

Artificial intelligence and digital auditing:A new era for advancing accounting and auditing technologies (opportunities and challenges)

(a survey at the level of the parent Hasnaoui institution - Chiali Import and Export Company and some audit offices in the wilaya of - Sidi Bel Abbes-)

الذكاء الاصطناعي والتدقيق الرقمي: عصر جديد لخدمة وتطوير تقنيات المحاسبة والتدقيق (الفرص والتحديات) _
(دراسة استقصائية على مستوى مؤسسة حسناوي الأم وشركة شيالي للاستيراد والتصدير وبعض مكاتب التدقيق بولاية
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Abstract:

Artificial intelligence and digitization is the revolution of the present and the future, which will make a great qualitative leap in all areas of life because of its amazing effects and great benefits in facilitating and developing human lives and solving many complex problems efficiently and effectively; Taking into account the challenges and risks associated with this in light of various environmental changes; On the practical side, a questionnaire tool was used and an interview with specialists in the field was used, and the results of the research concluded that the adoption of artificial intelligence and digital auditing contribute significantly to reducing errors, enhancing accuracy, detecting fraud and analyzing complex data based on smart algorithms that allow work faster and with advanced methods and techniques compared to traditional methods. And provide better services to customers.

Keywords: Artificial Intelligence, Digital Auditing, Accounting and Auditing

JEL Classification Cods : O3, O14, M0, M42.

الملخص:

يعتبر الذكاء الاصطناعي والرقمنة ثورة الحاضر والمستقبل التي ستحدث نقلة نوعية عظيمة في كل مجالات الحياة لما له من تأثيرات مذهلة وفوائد جمة في تسهيل وتطوير حياة البشر وحل الكثير من المشكلات المعقدة بكل كفاءة وفعالية؛ يهدف هذا البحث إلى تبين مزايا الذكاء الاصطناعي والتدقيق الرقمي في تقديم العديد من الخدمات في مجال المحاسبة والتدقيق كتحسين دقة وشفافية البيانات والتقارير والمعلومات المالية، مع مراعاة التحديات والمخاطر المرتبطة بذلك في ظل التغيرات البيئية المختلفة؛ وفي الجانب التطبيقي تم الاستعانة بأداة استبيان ومقابلة مع المختصين في المجال وخلصت نتائج البحث إلى أن اعتماد الذكاء الاصطناعي والتدقيق الرقمي يساهمان بشكل كبير في تقليل الأخطاء وتعزيز الدقة وكشف الاحتيال وتحليل البيانات المعقدة بالاعتماد على خوارزميات ذكية تتيح العمل بشكل أسرع وبطرق وتقنيات متطورة مقارنة بالأساليب التقليدية وتقديم خدمات أفضل للعملاء.

الكلمات المفتاحية: الذكاء الاصطناعي، التدقيق الرقمي، المحاسبة والتدقيق

تصنيفات JEL: O3، O14، M0، M42

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Introduction

The rapid developments in the world today in the field of digital technology have led to the emergence of new methods and methods that have made a qualitative leap in many areas, including accounting and auditing, and perhaps the most prominent of these technologies is artificial intelligence, which includes the use of smart technologies such as: cloud computing, blockchain, the Internet of Things, big data, etc. Which has played a major role in improving the quality of accounting, auditing and services provided to customers, by enhancing the operational efficiency of the institution's resources, increasing the accuracy and transparency of financial data and information, reducing human errors and reducing fraud. In light of this, we address the following problem:

The problem:

With the acceleration of digitization in the field of accounting and auditing in changing and volatile environments, and the ability of organizations to absorb and employ new technologies and optimally overcome the challenges and risks associated with them, the following main problem arises:

- ✳ How can digital auditing technologies and artificial intelligence contribute to the service and development of accounting and auditing in light of the challenges and risks faced by the economic and financial environment?

Sub-questions

1. What are the most prominent benefits and applications of artificial intelligence in the field of accounting and auditing?
2. How can digital auditing reduce errors, detect fraud, and increase efficiency and quality?
3. What are the most important challenges facing the application of artificial intelligence and digital auditing in organizations?

Hypotheses

- **The first hypothesis:** the application of artificial intelligence and digital auditing contributes to improving accuracy and efficiency and developing the auditing and accounting profession
- **Second hypothesis:** It is possible that artificial intelligence will replace humans in performing all functions and thus threaten the future accounting and auditing profession

Importance of research

This research contributes to enriching the scientific knowledge of academic researchers and professionals about the importance of artificial intelligence and digital auditing in the development of the field of accounting and auditing, by highlighting the advantages of digital auditing and its many benefits in improving the quality of financial reports, enhancing transparency, and supporting decision-makers and businessmen in adopting policies and strategies based on smart systems, and finally, Provide important recommendations to institutions, accountants and auditors on addressing risks and overcoming challenges.

Objectives

1. Highlight the essential role of digital auditing and artificial intelligence in improving the quality, efficiency and effectiveness of accounting and auditing.
2. Demonstrate the potential provided by digital technology and smart systems in detecting financial corruption and fraud and improving control
3. Highlight the risks and challenges facing organizations in applying artificial intelligence and digital auditing.

Methodology

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In this research, we relied on the descriptive approach to understand the theoretical framework of artificial intelligence and its uses in the field of accounting and auditing, and to identify digital auditing techniques and applications, and the analytical approach to analyzing statistics published in some international reports, as well as analyzing the results of the interview and questionnaire using the statistical program SPSS.

Axes of the intervention

First axe: Theoretical Concepts on Artificial Intelligence and Digital Auditing

Second axe: The Role of Artificial Intelligence in the Service and Development of Accounting and Auditing

Third axe: Challenges of Applying Artificial Intelligence in Accounting and Auditing

Fourth axe: A field study at the level of Hasnaoui, Chiali and some audit offices in the wilaya of Sidi Bel Abbes

First axe: Theoretical Concepts on Artificial Intelligence and Digital Auditing

Artificial intelligence is one of the most important things that have become the world's concern today due to its great importance in facilitating all aspects of daily and practical life and its many benefits.

I. Artificial Intelligence

Firstly: Definition of Artificial Intelligence

"Artificial intelligence means the ability of a computer or machine to simulate the human mind, such as learning from data and experiments, recognizing objects or objects, understanding and responding to language, making decisions, and overcoming difficulties.(Maha & Salmo, 2021)

The intelligence Artificial does directing Computer To perform things Instead of Human in a way Easy and better, and is done That by languages Specialized and intelligent programming that Designed to simulate Computer For human behavior. (Adel Amirhom, 2022)

Through these definitions, we conclude that artificial intelligence is a smart robot related to the computer programmed in smart languages and equipped with data programs so that it becomes able to compete with the human mind and distinguish intelligence and ease of understanding and learning.

Secondly: Application of Artificial Intelligence in Accounting and Auditing

Applied Artificial intelligence in The field of accounting and auditing according to the business and the benefits to be reached, and these are its most prominent uses: **(The latest application of artificial intelligence in accounting, 2023)**

- ♦ Perform accounting worksuch as invoice processing and monitoring suppliers and customers
- ♦ Facilitate data recording, processing, analysis and monitoringof monthly financial performance
- ♦ Fraud detection and improvement of the legal control process
- ♦ Improve communication between customers
- ♦ Training of accountants and auditors

II. Digital Audit

One of the most important strategic issues that occupy the world today is digital technology because its consequences affect all work, administrative methods, the way employees work and efficiency, relations with customers and the performance of the institution.

Firstly: The concept of digital technology:

Technological Digital is Techniques Smart and sophisticated for example, artificial intelligence, virtual reality, and technologies such as cloud computing and blockchain. All of these aspects must be integrated by digital transformation.**(Olivier Salustro & and all, 2019, pp. 5,14)**. It is also defined as: all electronic devices, including hardware and software, that process data after encoding or encrypting it into a machine language (0, 1), and these devices are often computers and smartphones. Etc. **(Aouissi & Gharbi , 2022)**

Secondly: Definition of Digital Auditing: (Safia & Torchi, 2020)

Digital auditing is defined as: "a structured process aimed at obtaining evidence related to assurances about the correctness and integrity of financial statements, evaluating them in an objective manner to verify their conformity with objective standards and communicating the results to the relevant parties using electronic and information systems.

Third: Objectives of the Legal Auditor within the framework of digital audit:

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The Statutory Auditor aims to achieve the desired objectives in the following areas:(Olivier Salustro & and all, 2019, pp. 5,14)

- Ensure effective and good governance of information systems
- Proficiency and experience in controlling digital computer programs
- IT project management and continuity plan
- Data protection, information security and confidentiality

Fourth:Audit Areas Digital:(Financial Audit Authority Government, 2019)

1. Process and data audits include:
 - Logical access controls and data field input checks
 - Rules and processes for business suitability and workflow.
2. Audit of the general control systems for digital information technology, which include the following:
 - ♦ Digital IT Governance and Strategic Planning
 - ♦ Control over the management of digital IT projects.
 - ♦ Data analysis using digital audit software
 - ♦ Conduct an investigation into digital technology and information security risks.

Fifth: Advantages of Digital Auditing:

Digital auditing is characterized by:(Essam El Samarai, 2020)

1. **Digital auditing and cost advantage realization:**Digital auditing through the use of audit software to audit financial statements contributesto reducing the cost of audit services and the time required to planand complete them quickly and increase the profitability of audit offices
2. **Digital Auditing and Quality Assurance:**If digital auditing is used in the implementation of financial operations, it affects the quality of auditing, so audit tasks must be carried out objectively and technological techniques must be used by qualified auditors in auditing financial statements.
3. **Digital Auditing and Market Share:** The use of digital auditing in auditing financial statements contributes to increasing the accuracy, transparency and reliability of the institution, especially inlight of the competitive environment witnessed by institutions in the marketin thefield of using information technology, which encourages association with the audit

Second axe: The Role of Artificial Intelligence in the Service and Development of Accounting and Auditing

In the digital age and as we move towards the emergence of more developments, auditors must adopt artificial intelligence, where robots take over repetitive and time-consuming tasks, and we will learn about this in this axis:

Firstly: Advantages of Artificial Intelligence In fighting financial corruption and avoiding mistakes:(Deftara Elmarkaz, 2023)

- ❖ AI automatically collects important data and information, classifies it, performs routine daily operations efficiently and accurately, and detects excesses and hidden truths.
- ❖ AI helps companies quickly classify and record all transactions and processes, continuously reconcile and audit accounts, and make necessary adjustments when needed.
- ❖ AI can significantly reduce accounting errors, and reduce fraud and financial fraud

Secondly: The advantages of artificial intelligence in the audit service

Artificial intelligence offers several advantages to serve the audit task, and this is what we will present below: **(Maha & Salmo, 2021)**

- ❖ Under the traditional methods of performing the audit task, there was a possibility that the auditor would fail to discover material errors due to the sufficiency of examining a limited sample of the population, while using artificial intelligence techniques, the entire population could be examined, regardless of its number.
- ❖ Through artificial intelligence, the highest level of reasonable assurance can be obtained in the fastest time and with minimal effort. Instead of spending long hours reviewing contracts, the AI robot does it in record time, which has relieved the auditor of the burden of fatigue and time.
- ❖ Artificial intelligence contributes to enhancing communication with customers, building a strong relationship with them and providing them with better services.

Third: The impact of artificial intelligence on the accounting and auditing profession:

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Artificial intelligence systems have become capable of carrying out many accounting tasks, such as bank reconciliations, tax audits and collection, and forecasting financial risks and evaluated, command Which led many to wonder about the impact of artificial intelligence on the future of accounting and auditing, and we will learn about that below: **(Deftara Elmarkaz, 2023)**

- Some companies that have applied artificial intelligence in accounting have started replacing some of the functions performed by the accountant with artificial intelligence programs and applications, but this does not mean abandoning the profession completely.
- Digital auditing and artificial intelligence have contributed to improving the efficiency of the audit process, increasing the quality of audit services, and increasing the value and profitability of institutions
- The nature of an accountant's work will change in the coming years and the likelihood of new accounting disciplines emerged, including other tasks, such as providing more specialized financial advice or diversifying the services that can be provided to clients.

Third axe: Challenges of Applying Artificial Intelligence in Accounting and Auditing

Senior officials and experts in the field of business have realized the importance of adopting artificial intelligence techniques in accounting and auditing, however, it is necessary to see a change in the constructive mindset of financial organizations, and professionals in the world of accounting and auditing.

First: Challenges facing countries in applying artificial intelligence in accounting and auditing:

Countries seeking to use technology and artificial intelligence in the field of accounting and auditing face a range of challenges, including: cybersecurity, protection of financial data and sensitive information. Countries must take serious measures to ensure the security and confidentiality of this data in order to maintain integrity and confidence in accounting and auditing processes. **(Bank, 2023)**

Second: Artificial Intelligence Risks:

General Risks Errors and malfunctions:(Badr, 2023)

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- Artificial intelligence is man-made So during programming, it is possible for programmers to create an algorithm that carries their own personal biases.
- Algorithms can be so complex that even those who created the algorithm cannot explain how to arrive at the prediction of the output, i.e., the lack of clarity of legal liability
- Data privacy Providing AI models with sensitive personal information can pose a risk and can cause security breaches by hackers and access to and modification of sensitive information.
- The use of AI in some design tasks may lead to errors or malfunctions in the system that may lead to financial losses or other negative consequences.

Fourthaxe: A field study at the level of (Hasnaoui Company, Chiali Company for Import and Export and some audit offices) {in the wilaya of Sidi Bel Abbès}

1. Description of the variables of the study

1.1: Study population: The study population is represented by the employees of the Accounting and Finance Department and the Management and Control Department of Hasnaoui and Chiali: the financial accountant, the assistant accountant, the financial manager, the management controllers.

2.1: Sample and study tool: 50 questionnaires were distributed, divided as follows: 20 questionnaires at the headquarters of Hasnaoui, 20 forms at Chiali Import and Export Company, 10 forms in 3 audit offices in addition to the interview where oral questions were included with employees to answer hypotheses. The following table shows the number of forms distributed in Hasnaoui, Chiali and audit offices.

Table N°01: Number of forms distributed in Hasnaoui and Chiali and audit offices

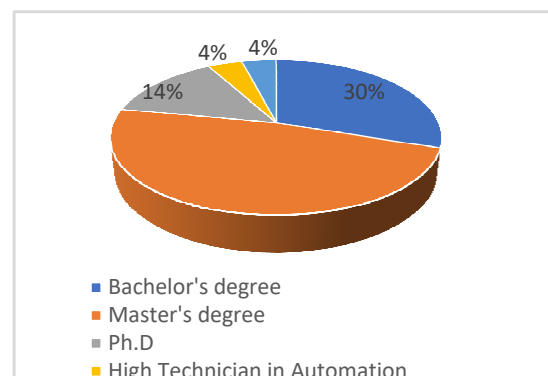
Place	Number of forms distributed
Parent Hasnaoui company	20
Chiali Company for Import & Export	20
Audit Offices	10

Source: Prepared by the researcher based on the data

Table 02: Distribution of study sample Scientific qualification

Qualification	Number	Percentage
Bachelor	15	30%
Master	24	48%
Doctor	7	14%
High Technician in Information Systems	2	4%
State Engineer in Computer Science	2	4%
Total	50	100%

Figure N° 03: Proportions of the study sample of distribution



Source: Prepared by the researcher based on the data

Table 03: Distribution of study sample years of experience

Category	Number	Percentage
Less than 2 years	6	12%
2 to 5 years	18	36%
5 to 10 years	10	20%
More than 10 years	16	32%
Total	50	100%

Figure N° 4: representation of according to years of experience

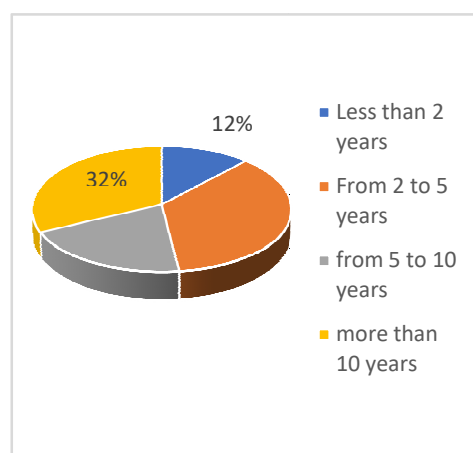


Table N°04: Respondents' answers about the first axis: The role of digital auditing in accounting and auditing

Paragraphs	Iteration				Arithmetic-mean	Percentage	Degree of approval
	Agree	Strongly agree	Disagree	Neutral			
Digital audit enhances the reliability of financial statements.	24	16	8	2	1.62	48%	Agree

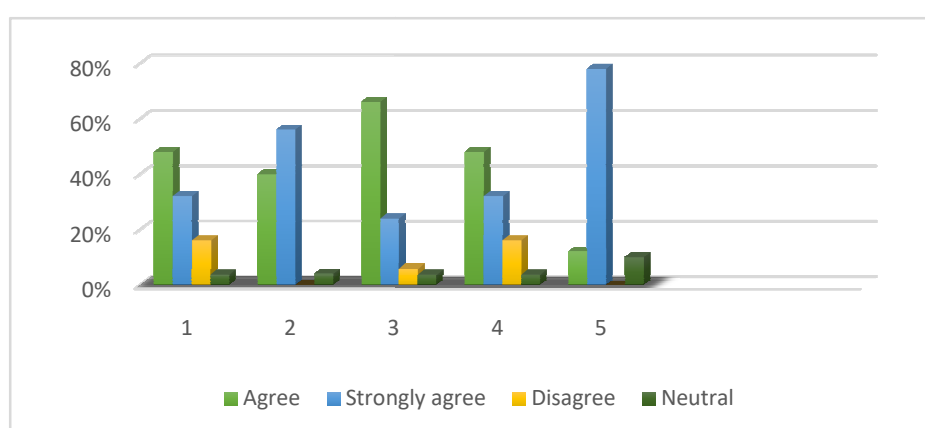
Title: Artificial intelligence and digital auditing: a new era for advancing...

Using digital tools in auditing saves time and increases efficiency.	20	28	0	2	1.66	56%	Strongly agree
Digital auditing reduces human errors compared to traditional methods.	33	12	3	2	1.75	66%	Agree
Digital auditing helps improve transparency within the organization.	24	16	8	2	1.62	48%	Agree

Source: Prepared by the student based on the outputs of the SPSS program

Interpretation: We note through the table that the arithmetic average of each answer for the statements is greater than 1, which means that most of the answers were in agreement, and this is shown by the percentages associated with the highest answers for each phrase, where the largest percentage of answers for the first statement with approval reached 48%, while the second phrase reached the largest percentage of strong approval response 56% of the total answers of the sample members, the third phrase by 66% approval, and for the fourth statement 48% With approval.

Figure N°05: Ratios of answers to each question in the first axis



Source: Prepared by the researcher based on the outputs of the SPSS program

Table N° 05: The results of the respondents' opinions for the total axis statements

Total phrases of the first axis	Statistical indicators		Direction
	M	SD	Approval
	1.72	1.31	

Source: Prepared by the student based on the outputs of the SPSS program

Interpretation: According to the results, the average of the total statements of the M axis = 1.72 and this indicates a general tendency towards strong approval, which means that digital auditing has a positive effect in enhancing the reliability and transparency of data, reducing cost, effort and time, and reducing errors as the standard deviation indicates: SD= 1.31 that there is convergence in the answers, meaning that the approval ratio for each statement seems close and close to the average, which means that the deviation ratio is small and does not affect the amount of dispersion in the response

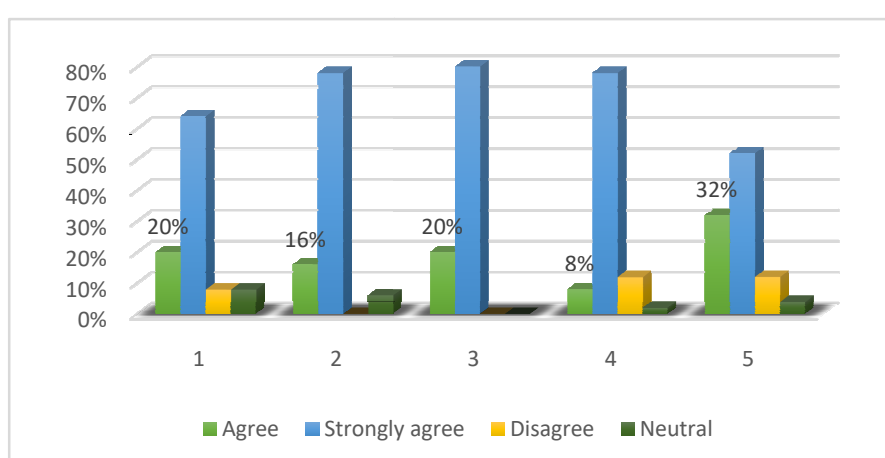
Table N° 06: The answers of the study sample members about the second axis

Paragraphs	Iteration				Arithmetic mean	Percentage	Degree of approval
	I agree	Strongly agree	Disagree	Neutral			
Artificial intelligence helps improve the accuracy of accounting processes.	10	32	4	4	1.6	64%	I agree
Artificial intelligence contributes to detecting accounting errors and improving audit efficiency.	8	39	0	3	1.52	78%	Strongly agree
High cost and lack of technical skills pose a challenge to AI adoption.	10	40	0	0	1.6	80%	I agree
Artificial intelligence can help analyze financial data faster and more accurately.	4	39	6	1	1.46	78%	I agree

Source: Prepared by the researcher based on the outputs of the SPSS program

Interpretation: We note through the table that the arithmetic average of each answer for the statements is greater than 1, which means that most of the answers were in agreement, and this is shown by the percentages associated with the highest answers for each phrase, where the largest percentage of answers for the first statement with approval reached 80%, while the second phrase reached the largest percentage of strong approval response 78% of the total answers of the sample members, the third phrase by 80% approval, and with regard to the fourth phrase 78% With approval.

Figure N°05: Ratios of answers to each question in the second axis



Source: Prepared by the student based on data analysis in the SPSS program

Table N°07: The results of the opinions of the respondents for the total statements of the second axis:

Total phrases of the first axis	Statistical indicators		Direction
	M	SD	Consent
	1.55	1.24	

Source:Prepared by the student based on the outputs of SPSS

Interpretation: According to the results, the average total statements of the M axis = 1.55, and this indicates a general tendency towards strong approval, which means that artificial intelligence has a significant role in enhancing data accuracy, improving efficiency, detecting errors and analyzing data Standard deviation also indicates: SD= 1.24 that there is convergence in the answers, meaning that the approval ratio for each statement seems close and close to the

Title: Artificial intelligence and digital auditing: a new era for advancing...

average, which means that the deviation ratio is small and does not affect the amount of dispersion in the response

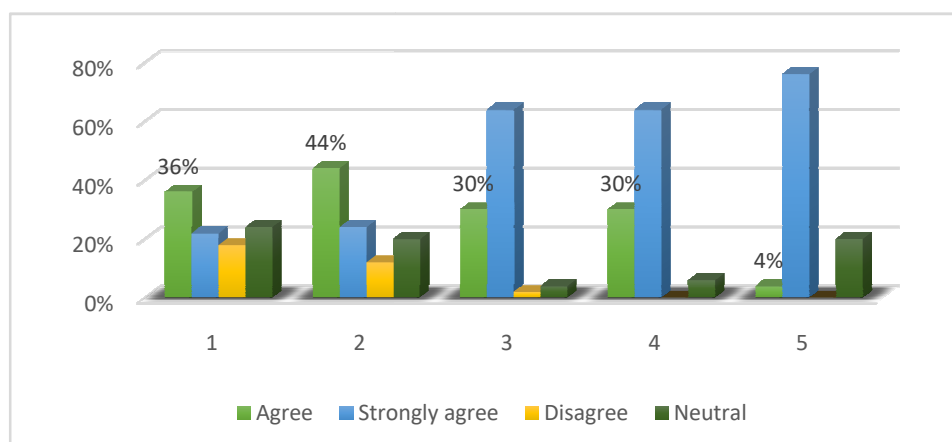
Table N°08: The respondents' answers to the third axis: integration between artificial intelligence and digital auditing

Paragraphs	Iteration				Arithm etic mean	Percen tage	Degree of approval
	I agree	Strong ly agree	Disagr ee	Neutr al			
The integration of AI and digital auditing enhances the predictability of financial risks.	18	11	9	12	1.35	36%	I agree
This integration supports strategic decision-making based on accurate data.	22	12	6	10	1.46	44%	I agree
The integration between artificial intelligence and digital auditing helps in the early detection of financial fraud.	15	32	1	2	1.6	64%	I agree Strongly
The integration between AI and digital audit improves financial reporting and compliance.	15	32	0	3	1.59	64%	I agree Strongly

Source: Prepared by the student based on the outputs of SPSS

Explanation: We note through the table that the arithmetic average of each answer for the statements is greater than 1, which means that most of the answers were with strong approval, and this is shown by the percentages associated with the highest answers for each phrase, where the largest percentage of answers for the first statement with approval reached 36%, while the second statement reached the largest percentage of approval answer 44% of the total answers of the sample members, the third phrase by 64% with strong approval, and with regard to the fourth statement 64% With approval .

Figure No: Ratios of answers to each question in the third axis



Source: Prepared by the researcher based on the outcomes of the SPSS program

Table N° 09: The results of the opinions of the respondents for the total statements of the third axis

Total phrases of the first axis	Statistical indicators		Direction
	M	SD	Strongly agree
	1.46	1.2	agree

Source: Prepared by the researcher based on the outcomes of the SPSS program

Explanation: According to the results, the average total statements of the axis $M = 1.46$ and this indicates a general tendency towards strong approval, which means that there is integration between digital auditing and artificial intelligence in improving financial reporting accurately and easily detecting errors and fraud. It helps to predict financial risks and make strategic decisions, but the application of the latter two needs to qualify and train workers to deal with modern technologies as indicated by the standard deviation $SD = 1.2$ that there is convergence in the answers, meaning that the approval rate for each statement seems close and close to the average, which means that the deviation ratio is small and does not affect the amount of dispersion in the response.

The end

Artificial intelligence and digital auditing area major revolution in the field of accounting and auditing, as they have provided many opportunities to increase performance efficiency and improve business quality by imparting accuracy, transparency and reliability in data and information. However, the adoption of smart and digital technology needs to address the challenges associated with providing the necessary resources and infrastructure. Qualified and trained professionals to understand and deal with these techniques and reform the legal framework. Investing in research and development to keep pace with changes in the economic and technological environment.

Results

1. Artificial intelligence has a major role in detecting irregularities and fraud efficiently and effectively, solving complex problems and difficult matters, and analyzing data and information more accurately, which has made it easier for the profession of accountants and auditors.
2. There are many challenges that hinder the adoption of artificial intelligence technology and digital auditing, including weak investments in digital infrastructure, lack of local competencies, instilling a culture and idea of technological development in society, as well as lack of training of experts, technicians and qualified employees, in addition to the risk of privacy protection and data security.
3. Statistics reports showed that developed countries that have adopted artificial intelligence and digital auditing techniques have recorded remarkable development and improvements in the performance of institutions and raising their efficiency and transparency, which proves the importance of keeping pace with technical developments in this field.
4. Artificial intelligence contributes to increased efficiency and reduced costs in accounting and auditing
5. According to statistics, future projections indicate that the application of artificial intelligence will become necessary to improve accounting and auditing practices

Answering hypotheses

Title: Artificial intelligence and digital auditing: a new era for advancing...

- ✱ **Hypothesis One:** The application of artificial intelligence contributes to improving the accuracy and efficiency of auditing and accounting processes

Table 11: shows the testing of the first hypothesis through the test ANOVA

Test ANOVA	Degree of Freedom	Calculated value	Tabular value	Significance level	The decision
1.60	47	0.168	3.20	0.05	validity of the first hypothesis

Source: Prepared by the researcher based on the outcomes of the SPSS program

Analysis of the first hypothesis:

Through thoughtful reports and respondents' answers through the questionnaire and interview, the ANOVA test in level 1.60 indicates acceptance of the first hypothesis, meaning that the artificial intelligence works to reduce human errors by a large percentage through the use of accurate algorithms, which increases the accuracy and efficiency of accounting and auditing processes, ensures transparency in financial statements, in addition to detecting fraud, and providing accurate predictions about potential risks.

- ✓ The first hypothesis is correct

- ✱ **Second hypothesis:** To overcome the challenges, digital auditing and artificial intelligence must be applied, and this requires large technical and human investments.

Table 11: shows the testing of the second hypothesis through the test ANOVA

Test ANOVA	Degree of Freedom	Calculated value	Tabular value	Significance level	The decision
1.60	47	0.168	3.20	0.05	validity of the second hypothesis

Source: Prepared by the researcher based on the outcomes of the SPSS program

Answer to the second hypothesis:

Through the studied reports and the responses of the sample members through the questionnaire and interview, the ANOVA test in level 1.60 indicates acceptance of the second hypothesis, meaning that the artificial intelligence, the application of digital auditing and artificial intelligence requires mobilizing great human, material and cultural capabilities to face the many challenges such as lack of qualified competencies, high infrastructure costs, lack of clarity of legislation regulating the use of data, and weak investments in Technology

- ✓ The second hypothesis is correct

Recommendations

- ✓ Training and training of accountants and auditors on the use of artificial intelligence and digital auditing should be provided
- ✓ To support the application of digital auditing, investment in digital technology and smart systems should be made
- ✓ Partnership and collaboration between academic and professional institutions should be strengthened to develop innovative auditing methods.
- ✓ Provide legal systems and methods to protect data and information and ensure that these technologies are used ethically and transparently.

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