality of audit reports.
2. Transparency and Fraud Detection: AI also assists in patterns that are uncommon in financial data, thus reducing risks and enhancing compliance with the standards.
3. Technical and Human Challenges: The challenges that have emerged cover AI implementation costs, a lack of specialized skills, and complexity with the technical systems and all of these have impacted the widespread adoption of these technologies.
4. Alteration of the Role of an Internal Auditor: Auditors without manual examination skills must now have data analytical and AI skills.
5. Acquire a Competitive Advantage for the Organizations: Organizations that have adopted AI in auditing by the internal audit have been able to enhance the efficiency of their operations and attain beneficial financial decisions.

Recommendations

1. Skills Development for Internal Auditors: Organizations have to train their employees on the AI technologies and tools of data analysis so they can get maximum benefits.
2. Technical Infrastructural Upgrade: Organizations need modern computer systems that will integrate seamlessly with their AI solutions.
3. Enhancing Cybersecurity and Data Protection: Strong security systems against financial data that have passed through AI should be developed.
4. Feasibility Studies before Adoption: Organizations need to study the costs and benefits analysis for internal auditing before finalizing with AI.
5. AI should be Applied Complementarily: AI as an assistant to internal auditors-in contrasts with a replacement for them-ensures true audit decisions by analysis and by technical judgment.

4. Conclusion

AI has emerged as an efficient driver for modernizing almost the entire internal auditing function with recent technological developments. It fast-tracks processes, minimizes error rates, assimilates big data accurately, and ensures transparency and credibility in organizations. However, the advantages seem greater than the challenges, which include high costs, lack of skilled personnel, and data protection issues. Therefore, it necessitates drawing up integrated strategies combining both AI and human expertise in order to reap maximum benefits. In the continued march of technology, internal audit futurism will be captured by AI, thereby urging organizations to invest in and adapt their organizations to the use of these technologies to remain successful in this dynamic business environment.

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