

The contribution of artificial intelligence techniques to reducing audit risks

An Exploratory Study of a Sample of Professionals

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Abstract: The aim of this research is to study the testing of artificial intelligence techniques in reducing audit risks, By studying a sample of professionals Through the contribution of these techniques to reduce audit risks

After conducting statistical analysis It has been found that there is an effective role for artificial intelligence techniques in reducing audit risks related to the three dimensions; Discovery, control, and attachment.

Keywords: artificial intelligence, auditing, audit risks

JEL Codes: M15, M40, M45.

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Introduction:

Artificial intelligence is considered one of the most important innovations of our modern era, It is witnessing great interest from policy makers, companies, and even the public, Efforts are being made to develop this field, Through different types of artificial intelligence with varying capabilities, and diligent efforts to diversify them widely by creating machine learning models. Big data analysis and more, Everyone knows him according to his point of view.

Artificial intelligence allows the machine to develop its cognitive capabilities through its own experience, The machine could become capable of learning and planning, Making decisions quickly and exploitatively, It should be noted that this type is still developing and represents the future.

Artificial intelligence provides many applications of great importance in daily life, Artificial intelligence systems can deal with a huge amount of data, storing and processing it.

Auditing based on risk management in any institution is considered the element that protects the interests of shareholders in particular, And all parties related to the institution in general, An audit based on these risks is the procedures followed by the audit department to direct audit efforts towards the most dangerous areas in the organization, Whether at the level of work centers, or at the level of activities within one work center.

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Research methodology and tools:

In their study, the researchers relied on the descriptive analytical method, In their study, the researchers relied on the descriptive analytical method, The researchers relied on the statistical program SPSS

Importance of the study:

The importance of the research lies in the fact that it is considered a vital and important topic among the topics of accounting and auditing, It is the contribution of artificial intelligence techniques to reducing audit risks, This is because artificial intelligence is the science that seeks to make computers mimic human thinking, In order to find solutions to the various problems and risks that may face the auditing profession, This places auditors and accountants in an inevitable need to use these techniques.

Study objectives:

This study aims to analyze the extent to which artificial intelligence can contribute to reducing audit risks, This is based on the responses received from professionals and academics, and an attempt to analyze and interpret them.

First: Artificial Intelligence techniques:**Introduction:**

Artificial intelligence is considered one of the most important innovations of our time, which pushes society to develop in various, Where artificial intelligence is witnessing great interest from policy makers and companies, This is shown through the different types of artificial intelligence and the effort to diversify artificial intelligence techniques widely, from creating machine learning models to machines and trying to analyze big data, and many other techniques.

The concept of artificial intelligence:

Before defining artificial intelligence, human intelligence must be defined, The definition of artificial intelligence, which mimics or exceeds human intelligence in many fields, will become clear later

Definition of human intelligence:

Alfred defined it as "The ability to understand, judge and think well," As the English philosopher Herbert Spencer defined it as "Actual adjustment of external relations". (Hamdan Sadkhan, Al-Zoufi Kazem, 2023, p. 22)

From a scientific standpoint, Rising and Deznit defined it as "A sum of acquired scientific and intellectual abilities, Which allows knowledge to be acquired and used effectively to solve problems in an objective and constructive manner". (Ibrahim Halal Donna, 2022, p. 45)

From the above it is clear that there is no specific definition of human intelligence, Thus, what led to the lack of a unified and comprehensive definition of artificial intelligence

Every human being is in a state of transformation into a machine, Rather, what is more correct is that the machine is the one that is about to develop into a human being, This was stated by the philosopher Paul Valary in his famous notebooks at the beginning of the nineteenth century, This statement was the beginning of an actual presentation of the problem related to the acceptability of the machine in its coexistence with humans, Thus, this question marked the first proposal in the field of machine intelligence, Or what is known and the most common and used term today is artificial intelligence. (Jaberhe, 2024, p. 25)

Definition of artificial intelligence:

There have been many definitions of artificial intelligence from various viewpoints of scientists and specialists, and each researcher defines it according to his point of view.

It is a branch of computer science and engineering that focuses on developing intelligent machines that can perform tasks that typically require human intelligence, Such as visual perception, speech recognition, decision making, and language translation.

Artificial Intelligence is also known as a subfield of computer science, It focuses on creating intelligent agents capable of performing tasks that typically require human levels of intelligence, These tasks include problem solving, speech recognition, decision making, etc

Main AI components:

Artificial intelligence has a deeper ability to understand the surrounding environment, However, it is classified as artificial intelligence, and all its components must work together, Below are its main components:

- 1- **Machine learning:** It is an application of artificial intelligence that automatically learns and improves from previous sets of experiences without the need for clear programming.
- 2- **Deep learning:** It is a subset of machine learning in which it learns to process a set of data with the help of artificial neural networks
- 3- **Neural network:** They are computer systems modeled loosely on the neural connections of the human brain, and enable deep learning.
- 4- **Cognitive computing:** It aims to recreate the human thinking process in a computer model, Which seeks to imitate and improve the interaction between humans and machines by understanding human language and the meaning of images.
- 5- **Natural language processing:** It is a tool that allows computers to understand, recognize, interpret and reproduce human language and speech.
- 6- **Computer vision:** Computer vision uses deep learning and pattern recognition to interpret image content (charts, tables, PDF images, videos)

Types of artificial intelligence:

Artificial intelligence can be classified into several types based on capabilities, functions, and technology: (Simplilearn, 2024)

1- Classification of artificial intelligence based on capabilities: When it comes to capabilities, we can distinguish between three types of artificial intelligence:

- Narrow or weak artificial intelligence;
- General or strong artificial intelligence;
- Super intelligent artificial intelligence.

2- Classification of artificial intelligence based on functions: On the basis of functions, we can distinguish between four types of artificial intelligence:

- Interactive machines;
- Limited memory;
- Theory of mind;
- Self-aware artificial intelligence.

3- Classification of artificial intelligence based on technology:

- Machine learning;
- deep learning;
- natural language processing;
- robotics;
- computer vision;
- expert systems.

Artificial Intelligence Technologies:

Artificial intelligence techniques refer to the algorithms and data science methods that allow computers to perform tasks that require human intervention, These techniques help artificial intelligence systems learn and perform calculations, And identify patterns, And make predictions about the future.

The most important artificial intelligence techniques can be summarized as follows: (THE UPWORK TEAM , 2024)

1- Machine learning and deep learning: Machine learning is an artificial intelligence technique that uses datasets and algorithms, And artificial neural networks to learn and

improve results over time. Deep learning is a more advanced machine learning method, It uses at least three layers of neural network to simulate the human brain, Improving the ability of artificial intelligence to make decisions.

- 2- **Supervised learning:** Supervised learning is considered one of the artificial intelligence techniques that plays a pivotal role in tasks that require recognizing and predicting patterns, In this method, AI systems learn a labeled data set where each data point is associated with a known outcome.
- 3- **Unsupervised learning:** This technique is different compared to supervised learning, Artificial intelligence systems analyze unclassified data, Where predetermined results are not provided, Its aim is to reveal structures and patterns within policies without any prior knowledge.
- 4- **Reinforcement learning:** It is a n form of machine learning that allows artificial intelligence to learn by trial and error, Instead of giving form data, And not giving him a chance to learn anything else, Reinforcement learning changes things by giving the model punishments and rewards for its actions.

Second: Auditing

Auditing concept:

Definitions of auditing have varied from one reference to another

First definition: The American Accounting Association defined it as an organized and systematic process for collecting evidence and evidence related to the results of economic activities and events and evaluating them objectively, This is to determine the extent of compatibility and conformity between these results and the established standards, And communicate this to the parties concerned. (Hussein Al-Qadi, Hussein Dahdouh, 1999, p. 13)

Second definition: An audit is an examination of an organization's financial statements to ensure their reliability, Its health and degree of loyalty, This examination is conducted by an independent professional called an auditor. (Muhammad Al-Tahami Tawaher, Masoud Siddiqi, 2003, p. 09)

Third definition: It is a critical examination that allows the organization to scrutinize information and judge the operations that have taken place, And the public systems that produced the information. (Jumaa, Ahmed Halimi, 2009, p. 25)

Audit risks:

The majority of organizations have realized the importance of identifying and monitoring the risks surrounding them, Obtaining sufficient information about the economy and laws that affect the practice of its activity.

Definition of audit risks: Audit risks are defined by the Saudi Authority SOCPA, t is the possibility that the auditor may issue an absolute opinion on financial statements that contain fraud or significant errors. (Saudi Organization for Certified Public Accountants, 2000, p. 721)

It is also defined as the risks derived from the logic of the possibility of fraud and errors in the financial statements, Therefore, it must be discovered by the auditor. (Thunaibat et al, 2007, p. 15)

Audit risk model: There is a consensus among professional bodies and specialists that audit risk has three main components, International auditing standards require that the auditor conduct the audit in a way that ensures that there is reasonable assurance about discovering material errors in order to reduce audit risks, The components of audit risk can be expressed through the audit risk model, which includes three main components, These are inherent risks, control risks, and detection risks.

Third: The relationship of the use of artificial intelligence techniques to audit risks:

Artificial intelligence is becoming increasingly important in the accounting and auditing profession, Robotic operations, data analytics, artificial intelligence, and machine learning, For example, there are technologies that will continue to have an impact on the audit process, The role of the auditor will also be radically affected by technology in the long term, There are practices by major companies with cloud computing and big data, And artificial intelligence in performing its work, Artificial intelligence is used to improve the rate at which auditors can detect fraud and unusual transactions, As well as information that is high risk. (Rawaa , 2023, pp. 26-33)

- 1- **Expert systems in audit quality:** Artificial intelligence applications are designed based on three basic pillars, Including the database in which facts and experiences of accountants and auditors are stored, The database includes laws, principles, and standards of procedures governing the accounting and auditing professions, Expert systems positively affect the quality of auditing, As the company needs to make a decision for a specific problem, Where it is based on knowledge, It is a form of artificial intelligence that is similar to the logic of human thinking in an automated way, It has the ability to process a huge amount of data in an intelligent way and provide reports quickly, which makes it more efficient.
- 2- **Machine learning and deep learning in audit quality:** Machine learning technology positively affects the quality of auditing because it has many features, Among them is its ability to analyze big data quickly and with high accuracy, Which saves time and, independently, predicts the future, This helps improve the planning process and make accurate decisions, Deep learning techniques also work with specific neural networks to build a model to detect fraud in financial policies, Which in turn leads to reducing losses resulting from fraud in financial statements.
- 3- **Continuous auditing of audit quality:** The continuous auditing technique positively affects the quality of the audit, This technology has a new approach based on providing real-time information to perform the audit process, This helps the auditor to collect data continuously and analyze it immediately, This enables it to improve the accuracy of results, detect risks and errors, and predict the future.

- 4- **Natural language processing in quality auditing:** This technique positively affects the quality of the audit, It is able to analyze financial texts to understand the meanings of sentences and phrases and ensure their accuracy, This contributes to the analysis of financial documents and data, As well as detecting fraud and deception in financial documents.
- 5- **Automation of robotic processes in quality auditing:** Robotic process automation technology positively affects the quality of auditing, It can reduce the number of errors that occur as a result of data transfer, Performing audit tests, detecting deviations, and measuring materiality risks in a timely and correct manner.
- 6- **Artificial Neural Network Systems (ANNS) in auditing quality:** Using these systems is crucial in forecasting future returns, Detect material violations, errors, fraud, and manipulation of financial statements, Therefore, there is great importance in using this technique in general and discovering fundamental errors when auditing financial statements in particular, Which the beneficiary parties depend on in making various decisions.
- 7- **Genetic algorithms (GA) in audit quality:** Genetic algorithms are used for decision support to detect weaknesses in internal control, Providing information that helps the auditor to predict the company's continuity, Moreover, Some audit firms have employed genetic algorithms as a decision support tool when auditing taxes, It provides information as to whether the company is delinquent in paying taxes, As well as conducting risk assessments based on the probability of defaulting on taxes.

Second: Field Study

1. Procedural Analysis of the Study

The applied study aims to identify the role and contribution of artificial intelligence (AI) technologies in reducing audit risk, by collecting and analyzing data in order to test the research hypotheses using the "SPSS" software for data processing.

1.1 Statistical Methods Used

The main statistical methods used in this study include:

- a. **Arithmetic Mean:** Calculated for each statement as well as for each axis.
- b. **Standard Deviation:** Used to measure the dispersion of the sample responses.
- c. **Frequency Distribution and Percentages:** Used to describe the obtained responses.
- d. **Cronbach's Alpha Coefficient:** Used to measure the internal consistency of the instrument and ensure its reliability.

1.2 Validity and Reliability of the Instrument

To ensure the validity and reliability of the study instrument, Cronbach's Alpha coefficient was calculated. A value greater than 0.60 is considered acceptable, as shown in the following table:

Table (01): Validity and Reliability of the Study

Axes (Audit Risk Types)	Number of Items	Cronbach's Alpha
01. Detection Risk	06	0.798
02. Inherent Risk	06	0.801
03. Control Risk	06	0.781
Total	18	0.881

Source: Prepared by the researchers based on SPSS results.

Comment:

The table shows high reliability coefficients ranging between 0.781 and 0.801. The overall reliability coefficient reached 0.881 (88.1%), which exceeds the minimum acceptable threshold of 60% in social sciences. Therefore, the questionnaire demonstrates a high level of reliability.

1.3 Measurement Scale

A five-point Likert scale was used, as it is one of the most widely used tools for measuring opinions due to its balanced structure. The responses were coded as follows:

Table (02): Five-Point Likert Scale

Scale	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Score	1	2	3	4	5
Mean Range	1.79-1	2.59-1.80	3.39-2.60	4.19-3.40	5-4.20

Source: Prepared by the researchers based on SPSS results.

1.4 Description of the Study Sample

The study sample consisted of 32 professionals specialized in auditing. After data collection and analysis using SPSS, percentages for personal and professional variables were calculated as shown below:

Table (03): Characteristics of the Study Sample

No	Variable	Category	Number	Percentage%
01	Gender	Male	29	80
		Female	07	20
02	Age Group	Less than 30	7	19.4
		40 –31	4	11.1
		50 –41	5	13.9
		Over 50	20	55.6
03	Educational Qualification	Master	11	30.6
		Magister	4	11.11
		License (Bachelor)	21	58.3
		Doctorate	00	00
04	Scientific Specialization	Accounting	15	41.7
		Finance	21	58.3
05	Years of Experience	Less than 5 years	10	27.8
		5–10 years	15	41.7
		More than 10 years	11	30.6

Source: Prepared by the researchers based on SPSS results.

Comment:

The results indicate that most respondents are male. The dominant age group is over 50 years (55.6%). The sample shows diverse and relatively high educational qualifications, with a predominance of Bachelor's degree holders. Most respondents have متوسط experience (5–10 years), and the majority specialize in finance (58.3%).

2. Analysis of Trends Study Dimensions

2.1 Analysis of Trends Sample Opinions Regarding the First Axis (Detection Risk)

The opinions of the sample regarding the first axis can be illustrated through the following table:

Table No. (04): Trends of Sample Members' Opinions Regarding the First Axis

Statements	Mean	Standard Deviation	General Trend
Artificial intelligence techniques help improve the accuracy of auditing procedures.	4.19	0.764	Agree
Artificial intelligence techniques reduce the likelihood of not detecting material errors.	4.12	0.826	Agree
Artificial intelligence techniques contribute to examining all transactions instead of relying on sampling.	4.13	0.757	Agree
Artificial intelligence techniques help detect errors and fraud more quickly.	3.90	0.923	Agree
Artificial intelligence techniques reduce reliance on the auditor's personal judgment.	3.75	1.035	Agree
Artificial intelligence techniques contribute to improving the quality of audit evidence.	3.82	0.815	Agree
Overall Mean	3.9142	0.51594	Agree

Source: Prepared by the researchers based on SPSS results.

Comment:

The table shows that all respondents agree that artificial intelligence techniques significantly contribute to reducing auditing risks related to detection. The mean values of their responses ranged between (4.19 and 3.63), which are high to very high values within the Likert scale range. The overall mean for the study sample reached (3.91) with a standard deviation of (0.51).

2.2 Analysis of Sample Members' Opinions Regarding the Second Axis (Inherent Risk)

The opinions of the sample members regarding the second axis can be illustrated through the following table:

Table No. (05): Trends of Sample Members' Opinions Regarding the Second Axis

Statements	Mean	Standard Deviation	General Trend
Artificial intelligence techniques help analyze complex operations within the organization.	3.82	0.943	موافق
Artificial intelligence techniques contribute to improving the auditor's understanding of the organization's environment.	4.00	0.905	موافق
Artificial intelligence techniques help identify high-risk areas.	4.04	0.929	موافق
Artificial intelligence techniques enable the analysis of large amounts of financial and non-financial data.	4.19	0.909	موافق
Artificial intelligence techniques contribute to predicting potential risks before they occur.	3.66	0.930	موافق
Artificial intelligence techniques help detect unusual patterns in data.	3.82	0.952	موافق
Overall Mean	3.9360	0.59802	موافق

Source: Prepared by the researchers based on SPSS results.

Comment:

The table above shows that respondents' trends are high regarding the contribution of artificial intelligence techniques in reducing audit risks related to inherent risk. The mean values ranged between (4.04 and 3.66), while the standard deviation ranged between (0.909 and 0.952).

2.3 Analysis of Sample Members' Opinions Regarding the Third Axis (Control Risk)

The opinions of the sample members regarding the third axis can be illustrated through the following table:

Table No. (06): Trends of Sample Members' Opinions Regarding the Third Axis

Statements	Mean	Standard Deviation	General Trend
Artificial intelligence techniques help evaluate the effectiveness of the internal control system.	3.84	0.809	Agree
Artificial intelligence techniques contribute to detecting weaknesses in control.	3.61	0.984	Agree
. Artificial intelligence techniques help monitor operations continuously.	4.05	0.799	Agree
. Artificial intelligence techniques help monitor operations continuously. Artificial intelligence techniques contribute to improving the internal control system within the organization	3.82	0.833	Agree
. Artificial intelligence techniques help reduce errors resulting from weak control	4.15	0.723	Agree
Artificial intelligence techniques enhance the reliability of financial information.	3.93	0.785	Agree
Overall Mean	3.8969	0.54418	Agree

Source: Prepared by the researchers based on SPSS results.

Comment:

It is observed from the table above that the axis related to audit risks associated with control recorded a relatively high overall mean of **"3.89"**, with a standard deviation of **"0.54"**. The mean values for this axis ranged between **"4.15"** and **"3.61"**, indicating a generally high level of agreement among respondents.

3 Analysis of Study Dimensions

3.1 Analysis of the First Axis (Detection Risk)

The results show that respondents agree that AI technologies significantly contribute to reducing detection risk. Mean values ranged between high and very high levels on the Likert scale, with an overall mean of **"3.91"** and a standard deviation of **"0.51"**

3.2 Analysis of the Second Axis (Inherent Risk)

The findings indicate strong agreement among respondents regarding the role of AI technologies in reducing inherent risk. Mean values ranged between ****3.66** and **4.04****, reflecting a high level of agreement.

3.3 Analysis of the Third Axis (Control Risk)

The results show that the control risk axis recorded a relatively high mean of "3.89" with a standard deviation of "0.54", indicating agreement among respondents on the effectiveness of AI in improving internal control systems.

4. Hypothesis Testing

4.1 First Hypothesis

AI technologies contribute to reducing detection risk.

This hypothesis was confirmed based on the first axis. Results show that AI improves audit procedures, reduces the likelihood of material misstatements, and enhances the quality of audit evidence.

4.2 Second Hypothesis

AI technologies contribute to reducing inherent risk.

This hypothesis was confirmed based on the second axis, as results indicate that AI helps analyze complex operations, identify high-risk areas, and predict potential risks.

4.3 Third Hypothesis

AI technologies contribute to reducing control risk.

This hypothesis was confirmed based on the third axis. AI technologies help identify high-risk areas affecting audit quality and enhance the detection of unusual patterns in organizational data.

Based on respondents' answers across the three axes, the research problem has been adequately addressed.

Conclusion

Through both theoretical and field study of AI technologies and their contribution to reducing audit risk (inherent, detection, and control), from the perspective of professionals in accounting and auditing, several key findings and recommendations were reached:

Findings

- ✓ AI technologies play a highly effective role in reducing audit risk.
- ✓ Despite their effectiveness, several challenges limit their implementation.
- ✓ AI enables faster and more accurate detection of errors and fraud compared to traditional methods.
- ✓ AI significantly enhances the effectiveness of internal control systems.
- ✓ The use of AI improves risk prediction capabilities within organizations.

Recommendations

- ✓ adopting AI technologies in auditing processes to improve report quality.
- ✓ Investing in technological infrastructure within organizations.
- ✓ Implementing strict data protection policies.
- ✓ Promoting integration between AI technologies and auditing practices.
- ✓ Ensuring a balance between AI capabilities and human professional judgment.

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