Effects of Applying Artificial Intelligence Techniques on the Audit Profession and the Audit Committee: An Empirical analysis based on a Field Study

آثار تطبيق تقنيات الذكاء الاصــــطناعي على مهنة المراجعة ولجنة المراجعة: تحليل تجريبي قائم على دراسة ميدانية

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المستخلص:

تمثل الهدف الرئيســي للبحث في "تحديد وتفســير آثار تطبيق تقنيات الذكاء الاصــطناعي على مهنة المراجعة ولجنة المراجعة". ولتحقيق هذا الهدف قامت الباحثة بعرض وتصــنيف وتحليل ما ورد في الأدبيات المهنية التي تناولت موضــوعات تقنيات الذكاء الاصطناعي ومهنة المراجعة ولجنة المراجعة. وقامت بتصميم استبيان وتوزيعه على عيّنة من مجتمع الدراسة لجمع بيانات الدراسة الميدانية. تكوَّن مجتمع الدراســة من المراجعين بمكـاتب المراجعة الخـارجية، مراقبي الحســـابات بالجهاز المركزي للمحاسـبات، أعضــاء لجان المراجعة، أعضــاء هيئة التدريس والهيئة المعاونة. تكونت عيّنة الدراسة من ١١١ فردًا من هذا المجتمع. وقد تم تطبيق البرنامجين الإحصائيين G-Power وSPSS . وقد خلُصـــت إلى ما يلي:١- توجد آثار إيجابية ذات دلالة إحصــائية على مهنة المراجعة عند تطبيق تقنيات الذكاء الاصــطناعي. ٢- توجد آثار إيجابيـة ذات دلالـة إحصـــــائيـة على لجنـة المراجعـة عنـد تطبيق تقنيـات الـذكـاء الاصطناعي.

الكلــمات المفتــاحية: تقنيات الذكاء الاصطناعي- مهنة المراجعة- لجنة المراجعة – الآثار الإيجابية- الآثار السـلبية – الشــبكات العصــبية الاصــطناعية- البرامج الإحصائية G-Power وSPSS – مراقبو الحسابات- أعضـاء لجان المراجعة- الدراسة الميدانية.

Abstract:

The main objective of the research was to "identify and explain the effects of applying artificial intelligence techniques on the audit profession and the audit committee." To achieve this objective, the researcher presented, classified, and analyzed what was stated in the professional literature that dealt with the topics of artificial intelligence techniques, the audit profession, and the audit committee. And she designed a survey and distributed it to a sample of the study populations to collect data for the field study. The study population consisted of auditors in external audit offices, auditors at the Central Auditing Organization, members of audit committees, faculty members and supporting staff. The study sample consisted of 111 individuals from this population. The statistical programs, G-Power and SPSS were applied. The following was concluded: 1- There are statistically significant positive effects on the audit profession when applying artificial intelligence techniques. 2- There are statistically significant positive effects on the audit committee when applying artificial intelligence techniques.

Keywords: Artificial intelligence techniques, Audit profession, Audit committee, Positive effects, Negative effects, Artificial Neural Networks, G-Power and SPSS statistical programs, Auditors, Members of audit committees, The field study.

Section 1: The general framework of the research:
1.1 Introduction:

The technologies of artificial intelligence (AI) are critical for the future of the audit profession. These technologies are vital tools that provide audit professionals with the means necessary for increasing the effectiveness and efficiency of their jobs. The audit profession has substantially changed over time because of technological change. Many changes in this profession have already been witnessed. They include an increase in the number and sophistication of the auditing rules, numerous changes in the standards of professional ethics, an improved quality of the audit

work, growing competition among the audit firms, reduced audit fees, and the provision of new services to the customers (e.g., financial and computing advice). Additionally, this profession has witnessed the development of new audit types and services. These factors have together made the audit profession more and more competitive than ever before. Accordingly, the new methods and tools provided by information technology and AI have been widely adopted by auditors. And when AI is incorporated into the audit work, it should replace every single step in the traditional audit work and provide proper decision-making suggestions to profoundly enhance the overall financial work (**Al-Sayyed et al., 2021**). Artificial intelligence technology has impacted businesses and industries, as well as audit companies. With the emergence of AI-enhanced systems, many tasks performed by auditors can now be completed more efficiently by these technologies. Such systems are used in different audit tasks, such as risk assessment, audit planning, fraud detection, audit inquiry, transaction testing, inventory counting, and document testing. AI platforms designed for auditing provide time savings, higher efficiency and accuracy, minimized risks and biases, and improved audit quality (**Üçoğlu, 2022**). Within the auditing field, technological advancements have created numerous and significant research possibilities. As external auditors encounter increasingly sophisticated client-side systems, a new need for understanding how to give assurance on the complicated client systems while also utilizing the increasingly advanced technologies and data analytics during audit test work has emerged. As a result, to maintain a competitive edge, the audit profession is evolving by adopting AI technologies (**Noordin et al., 2022**). The role of an auditor and audit process is evolving through breakthrough innovation in artificial intelligence, big data, data analytics, and workflow automation. These developments are eliminating tedious and labor-intensive manual processes in audit and enabling auditors to powerful insights (**Dalwai et al., 2022**).

1.2 The Research Problem:

The research problem can be identified through the following questions:

1-Does applying artificial intelligence techniques affect the audit profession?

2- Does applying artificial intelligence techniques affect the audit committee?

1.3 The Research Objectives:

The research objectives are as follows:

1-Identify and explain the effects of applying artificial intelligence techniques on the audit profession.

2-Identify and explain the effects of applying artificial intelligence techniques on the audit committee.

Section 2: Theoretical Framework and Literature Review:

In this section, the researcher discusses what is meant by artificial intelligence, artificial intelligence techniques, related research on artificial intelligence techniques and the audit profession, related research on artificial intelligence techniques and the audit committee.

2.1 Artificial Intelligence (AI):

Some studies focused on clarifying the concept of artificial intelligence and its benefits. For example, the study **(Shaw,2019)** indicated that artificial intelligence refers to systems that can be designed to take cues from their environment and based on those inputs, proceed to solve problems, assess risks, make predictions, and take actions. In the era predating powerful computers and big data, such systems were programmed by humans and followed the rules of human invention. The study **(Munoko et al.,2020)** defined AI as an emerging technology that aims to mimic the cognitive skills and judgment of humans and promises competitive advantages to adopters. Accounting firms are reporting the use of artificial intelligence in their auditing and advisory functions, citing benefits such as time savings, faster

data analysis, increased levels of accuracy, more in-depth insight into business processes, and enhanced client service. As a result, all the Big 4 firms are reporting its use and their plans to continue with this innovation in areas such as audit planning risk assessments, tests of transactions, analytics, and the preparation of audit workpapers, among other uses. The study **(Hasan,2021)** showed that artificial intelligence is a pair of words that excites both the dilettante and cognoscente of the AI community all the same. The concept of a man-made machine or sentient being able to think, learn, and make decisions on its own is so awe-inspiring that it has taken place in popular culture for decades.

2.2 Artificial Intelligence techniques:

In the domain of auditing, predicting audit opinions is a crucial task to ensure accurate financial reporting and regulatory compliance. To this end, various data mining techniques have been employed to develop effective prediction models that can assist auditors in making informed decisions. This section depicts three widely used data mining techniques, namely Support Vector Machines (SVM), Artificial Neural Networks (ANN), and K-Nearest Neighbor (KNN), for predicting audit opinions. Each of these techniques offers unique advantages and can be adapted to different types of data and contexts. By understanding the strengths and limitations of each approach, auditors can make better use of predictive analytics in their work and enhance the quality of their auditing outcomes **(Singh et al.,2023).**

2.2.1 Support Vector Machines:

Support Vector Machines (SVM) are a popular method for classification modeling, that is widely used in data analysis for both regression and classification tasks. SVM is based on statistical learning theory, making it a reliable tool for examining data mathematically. It uses a linear optimal hyperplane to split the data into two classes with the maximum margin between the hyperplane and the nearest point. SVM maps input vectors into a high-dimensional characteristic distance through nonlinear transformation, making it effective in solving complex problems.

One of the main advantages of SVM is that it is optimal, unique, and universal. This is because the SVM solution is achieved by resolving the linearly constrained quadratic issues. Another advantage is that it is based on the principle of structural risk reduction, which reduces the upper bound of the actual risk. This sets SVM apart from other classifiers that only reduce the empirical risk. Due to these advantages, SVM has been widely used in many areas, and its application and theory have been extensively studied. SVM has proven to be successful in various financial applications, including time series prediction, insurance fraud detection, and credit rating. Previous studies have shown that SVM's performance in these areas is comparable to, or even better than, other traditional classifiers such as logistic regression and discriminate analysis **(Singh et al.,2023).**

2.2.2 Artificial Neural Networks:

Artificial Neural Network is a branch of artificial intelligence. Neural Networks are considered major soft-computing technologies and have been extensively studied and applied during the last two decades. The most general applications where neural networks are most widely used for problem solving are pattern recognition, data analysis, control, and clustering. Artificial Neural Networks have abundant features, including high processing speeds and the ability to learn the solution to a problem from a set of examples **(Kumar & Thakur,2012).** Artificial Neural Networks (ANN) are algorithmic mechanisms based on the human brain system capable of modeling non-linear statistical data in massive volumes. It is composed of simple handling units called neurons that work in vast parallel dispensers. Each communication is connected with a numeral value summon weight, and the output unit of ANN picks the weighted totality of the outputs from units in a former stratum. The information fed from the input nodes travels through a concealed layer and reaches the output nodes. This hierarchical arrangement can be flexibly fine-tuned by altering the weights in the previous layers to improve the ranking

model's performance. One of the advantages of ANN is that it can be used to detect underlying functional relevance between inputs and outputs and can perform tasks like classification, control, pattern recognition, modeling, evaluation, and prediction. ANN is particularly useful when employed to calculate accurate solutions for noisy, complex, irrelevant, or partial data. The process involves utilizing interplays among multiple variables that exhibit substantial correlation, often deemed as nonlinear, poorly related, and intricate to depict using statistical techniques **(Singh et al.,2023).** Artificial Neural Networks are designed in the same way as the human brain, with neuron nodes interconnected in a web-like fashion. Neurons are billions of cells that make up the human brain. Each neuron is made up of a cell body that processes information by bringing it to and from the brain (inputs and outputs) **(Dastres & Soori,2021).**

2.2.3 K-Nearest Neighbor:

KNN is a method of classifying objects based on learning data that is closest to the object. This method aims at classifying new objects based on attributes and training samples. Given a query point, it will find a number of K objects or training points closest to the query point. The predicted value of the query will be determined based on the neighbor classification. Before performing calculations using the K-Nearest Neighbor method, the training and test data must first be determined. Then the calculation process will be carried out to find distances applying the Euclidean distance formula. It is a very simple technique that is easy to implement. Similar to clustering techniques, group new data based on their distance to some of the closest data/neighbors. The similarity function will produce a value determining whether there are similarities between the new cases and those in the case base. To determine the similarity can be done with several functions, i.e., with the similarity euclidean distance function. The disadvantage of this Euclidean distance function is that if one attribute input has a relatively large range, it can defeat other attributes **(Lubis, A. & Lubis, M,2020).** The K-Nearest Neighbor

(KNN) technique is a widely used algorithm in the field of financial and accounting studies. It works by analyzing objects with N characteristics in N distance space, where each object is considered as one spot. KNN then introduces a resemblance metric for each object and classifies new items by comparing them with existing ones, utilizing distance measurement. The algorithm calculates the distance between every item in a sampling set and determines the closest K neighbors to the unknown observation. The K cases are then used to classify the new observation by specifying it as the most popular class. KNN is a significant classifier algorithm employed in fraud detection. The researchers assessed the effectiveness of the KNN algorithm in strengthening reviewers' views compared to methods that use logical and discriminant analysis **(Singh et al.,2023).**

2.3 Related research on artificial intelligence techniques and the audit profession:

Many studies have focused on artificial intelligence and auditing. For example, a study **(Munoko et al., 2020)** examined the current and potential uses of AI in auditing. It was clear that the prospects of emerging technology are highly promising for the profession. AI can increase efficiencies, provide greater insight into business processes, and create competitive advantages for adopters. However, there are some ethical concerns with the technology, which, if left unresolved, could negate the anticipated benefits. Due to AI's unique features, such as its intelligence, data retrieval, and complexity, the ethical issues laid out could emerge. These issues increase in magnitude when AI artifacts grow in sophistication, progressing from assisted AI to autonomous AI. The study **(Seethamraju & Hecimovic,2020)** showed that artificial intelligence, assisted by massive processing power and big data, is poised to influence the audit profession, but empirical evidence is sketchy. This exploratory cross-sectional qualitative field study, using the Technology-Organization-Environment (TOE) framework as its broad theoretical lens and semi-structured interviews as the data

collection strategy, investigated the adoption of artificial intelligence in auditing and identified the factors influencing the adoption. Adoption of AI by auditing firms, the study found, would not only result in improvements in audit quality and decision-making but also help them build capabilities to deliver value-adding AI consultancy services that are more profitable than traditional auditing. Apart from improving audit quality, challenges auditing firms face include the conservative approach of external regulatory bodies, the inability to document the use of technology for verification by regulators, and the perceived legal and reputational risk of financial auditing work that limits the potential use of AI. The descriptive study (**Albawwat & Frijat, 2021**) examined whether perceived ease of use, usefulness, and contribution to audit quality vary by AI system types (assisted, augmented, and autonomous). An online questionnaire was used to collect data from 124 auditors representing local audit firms in Jordan. The results indicated that auditors perceive assisted and augmented AI systems as easy to use in auditing while perceiving autonomous AI systems as complicated to use. Besides, auditors are underestimating autonomous AI systems' capabilities and perceive them as not useful for auditing. The results also revealed a significant difference between the perceived contribution to audit quality of the three AI system types. The purpose of the study (**Al-Sayyed et al., 2021**) was to explore the impact of intelligence on audit evidence and the acquisition of skills and knowledge. In this study, the primary source was based on a questionnaire conducted by noncertified auditors at IT companies in Jordan. Based on the findings of the study, the researchers recommended the following: 1. Increased interest in artificial intelligence technologies by audit offices operating in Jordan since they are practically important in improving the collection of audit evidence. 2. Emphasize the importance of using neural networks in mathematical models of audit guides formulated in diagrams that mimic the qualities found in computer systems. 3. The importance of relying on the use of smart software to

develop the process of collecting and reformulating audit evidence in the form of computer-embraced software for its role in improving the quality of the audit process. 4. Make better use of neural networks, especially regarding providing solutions and the reasons behind these solutions and recommendations to the user in a clear and accurate form about the audit guides. The study **(Hasan, 2021)** showed that anything that can be turned into data, according to some technology analysts, will eventually be taken over by machines. That leaves imagination and judgment, which are human-only domains and are frequently what distinguish one organization from another. AI, like spreadsheets and databases, is a tool that is only valuable if people know how to use it to streamline business processes. Accountants and auditors cannot be replaced by artificial intelligence when it comes to exercising human creativity and judgment. Technological, regulatory, and economic shifts will continue to test the profession's historical approaches and ways of thinking, which is a good thing. The market's response to these changes will ultimately influence how audits are carried out. Accountants and auditors must be able to respond quickly to changes in user demand as well as the creation of new and emerging metrics of organizational performance beyond traditional financial statements. The essential concept at the heart of auditing—enhancing information confidence—will remain unchanged. However, as technology and analytics continue to advance, the way engagement teams perform audits will change. Auditors' capacity to exercise judgment and professional skepticism will be more vital than ever as they use new technologies. The study **(Fedyk et al.,2022)** investigated whether artificial intelligence impacts audit quality and efficiency by leveraging a unique dataset of more than 310,000 detailed individual resumes for the 36 largest audit firms to identify audit firms' employment of AI workers. The results showed that investing in AI helps improve audit quality, reduces fees, and ultimately displaces human auditors, although the effect on labor takes several years to materialize. The empirical analyses were

supported by in-depth interviews with 17 audit partners representing the eight largest U.S. public accounting firms, which show that (1) AI is developed centrally; (2) AI is widely used in audit; and (3) the primary goal for using AI in audit is improved quality, followed by efficiency. The study **(Noordin et al., 2022)** aimed to explore external auditors' perceptions of the use of artificial intelligence in the United Arab Emirates (UAE). It investigated whether there is a perception among external auditors toward the contribution of AI to audit quality. It also aimed to test whether the perception of AI usage and its impact on audit quality differs between local and international external auditors. The study tested the following hypotheses: **H1.** There is a perception of external auditors in the UAE that using AI contributes to audit quality. **H2.** The perceived contribution of AI usage to audit quality significantly differs between local and international external auditors in the UAE. Data was collected using an online survey from 22 local and 41 international audit firms to achieve these study objectives. Participants were either the auditing manager, audit partners, senior auditors, or other personnel who may have experience in the field of accounting and auditing. To test the hypotheses, data analysis was undertaken using reliability and validity tests, descriptive analysis, and an independent sample t-test. It found that the analysis shows that there is a non-significant difference in the perceived contribution of AI to audit quality between local and international audit firms. All the audit firms, whether local or international, have equal perceived contributions regarding audit quality. The study **(Saad, 2021)** discussed the impact of using artificial intelligence on improving the quality of audit professional performance, the impact on increasing the ability to perform complex auditing process, and the impact on improving the efficiency of audit. The study provided a group of aims to measure the effect of implementing artificial intelligence on audit process quality, and how each element can affect the effectiveness of the application, as well as measuring the effect of factors together on the

effectiveness of the application, with the aim of reaching realistic results on actual practices in the firms. The study had a theoretical framework for all variables. The theoretical framework found that there is a significant relationship between the use of artificial intelligence and the quality of the audit process, and there is a significant relationship between the use of artificial intelligence and performing complex audit process, there is a significant relationship between the use of artificial intelligence and the audit process efficiency. The sample of this study is represented by a group of auditors in the State of Palestine. The field study concludes that there is a significant and positive relationship between using artificial intelligence and improving the quality of audit professional performance, there is a significant and positive relationship between using artificial intelligence and increasing the ability to perform complex auditing process, and there is a significant and positive relationship between using artificial intelligence and improving the efficiency of audit. And it is recommended that to succeed in implementing artificial intelligence, firms should do training for employees, auditors can capture and ingest greater amounts of information, and analyze a broader range of data formats. And it is recommended that firms use artificial intelligence techniques in reviewing the quality of auditing and related to the professional care, management of internal audit activities, evaluation of risk management, planning and implementation of the audit process, and focusing on artificial intelligence techniques for their importance in the development of internal audit.

2.4 Related research on artificial intelligence techniques and the audit committee:

A few studies have discussed the topic of artificial intelligence techniques and the audit committee. For example, the study **(Dheeriya & Singhvi, 2021)** stated that the role of audit committees took on significant importance after the passage of the Sarbanes-Oxley Act of 2002, and due to advances in machine learning technology in recent years, artificial intelligence is

becoming an increasingly viable replacement for human labor across a wide domain of business operations traditionally thought to be safe from the ever-widening reach of automation. It argues that one such function that may be an increasingly fitting candidate for such automation is the audit committee. In recent years, however, several shortcomings among prominent companies with regards to financial reporting quality have highlighted the weaknesses of audit committees and eroded billions in shareholder wealth. It offers a solution to the increasing problem of the audit committee's ineffectiveness in the modern business environment by proposing that the functions of the audit committee be delegated to artificial intelligence infused bots. It believes that such a system would have notable policy implications for shareholders, investors, regulators such as the SEC, and society at large. The study **(Lindsay, 2022)** showed that audit committees play a vital role in the financial reporting system through their oversight of financial reporting, including the audit of the company's financial statement and internal control over financial reporting performed by the external auditor. Increasingly, audit committees are also responsible for overseeing other areas of corporate reporting, such as cybersecurity, environmental, social, and governance (ESG), and other non-generally accepted accounting principles information. Given the increasing scope of oversight, how audit committees manage and disclose these responsibilities is an important consideration in today's environment. This was confirmed by a study **(Cassidy et al.,2023)** the audit committee has many discrete duties, including overseeing financial reporting and related internal controls, the independent and internal auditors, and ethics and compliance, to name just a few. However, these and other duties are part of a broader audit committee responsibility: risk oversight. While the audit committee does not manage all risks, it is responsible for overseeing the procedures and processes by which the company anticipates, evaluates, monitors, and manages risks of

all types. Recent developments in artificial intelligence, including the emergence of generative AI, are leading businesses to evaluate AI's potential impact on their business technology strategy. As businesses expand their use of AI, especially into core business processes, the audit committee will need to understand the challenges and opportunities presented by AI to address risks related to governance and stakeholder trust. The study **(Forde,2023)** confirmed that while AI transformation is a part of the larger digital change, it's taking on a life of its own. Just because a company can adapt to digital doesn't mean it's ready for AI; it's a different game. There are many more considerations, and it requires a different approach. AI will change how we think—not just how we work. While many people are excited about the possibilities of artificial intelligence, audit committees need to think bigger. As we see more advances like generative AI and powerful language models, they will need to look at data quality, rethink how intellectual property is viewed, understand stakeholder impacts, and prepare for upcoming regulations. "Audit committee members should develop and implement a comprehensive and consistent framework and methodology for auditing AI models that covers the entire AI lifecycle, from data collection and preparation to model development and deployment to model maintenance and update. The framework and methodology should also define the objectives, criteria, standards, procedures, and tools for auditing AI models, as well as the roles and responsibilities of the auditors and the auditees. And audit committee members should seek and maintain regular and constructive engagement with the AI experts and stakeholders, both internal and external, such as the AI developers, users, managers, regulators, or customers, to understand their perspectives, expectations, and concerns regarding the AI models, as well as to solicit their feedback, input, or support for the audit process. The engagement should also involve education and awareness-raising on the benefits and risks of AI, as well as the audit findings and recommendations

(Klein,2023). The study **(Lawrence et al., 2023)** reported that public company board audit committees are responsible for identifying, monitoring, and assessing financial, legal, and regulatory risks. An audit committee could determine that these include generative AI risks. Over time, the audit committee can determine whether its oversight of generative AI risks should be formalized into modified guidelines or charters for itself or recommend similar steps for other board committees. At a minimum, audit committees will want to work closely with a company's independent auditors to understand how generative AI is being used in the preparation and auditing of financial statements and with management in connection with generative AI's role and impact on the company's system of internal controls.

According to the above, the researcher concluded the following:

1- AI is an emerging technology that aims to mimic the cognitive skills and judgment of humans.

2- Accounting firms are reporting the use of artificial intelligence in their auditing and advisory functions.

3- There are three widely used data mining techniques, namely Support Vector Machines (SVM), Artificial Neural Networks (ANN), and K-Nearest Neighbor (KNN), for predicting audit opinions.

4- Some literature has addressed the benefits and pros of applying artificial intelligence techniques in the field of auditing.

5- A few studies have addressed the pros and cons of applying artificial intelligence techniques in the field of auditing.

6- A few studies have addressed the effects of applying artificial intelligence techniques on the audit committee.

7- Through this research, the researcher seeks to combine the pros and cons, and the effects of applying artificial intelligence techniques on the audit profession in general, and on the audit committee in particular.

2.5 The Research Hypotheses:

According to the foregoing, the research hypotheses can be developed as follows:

Hypothesis 1: "There are no statistically significant positive effects on the audit profession when applying artificial intelligence techniques.".

Hypothesis 2: "There are no statistically significant positive effects on the audit committee when applying artificial intelligence techniques.".

Section 3: Effects of applying artificial intelligence techniques on the audit profession:

According to the theoretical background of the research and the results of the field study, the researcher concluded the following:

1- Applying artificial intelligence techniques has positive effects on the audit profession through the following, arranged according to their importance and degree of effect:

- Artificial intelligence platforms designed for auditing provide time savings, higher efficiency and accuracy, minimize risks and biases, and larger data coverage.
- These techniques are vital tools that provide auditors with the means necessary for increasing the effectiveness and efficiency of their jobs.
- Implementing artificial intelligence techniques results in faster data analysis, increased levels of accuracy, more in-depth insight into business processes, and enhanced clients' service.
- Artificial intelligence adds considerable advancement to analysis because of the exponential amount of scope and depth of data available.
- Many tasks performed by auditors can be completed more efficiently by using artificial intelligence techniques.

−Applying artificial intelligence techniques helps in audit planning, risk assessments, tests of transactions, analytics, and the preparation of audit work papers.

−Applying artificial intelligence techniques can augment audit quality by providing more evidence and reducing bias.

−Auditors' capacity to exercise judgment and professional skepticism will be more vital than ever as they use artificial intelligence techniques.

−Applying artificial intelligence techniques improves the collection of audit evidence.

−The provision of new services to the customers (e.g., financial and computing advice).

−Artificial intelligence is used in analytics to identify financial misstatements or fraud detection.

−The traditional audit stages will either disappear or merge with other stages because of applying artificial intelligence techniques.

2-It has also been shown that there are negative effects of artificial intelligence techniques on the audit profession through (The largest frequency is a negative effect):

−Potential exposure to cybersecurity risks.

−Lack of skills and deprofessionalization.

From the above, it was concluded that artificial intelligence techniques have positive effects on the auditing profession, but they face obstacles in their application, represented by a lack of skills and deprofessionalization, in addition to the possibility of exposure to cybersecurity risks.

Section 4: Effects of applying artificial intelligence techniques on the audit committee:

According to the theoretical background of the research and the results of the field study, the researcher concluded the following:

1- Applying artificial intelligence techniques has positive effects on the audit committee through the following, arranged according to their importance and degree of effect (The largest frequency is a positive effect):

- Artificial intelligence adds considerable advancement to analysis because of the exponential amount of scope and depth of data available, which is an important part of risk management and decision-making for the audit committee. AI can help audit committee members to better oversee and govern the AI initiatives and activities within the company.

- Audit committees must watch for changes in how information is treated and assess the implications for controls, processes, data, and reporting.

- AI can enable audit committee members to broaden the scope and value of their audit function beyond traditional financial reporting and internal control to cover other areas of corporate reporting, such as cybersecurity or other non-GAAP information.

- Audit committees will have to recruit new members with specialized AI knowledge.

- The responsibilities of the AC are increasing exponentially and require automated help from technology.

- Applying AI techniques leads to a universal refresh of what the audit committee (AC) needs and how they are sourcing the committee members.

- Applying AI techniques leads to a review of audit committee composition and membership to confirm that it encompasses the knowledge and experience needed to be effective.

- Applying AI techniques leads to filling AC seats with directors who have "financial expertise, acting, auditing, and industry expertise.

- Artificial intelligence eliminates the audit committee's collective bias in the decision-making process.

2- It has also been shown that there are negative effects of artificial intelligence techniques on the audit committee through (The largest frequency is a negative effect):

–Artificial intelligence techniques can replace audit committee members.

–The functions of the audit committee will be delegated to artificial intelligence infused bots.

From the above, it was concluded that artificial intelligence techniques have positive effects on the audit committee, but they have negative effects in their application, represented by the belief that artificial intelligence techniques can replace members of the audit committee, and the functions of the audit committee will be delegated to artificial intelligence infused bots.

Given the results of the field study, in the opinion of some, the great challenge for using artificial intelligence techniques is the need for the knowledge and skill required to use these techniques on the one hand and benefit from their outputs in the review process on the other hand. Artificial intelligence in the auditing profession is one of the supporting factors, and references and consultations with those with accounting knowledge are indispensable. Artificial intelligence techniques do not replace the audit committee, but they influence the skills required to deal with the outputs and the new work environment. And it has been suggested that adequate insurance and protection are necessary.

Section 5: The Field Study:

5.1 Introduction:

The field study deals with the description of both the study population and sample, as well as the questionnaire used in collecting data, and the methods of preparing and distributing it to the study sample. It also covered tests of its validity and reliability. It also included the statistical methods that were used

in analyzing the data and testing the hypotheses, ending with the results obtained from the study. The questionnaire questions were derived from studies related to the research topic.

5.2 The Field Study Objectives:

The field study aims to achieve the following:

1-Identify and explain the effects of applying artificial intelligence techniques on the audit profession.

2- Identify and explain the effects of applying artificial intelligence techniques on the audit committee.

5.3 Population and Sample of the Study:

The study population includes those interested in the auditing profession, as follows:

-Auditors in external audit offices.

-Auditors at the Central Auditing Organization.

-Members of audit committees.

-Faculty members and supporting staff to benefit from scientific, research and academic expertise in the field of study.

The study sample consisted of 111 individuals from the study population mentioned above, and we used the G*Power program to estimate the sample size according to the following parameters:

- Type of power analysis: Compute the required sample size – given α, power, and effect size.

- Effect Size: $\rho = 0.3$, as it is considered the moderate effect size, since effect size conventions:

$\rho = 0.10$ – Small.

$\rho = 0.30$ – Median.

$\rho = 0.50$ – Large.

- Alpha α (first-type error) = 0.05 (probability of rejecting the null hypothesis when it is true), i.e., with a confidence level of 0.95, as the confidence level is (1-α).

- Test Power (1-β) = 0.95, where β represents the error of the second type (the probability of accepting the null hypothesis, which is wrong), and based on the previous determinants, the program determined the appropriate sample size, which is 111 individuals selected from the study population.

The following figure shows the determination of the sample size according to the G*Power Program:
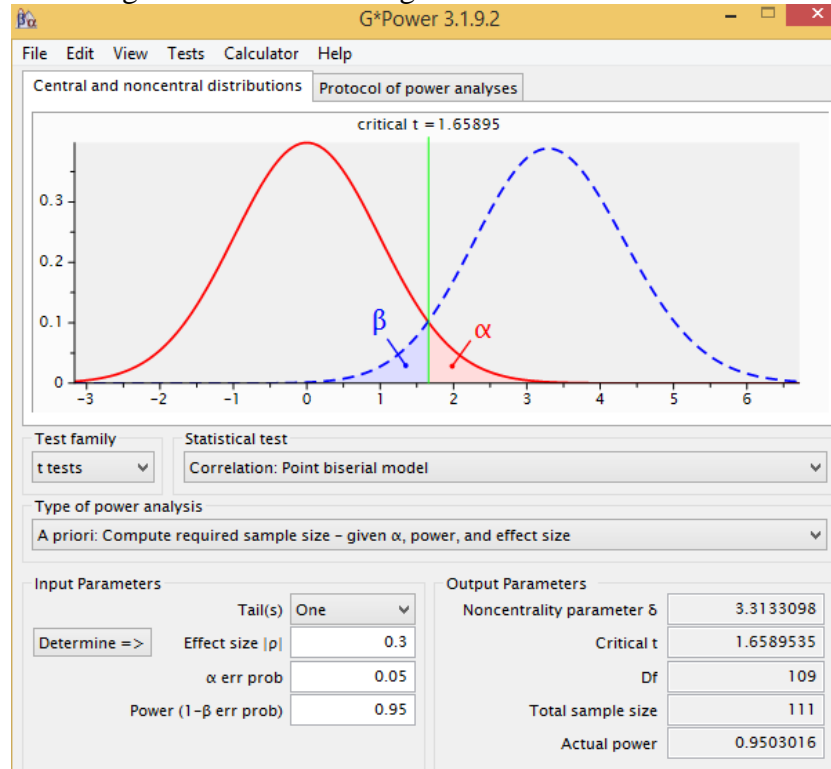
Figure (1)
The determination of the sample size according to the G*Power Program

The electronic method was used through Microsoft Forms, where the questionnaires were sent to the sample electronically, and then responses were received, reviewed, and analyzed.

5.4 Preparing the questionnaire:

The researcher prepared a questionnaire to collect field study data, and it was designed in a way that leads to achieving the objectives of the study and helps in testing its hypotheses. The

survey included demographic data, and two research dimensions, as follows:

Demographic data includes qualification, position, and experience length.

Dimension 1: The effect of applying artificial intelligence techniques on the audit profession (14 phrases).

Dimension 2: The effect of applying artificial intelligence techniques on the audit committee (12 phrases).

5.5 Steps of statistical analysis:

1.The researcher designed a survey form that is consistent with the purposes of the research and helps to test the hypotheses of the study. It included demographic data and two research dimensions representing the previously mentioned study dimensions.

2. The researcher has given weight to the responses as follows:

Negative effect	No effect	Positive effect
-1	0	1

3- It used the SPSS statistical program.

4- The data was analyzed, and we obtained conclusions.

5.6 Statistical analysis used (methodology):

Data reliability and validity were tested for statistical analysis to determine the possibility of generalizing the results obtained from the sample to the study population, describe the variables, and finally test hypotheses, leading to the findings as follows:

5.6.1   Internal Consistency: by calculating the Spearman correlation coefficient of each phrase in the axis with the total score of the axis that the phrase belongs to.

5.6.2   Reliability Test: through the scale (alpha) Cronbach's Alpha to the axis of the questionnaire, to find out the possibility of generalizing the results obtained from the sample to the population study.

5.6.3 **Frequency Tables:** It used frequency tables to describe the demographic characteristics of the sample and determine the relative weights of responses to the questions in the questionnaire.

5.6.4 **Chi square test:** to test if the sample responses on categories of a question are equal (Positive effect, Negative effect, no effect,), the null and alternative hypotheses are formulated as follows:
-Null hypothesis H_0: the responses on categories are equal.
-Alternative hypothesis H_1: the responses on categories are not equal.

The decision is made according to a significant level, or P-value. If the P-value is greater than or equal to 0.05, the null hypothesis cannot be rejected, and if the P-value is less than 0.05, the null hypothesis can be rejected. If the null hypothesis is rejected, the result will be in favor of the highest frequency.

5.6.5 **One sample T- test:** Using zero as a test value, the null and alternative hypotheses can be formulated as follows:
H_0: $\mu = 0$ i.e., the mean is not significantly different from 0 (meaning that the variable has no significant effect).
H_1: $\mu \neq 0$ i.e., the mean significantly different from 0 (meaning that the variable has a significant effect).
The decision is made according to a significant level, or P-value. If the P-value is greater than or equal to 0.05, the null hypothesis cannot be rejected, and if the P-value is less than 0.05, the null hypothesis can be rejected. If the null hypothesis is rejected, there are two cases:
1-When the value of T is positive, then the mean response of the variable is greater than the value 0, and then there is a positive effect of the variable.2-When the value of T is negative, then the mean response of the variable is less than the value 0, and then there is a negative effect of the variable.

5.7 Statistical analysis and testing hypotheses:
The statistical analysis includes the demographic characteristics of the sample, internal consistency and reliability analysis, and testing hypotheses.

5.7.1 The demographic characteristics of the sample:
Identify the characteristics of the sample in terms of qualification, position, and experience length to ensure that the sample includes the target categories in a way that ensures the proper distribution of the sample and its ability to complete the survey list accurately and objectively. The following table illustrates these characteristics:

Table (1)
Demographic characteristics of the sample

Demographic Characteristics	Value	Frequency	%
Qualification	Bachelor's	31	27.9
	Postgraduate diploma	5	4.5
	Master's	15	13.5
	Ph.D.	60	54.1
Position	Auditors in external audit offices.	27	24.3
	Auditors at the Central Auditing Organization.	22	19.8
	Members of audit committees.	4	3.6
	Faculty members and supporting staff.	58	52.3
Experience Length	Less than 5 years	18	16.2
	From 5 to less than 10 years	18	16.2
	From 10 to less than 15 years	19	17.1
	From 15 years and more	56	50.5
Total		**111**	**100**

Table (1) shows that:

-**Distribution of the sample according to qualification:**

The largest percentage are those holding a "Ph.D." represent 54.1%, i.e., more than half of the sample, followed by those holding a "Bachelor's degree", represents 27.9% of the total sample, followed by those holding a "Master's degree" represents 13.5%, and then those holding a "Postgraduate diploma" represents 4.5%, which confirms that the sample is adequately qualified to complete the questionnaire and answer its questions accurately and objectively.
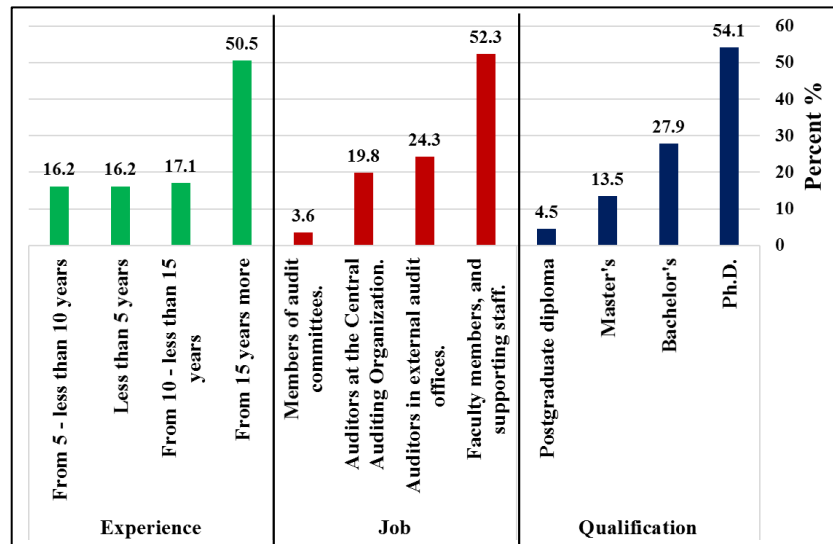
-**Distribution of the sample according to Position:**

The largest percentage were "Faculty members and supporting staff," with a percentage of 52.3%, i.e., more than half of the sample, followed by "Auditors in external audit offices," with a percentage of 24.3%, "Auditors at the Central Auditing Organization," with a percentage of 19.8%, and "Members of audit committees," with a percentage of 3.6%. This indicates that the sample includes all the targeted categories appropriate to the research topic.

-**Distribution of the sample according to experience length:**

It was found that the largest percentage of the sample was in the category of years of experience "From 15 years and more," with a percentage of 50.5%, more than half of the total sample, followed by the category "from 10 – less than 15 years," with a percentage of 17.1%, then the categories "From 5 – less than 10 years" and "Less than 5 years," with a percentage of 16.2% for each category. This indicates that the experience length of the sample is sufficient to complete the questionnaire accurately and objectively.

The following figure declares the distribution of the sample according to demographic characteristics:

Figure (2)
The distribution of the sample according to demographic characteristics

5.7.2 Internal consistency and reliability:

Include measures of the validity and reliability of the content of the study variables, the validity of the questionnaire in terms of the validity of the scale (internal consistency), and the reliability scale, and the following are the results of those tests:

5.7.2.1 Internal consistency for "The effect of applying artificial intelligence techniques on the audit profession":

The following table shows the Spearman correlation coefficient between the phrases of "The effect of applying artificial intelligence techniques on the audit profession" and the overall mean of the dimension that phrases belong to:

Table (2)

The Spearman correlation coefficient between the phrases of the effect of applying artificial intelligence techniques on the audit profession and the overall mean of the dimension that phrases belong to

No.	The Spearman Correlation Coefficient	Validity coefficient	No.	The Spearman Correlation Coefficient	Validity coefficient
1	.531**	0.694	8	.426**	0.597
2	.471**	0.640	9	.346**	0.514
3	.344**	0.512	10	.457**	0.627
4	.428**	0.599	11	.509**	0.675
5	.311**	0.474	12	.438**	0.609
6	.350**	0.519	13	.502**	0.668
7	.570**	0.726	14	.371**	0.541

** The correlation is significant at the 0.01 level. No. represents "The number of the phrase in the questionnaire." Validity coefficient = 2*R / (1+R), where R is the Spearman correlation coefficient.

Table (2) shows that the Spearman correlation coefficients shown ranged between 0.311 and 0.570 and that they are all positive and significant at the level of significance $\alpha = 0.01$, which was reflected in the validity coefficients, as they ranged between 0.474 and 0.726, and thus the dimension is considered true to what was set to measure it.

5.7.2.2 Internal consistency for "The effect of applying artificial intelligence techniques on the audit committee":

The following table shows the Spearman correlation coefficient between the phrases of the availability of the elements of "The effect of applying artificial intelligence techniques on the

audit committee" and the overall mean of the dimension that phrases belong to:

Table (3)

The Spearman correlation coefficient between the phrases of the effect of applying artificial intelligence techniques on the audit committee and the overall mean of the dimension that phrases belong to

No.	The Spearman Correlation Coefficient	Validity coefficient	No.	The Spearman Correlation Coefficient	Validity coefficient
1	.593**	0.745	7	.464**	0.634
2	.567**	0.724	8	.440**	0.611
3	.606**	0.755	9	.485**	0.653
4	.442**	0.613	10	.478**	0.647
5	.467**	0.637	11	.544**	0.705
6	.455**	0.625	12	.441**	0.612

** The correlation is significant at the 0.01 level. No. represents "The number of the phrase in the questionnaire." Validity coefficient = 2*R / (1+R), where R is the Spearman correlation coefficient.

Table (3) shows that the Spearman correlation coefficients shown ranged between 0.440 and 0.606 and that they are all positive and significant at the level of significance $\alpha = 0.01$, which was reflected in the validity coefficients, as they ranged between 0.611 and 0.755, and thus the dimension is considered true to what was set to measure it.

5.7.2.3 Reliability Analysis:

The reliability measure illustrates the possibility of generalizing the results obtained from the sample on the population. Through the scale of Cronbach's Alpha, the value of Alpha ranges between zero and one, if there is no stability in the data, the value of this parameter is equal to zero; on the contrary, if there is complete stability in the data, the value of this

parameter is equal to one, and if this measure has equaled or increased from 0.60, then it is possible to rely on the results of the study and generalize the results on the population.

Table (4)
Reliability Scales for the Study Axis

Dimension	No. of phrases	Alpha Reliability Coefficient	Honesty Coefficient[1]
The effect of applying artificial intelligence techniques on the audit profession.	14	0.737	0.858
The effect of applying artificial intelligence techniques on the audit committee.	12	0.763	0.873

[1]   The honesty coefficient is the square root of the reliability coefficient. It is clear from the table that the (stability coefficient) alpha values amounted to 0.737, and 0.763 on the two dimensions of the survey respectively, which was reflected in the honesty coefficients as they amounted to 0.858, and 0.873 on those dimensions, which indicates that the responses have a high level of reliability.

5.7.3 Testing Hypotheses:

5.7.3.1 Testing Hypothesis 1: "There are no statistically significant positive effects on the audit profession when applying artificial intelligence techniques.". To test this hypothesis, the frequency table, Chi square test, and one sample t-test were applied to the dimensions of the questionnaire, and the following results were obtained:

Table (5)
Frequency table and Chi square test for the effect of applying artificial intelligence techniques on the audit profession

Phrases		Negative Effect	No Effect	Positive Effect	Chi square	Sig.
1- Many tasks performed by auditors can be completed more efficiently by using artificial intelligence techniques.	#	7	6	98	150.9	0.000
	%	6.3	5.4	88.3		
2- The traditional audit stages will either disappear or merge with other stages because of applying artificial intelligence techniques**.**	#	14	14	83	85.8	0.000
	%	12.6	12.6	74.8		
3-Auditors' capacity to exercise judgment and professional skepticism will be more vital than ever as they use artificial intelligence techniques.	#	9	13	89	109.8	0.000
	%	8.1	11.7	80.2		
4- These techniques are vital tools that provide auditors with the means necessary for increasing the effectiveness and efficiency of their jobs.	#	7	2	102	171.6	0.000
	%	6.3	1.8	91.9		
5- Artificial intelligence platforms designed for auditing provide time savings, higher efficiency and accuracy, minimize risks and biases, and larger data coverage.	#	4	4	103	176.6	0.000
	%	3.6	3.6	92.8		
6- Applying artificial intelligence techniques helps in audit planning, risk assessments, tests of	#	4	10	97	146.4	0.000

Phrases		Negative Effect	No Effect	Positive Effect	Chi square	Sig.
transactions, analytics, and the preparation of audit work papers.	%	3.6	9.0	87.4		
7-Applying artificial intelligence techniques improves the collection of audit evidence.	#	12	12	87	101.4	0.000
	%	10.8	10.8	78.4		
8- Applying artificial intelligence techniques can augment audit quality by providing more evidence and reducing bias.	#	6	10	95	136.6	0.000
	%	5.4	9.0	85.6		
9- Lack of skills and deprofessionalization.	#	58	29	24	18.2	0.000
	%	52.3	26.1	21.6		
10- Potential exposure to cybersecurity risks.	#	60	10	41	34.4	0.000
	%	54.1	9.0	36.9		
11- Artificial intelligence is used in analytics to identify financial misstatements or fraud detection.	#	11	14	86	97.5	0.000
	%	9.9	12.6	77.5		
12- Implementing artificial intelligence techniques results in faster data analysis, increased levels of accuracy, more in-depth insight into business processes, and enhanced clients' service.	#	6	5	100	160.9	0.000
	%	5.4	4.5	90.1		
13-The provision of new services to the customers (e.g., financial and computing advice).	#	11	13	87	101.4	0.000
	%	9.9	11.7	78.4		
14-Artificial intelligence adds considerable advancement to	#	6	6	99	155.8	0.000

Phrases		Negative Effect	No Effect	Positive Effect	Chi square	Sig.
analysis because of the exponential amount of scope and depth of data available.	%	5.4	5.4	89.2		

- It is clear from Table (5) that applying artificial intelligence techniques has positive effects on the audit profession through the following, arranged according to their importance and degree of effect (The largest frequency is a positive effect):

− Phrase 5: "Artificial intelligence platforms designed for auditing provide time savings, higher efficiency and accuracy, minimize risks and biases, and larger data coverage", *"Chi square = 176.6, Sig. <0.01";* and *92.8%* of the sample response that this is a positive effect.

− Phrase 4: "These techniques are vital tools that provide auditors with the means necessary for increasing the effectiveness and efficiency of their jobs", *"Chi square = 171.6, Sig. <0.01";* and *91.9%* of the sample response that this is a positive effect.

− Phrase 12: "Implementing artificial intelligence techniques results in faster data analysis, increased levels of accuracy, more in-depth insight into business processes, and enhanced clients' service", *"Chi square = 160.9, Sig. <0.01";* and *90.1%* of the sample response that this is a positive effect.

− Phrase 14: "Artificial intelligence adds considerable advancement to analysis because of the exponential amount of scope and depth of data available", *"Chi square = 155.8, Sig. <0.01";* and *89.2%* of the sample response that this is a positive effect.

− Phrase 1: "Many tasks performed by auditors can be completed more efficiently by using artificial intelligence

techniques", ***"Chi square = 150.9, Sig. <0.01";*** and ***88.3%*** of the sample response that this is a positive effect.

–   Phrase 6: "Applying artificial intelligence techniques helps in audit planning, risk assessments, tests of transactions, analytics, and the preparation of audit work papers", ***"Chi square = 146.4, Sig. <0.01";*** and ***87.4%*** of the sample response that this is a positive effect.

–   Phrase 8: "Applying artificial intelligence techniques can augment audit quality by providing more evidence and reducing bias", ***"Chi square = 136.6, Sig. <0.01";*** and ***85.6%*** of the sample response that this is a positive effect.

–   Phrase 3: "Auditors' capacity to exercise judgment and professional skepticism will be more vital than ever as they use artificial intelligence techniques", ***"Chi square = 109.8, Sig. <0.01";*** and ***80.2%*** of the sample response that this is a positive effect.

–   Phrase 7: "Applying artificial intelligence techniques improves the collection of audit evidence", ***"Chi square = 101.4, Sig. <0.01";*** and ***78.4%*** of the sample response that this is a positive effect.

–   Phrase 13: "The provision of new services to the customers (e.g., financial and computing advice)", ***"Chi square = 101.4, Sig. <0.01";*** and ***78.4%*** of the sample response that this is a positive effect.

–   Phrase 11: "Artificial intelligence is used in analytics to identify financial misstatements or fraud detection", ***"Chi square = 97.5, Sig. <0.01";*** and ***77.5%*** of the sample response that this is a positive effect.

–   Phrase 2: "The traditional audit stages will either disappear or merge with other stages because of applying artificial intelligence techniques", ***"Chi square = 85.8, Sig. <0.01";*** and ***74.8%*** of the sample response that this is a positive effect.

•   It has also been shown that there are negative effects of artificial intelligence techniques on the audit profession through (The largest frequency is a negative effect):

- Phrase 10: "Potential exposure to cybersecurity risks", ***"Chi square = 97.5, Sig. <0.01";*** and **54.1%** of the sample response that this is a negative effect.
- Phrase 9: "Lack of skills and deprofessionalization", ***"Chi square = 18.2, Sig. <0.01";*** and **52.3%** of the sample response that this is a negative effect.

From the above, it was concluded that artificial intelligence techniques have positive effects on the auditing profession, but they face obstacles in their application, represented by a lack of skills and deprofessionalization, in addition to the possibility of exposure to cybersecurity risks.

The following figure declares the relative frequencies of sample responses about the effect of applying artificial intelligence techniques on the audit profession:
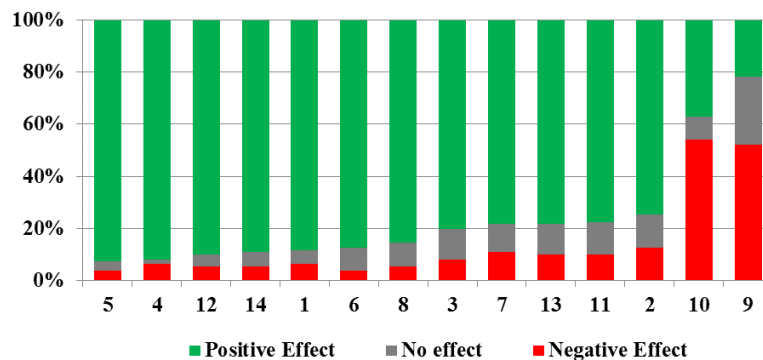
Figure (3)
The relative frequencies of sample responses about the effect of applying artificial intelligence techniques on the audit profession

The phrases were numbered on the horizontal axis in the same order as they appear on the survey list and in the above frequency distribution table.

5.7.3.1.1 Testing the effect of applying artificial intelligence techniques on the audit profession in general:

One sample T-test was applied to test if the mean of responses differed from zero, and the following results were obtained:

Table (6)
The results of one sample T-test

Mean	Std. Deviation	Std. Error Mean	t	Sig.
.6281	.29358	.02787	22.539	0.000

From table (6), it is concluded that there are positive effects of applying artificial intelligence techniques on the audit profession in general since T is positive and significant < 0.01 (**T = 22.539, Sig < 0.01**).

From the previous results, it is concluded that hypothesis 1, "There are no statistically significant positive effects on the audit profession when applying artificial intelligence techniques.", which was formulated in the form of the null hypothesis was rejected, while the alternative hypothesis is accepted.

5.7.3.2 Testing Hypothesis 2: "There are no statistically significant positive effects on the audit committee when applying artificial intelligence techniques.". To test this hypothesis, the frequency table, Chi square test, and one sample t-test were applied to the dimensions of the questionnaire, and the following results were obtained:

Table (7)
Frequency table and Chi square test for the effect of applying artificial intelligence techniques on the audit committee

Phrases		Negative Effect	No Effect	Positive Effect	Chi Square	Sig.
1- Applying AI techniques leads to a universal refresh of what the audit committee (AC) needs and how they are sourcing the committee members.	#	13	22	76	62.8	0.000
	%	11.7	19.8	68.5		
2- Applying AI techniques leads to filling AC seats with directors who have "financial expertise, acting, auditing, and industry expertise.	#	11	26	74	58.5	0.000
	%	9.9	23.4	66.7		
3- Applying AI techniques leads to a review of audit committee composition and membership to confirm that it encompasses the knowledge and experience needed to be effective.	#	10	26	75	62.0	0.000
	%	9.0	23.4	67.6		
4- The responsibilities of the AC are increasing exponentially and require automated help from technology.	#	15	14	82	82.1	0.000
	%	13.5	12.6	73.9		
5- Artificial intelligence adds considerable advancement to analysis because of the exponential amount of scope and depth of data available, which is an important part of risk management and decision-making for the audit committee.	#	4	8	99	156.1	0.000
	%	3.6	7.2	89.2		

Phrases		Negative Effect	No Effect	Positive Effect	Chi Square	Sig.
6-Artificial intelligence eliminates the audit committee's collective bias in the decision-making process.	#	6	32	73	61.7	0.000
	%	5.4	28.8	65.8		
7-Audit committees must watch for changes in how information is treated and assess the implications for controls, processes, data, and reporting.	#	10	8	93	127.2	0.000
	%	9.0	7.2	83.8		
8- Audit committees will have to recruit new members with specialized AI knowledge.	#	14	8	89	110.1	0.000
	%	12.6	7.2	80.2		
9-AI can help audit committee members to better oversee and govern the AI initiatives and activities within the company.	#	7	10	94	131.8	0.000
	%	6.3	9.0	84.7		
10- AI can enable audit committee members to broaden the scope and value of their audit function beyond traditional financial reporting and internal control to cover other areas of corporate reporting, such as cybersecurity or other non-GAAP information.	#	12	10	89	109.7	0.000
	%	10.8	9.0	80.2		
11- The functions of the audit committee will be delegated to artificial intelligence infused bots.	#	53	20	38	14.8	0.001
	%	47.7	18.0	34.2		
12- Artificial intelligence techniques can replace audit committee members.	#	64	21	26	29.9	0.000
	%	57.7	18.9	23.4		

- It is clear from table (7) that applying artificial intelligence techniques has positive effects on the audit committee through

the following, arranged according to their importance and degree of effect (The largest frequency is a positive effect):

- Phrase 5: "Artificial intelligence adds considerable advancement to analysis because of the exponential amount of scope and depth of data available, which is an important part of risk management and decision-making for the audit committee", *"Chi square = 156.1, Sig. <0.01";* and *89.2%* of the sample response that this is a positive effect.

- Phrase 9: "AI can help audit committee members to better oversee and govern the AI initiatives and activities within the company", *"Chi square = 131.8, Sig. <0.01";* and *84.7%* of the sample response that this is a positive effect.

- Phrase 7: "Audit committees must watch for changes in how information is treated and assess the implications for controls, processes, data, and reporting", *"Chi square = 127.2, Sig. <0.01";* and *83.8%* of the sample response that this is a positive effect.

- Phrase 10: "AI can enable audit committee members to broaden the scope and value of their audit function beyond traditional financial reporting and internal control to cover other areas of corporate reporting, such as cybersecurity or other non-GAAP information", *"Chi square = 109.7, Sig. <0.01";* and *80.2%* of the sample response that this is a positive effect.

- Phrase 8: "Audit committees will have to recruit new members with specialized AI knowledge", *"Chi square = 110.1, Sig. <0.01";* and *80.2%* of the sample response that this is a positive effect.

- Phrase 4: "The responsibilities of the AC are increasing exponentially and require automated help from technology", *"Chi square = 82.1, Sig. <0.01";* and *73.9%* of the sample response that this is a positive effect.

- Phrase 1: "Applying AI techniques leads to a universal refresh of what the audit committee (AC) needs and how they are sourcing the committee members", *"Chi square = 62.8, Sig.*

<0.01”; and *68.5%* of the sample response that this is a positive effect.

- Phrase 3: "Applying AI techniques leads to a review of audit committee composition and membership to confirm that it encompasses the knowledge and experience needed to be effective", *"Chi square = 62.0, Sig. <0.01";* and *67.6%* of the sample response that this is a positive effect.

- Phrase 2: "Applying AI techniques leads to filling AC seats with directors who have "financial expertise, acting, auditing, and industry expertise", *"Chi square = 58.5, Sig. <0.01";* and *66.7%* of the sample response that this is a positive effect.

- Phrase 6: "Artificial intelligence eliminates the audit committee's collective bias in the decision-making process", *"Chi square = 61.7, Sig. <0.01";* and *65.8%* of the sample response that this is a positive effect.

- It has also been shown that there are negative effects of artificial intelligence techniques on the audit committee through (The largest frequency is a negative effect):

- Phrase 12: "Artificial intelligence techniques can replace audit committee members", *"Chi square = 29.9, Sig. <0.01";* and *57.7%* of the sample response that this is a negative effect.

- Phrase 11: "The functions of the audit committee will be delegated to artificial intelligence infused bots", *"Chi square = 14.8, Sig. <0.01";* and *47.7%* of the sample response that this is a negative effect.

From the above, it was concluded that artificial intelligence techniques have positive effects on the audit committee, but they have negative effects in their application, represented by the belief that artificial intelligence techniques can replace members of the audit committee and that the functions of the audit committee will be delegated to artificial intelligence infused bots.

The following figure declares the relative frequencies of sample responses about the effect of applying artificial intelligence techniques on the audit committee:
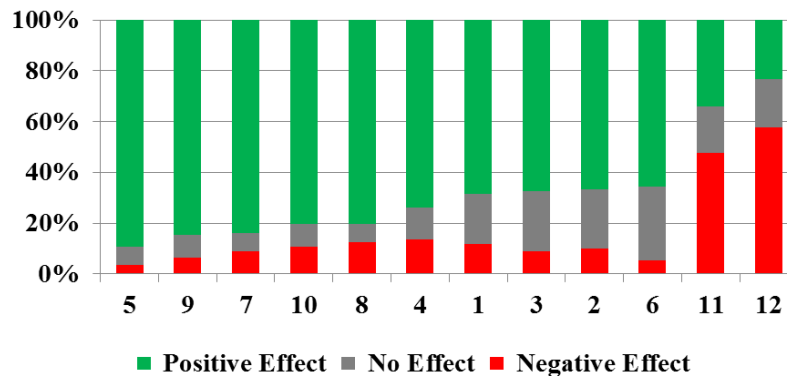
Figure (4)

The relative frequencies of sample responses about the effect of applying artificial intelligence techniques on the audit committee

5.7.3.2.1 Testing the effect of applying artificial intelligence techniques on the audit committee in general:

One sample T-test was applied to test if the mean of responses differed from zero, and the following results were obtained:

Table (8)

The results of one sample T-test

Mean	Std. Deviation	Std. Error Mean	t	Sig.
0.5173	0.3566	.03385	15.283	0.000

From table (8), it is concluded that there are positive effects of applying artificial intelligence techniques on the audit committee in general since T is positive and significant < 0.01 (**T = 15.283, Sig < 0.01**).

From the previous results, it is concluded that hypothesis 2, "There are no statistically significant positive effects on the audit committee when applying artificial intelligence techniques.", which was formulated in the form of the null hypothesis was rejected, while the alternative hypothesis is accepted.

Section 6: Conclusions, Findings, and Recommendations:
6.1 Conclusions:
The study concluded that:
1-H1: "There are no statistically significant positive effects on the audit profession when applying artificial intelligence techniques." was rejected and accepted the alternative hypothesis since: There are statistically significant positive effects on the audit profession when applying artificial intelligence techniques in general since T is positive and significant < 0.01 *(T = 22.539, Sig < 0.01).*
2- H2: "There are no statistically significant positive effects on the audit committee when applying artificial intelligence techniques." was rejected and accepted the alternative hypothesis since: There are statistically significant positive effects on the audit committee when applying artificial intelligence techniques in general since T is positive and significant < 0.01 *(T = 15.283, Sig < 0.01).*

6.2 Findings:
1- Applying artificial intelligence techniques has positive effects on the audit profession, such as:

   A- Providing time savings, higher efficiency and accuracy, minimize risks and biases, and larger data coverage.

   B- Providing auditors with the means necessary for increasing the effectiveness and efficiency of their jobs.

C- Adding considerable advancement to analysis because of the exponential amount of scope and depth of data available.

D- Helping in audit planning, risk assessments, tests of transactions, analytics, and the preparation of audit work papers.

E- Improving the collection of audit evidence.

2- Applying artificial intelligence techniques has negative effects on the audit profession, such as:

A- Potential exposure to cybersecurity risks.

B- Lack of skills and deprofessionalization.

3- Applying artificial intelligence techniques has positive effects on the audit committee, such as:

A- Adding considerable advancement to analysis because of the exponential amount of scope and depth of data available, which is an important part of risk management and decision-making for the audit committee.

B- Helping audit committee members to better oversee and govern the AI initiatives and activities within the company.

C- Enabling audit committee members to broaden the scope and value of their audit function beyond traditional financial reporting and internal control to cover other areas of corporate reporting, such as cybersecurity or other non-GAAP information.

D- Leading to a universal refreshment of what the audit committee (AC) needs and how they are sourcing the committee members.

E- Leading to a review of audit committee composition and membership to confirm that it encompasses the knowledge and experience needed to be effective.

    F- Eliminating the audit committee's collective bias in the decision-making process.

4- Applying artificial intelligence techniques has negative effects on the audit committee, such as:

    A- Replacing audit committee members.

    B- Delegating the functions of the audit committee to artificial intelligence infused bots.

6.3 Recommendations:

1- The importance of designing and implementing programs to develop auditors' awareness of applying artificial intelligence techniques.

2- The need for the knowledge and skill required to use these techniques on the one hand and benefit from their outputs in the review process on the other hand.

3- Adequate insurance and protection for information are necessary.

4- Developing university curricula to include specializations related to artificial intelligence.

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