The impact of artificial intelligence applications on the performance of accountants and audit firms in Saudi Arabia

Khaled Salmen Aljaaidi[a*], Neef Faraj Alwadani[a] and Anass Hamadelneel Adow[a]

[a]Accounting Department, College of Business Administration, Prince Sattam bin Abdulaziz University, Saudi Arabia

CHRONICLE	ABSTRACT
	The purpose of this study is to investigate the impact of using artificial intelligence applications on the performance of accountants and audit firms. The final sample for this study comprises 38 audit firms. This study uses a survey-based methodology in the context of Saudi Arabia. The results of the multiple regression revealed that the audit firms using artificial intelligence applications perceive them as useful instruments that increase the performance of accountants and audit firms. They can reduce the cost, effort, and time of the audit process, achieve a competitive advantage for the audit firms, help auditors better determine materiality, achieve a competitive advantage, improve the performance of the audit team, carry out the continuous audit process better than the traditional audit, enable auditors to select audit samples with high efficiency, improve the quality of control procedures on electronic transactions and files used by the client, contribute to the management of operations and tasks with more sophisticated and intelligent mechanisms, increase the efficiency and effectiveness of the audit process and the efficiency and effectiveness of planning and supervising the audit process, reduce uncertainty and audit risk. The results reported by this study can be valuable for the accounting and auditing professions, audit firms, and standards and auditing regulators to deeply understand the extent to which artificial intelligence applications influence the performance of accountants and audit firms.

1. Introduction

Accounting and auditing are confronting a major challenge because of the rapid development of communication and information technologies. This challenge is represented by the requirement to provide tools that enable it to deal with the modern technical environment, as well as the emergence of something that is referred to as digital auditing. This is particularly significant given that these technologies support the work of accountants and auditors in a variety of ways, including the establishment of knowledge bases, improving outputs, rationalizing and guiding methods of dealing with everyday procedures, improving the quality of services, supporting the audit strategy, decreasing audit risks, and raising the profitability of accounting and auditing firms (Amerahom, 2022). This will result in the disclosure of pertinent accounting information, which will, in turn, improve transparency and the decision-making process for stakeholders. When it comes to reporting, big data can assist in the formulation and refinement of accounting standards. This can help ensure that the accounting profession will continue to deliver helpful information even as the dynamic, real-time, global economy continues to develop. Artificial intelligence (AI) and machine learning are currently automating a variety of tasks. It refers to the massive volumes of data that are produced as a result of innovations in the field of artificial intelligence, which are continuing to have a disruptive influence on all fields. Even the accounting industry isn't leaving any opportunities on the table. However, the accounting profession

has lagged other industries in terms of digitization for a considerable amount of time due to the high regulatory requirements that must be met to ensure the integrity of the accounts (Afroze & Aulad, 2020).

Because of recent advances in technology, the auditing profession has undergone significant transformations. As a result of these transformations, new services, such as financial studies and consulting, have been made available to clients. In addition to this, the profession of auditing has witnessed the growth of new types and services. The auditing profession is currently more competitive than it has ever been. Because of this, auditors have widely utilized the new methodologies and tools supplied by information technology and artificial intelligence to speed up the process of decision-making and improve the quality of audits (Luo et al., 2018; Li & Zheng, 2018; Elliot et al., 2020; Amerahom, 2022).

In other words, the fields of accounting and auditing are impacted by artificial intelligence in several ways, including the saving of time, effort, and money; the provision of information; the improvement of the information's quality; and the prevention of accounting fraud. It makes accountants and auditors more productive and efficient, and AI technology can process accounting books faster than ever before by using natural language processing and computer vision. This means that daily reports can be done automatically and for less money. Using document processing technology that is driven by artificial intelligence can speed up internal accounting tasks like invoices, purchase orders, expense reports, accounts payable, and depreciation and amortization schedules. Artificial intelligence is being used by accounting and auditing firms to improve their focus on several factors that affect the quality of audits. These factors include data analysis, time management, accuracy, and a comprehensive perspective of the corporate environment. As a result, the firm's benefactors are receiving better service. Intelligent robots conduct functions as intelligently as people, significantly reducing the amount of time required to process accounting transactions in comparison to manual processes (Eltweri, 2021; Madina, 2022; Li & Zheng, 2018; Amerahom, 2022; Akinadewo, 2021).

Accounting professionals are now able to devote more of their time to higher-value tasks such as analysis and problem-solving, decision-making, the development of strategy, and leadership because of advances in AI technology. According to Christauskas and Miseviciene (2021) and Cho et al. (2018), artificial intelligence (AI) can increase productivity, accuracy, and efficiency while also reducing costs and operational time. According to Qiu (2021), artificial intelligence speeds up the flow of all information while also encouraging a shift in the manner of company management.

This study examines the impact of artificial intelligence applications on the performance of accountants and audit firms. Several empirical studies found that the usage of artificial intelligence applications impacts positively the performance of accountants and audit firms, in general, and the audit profession, in particular (Alsoulmi, 2020; Rashwan and Alhelou, 2020; Rizk, 2020; Bygren, 2016; Assaf, 2022; Al-Rifai, 2022; Qhabeel et al., 2022; Abbad and Mubarak, 2022; Afroze & Aulad, 2020; Eltweri, 2021; Madina, 2022; Li & Zheng, 2018; Amerahom, 2022; Akinadewo, 2021; Vărzaru, 2022; Christauskas & Miseviciene, 2021; Cho et al., 2018; Qiu, 2021). A review of the extant research reveals that there is a paucity of research linking the usage of artificial intelligence applications with the performance of accountants and audit firms in the context of Saudi Arabia.

This study is valuable because it provides academics with better knowledge of how external auditors perceive the impact that using AI apps has on accountants' and audit firms' performance. Therefore, this research aims to report both the extent to which auditors are using AI applications and their level of familiarity with AI's significance. It addresses persistent and critical concerns about boosting the effectiveness of the external audit function by increasing the efficiency with which audit firms perform their professional duties and the potential for relying on such firms to arrive at a specific concept of artificial intelligence. This study is especially significant since it keeps up with recent advances in accounting research. These advancements are focused on the role that artificial intelligence approaches play in increasing the professional performance of audit firms and the quality of services that these firms provide. This study presents new empirical evidence in an environment where research on the impact of artificial intelligence on the performance of accountants and audit firms in Saudi Arabia is lacking. The study is being carried out in a setting where research is scarce on the subject. Furthermore, audit firms benefit from this study because it exhibits the importance of artificial intelligence techniques in improving professional performance.

The remaining sections of the paper are as follows: The following section reviews the literature and develops the hypothesis. The third section highlights the research methodology. The analysis and interpretations are discussed in the fourth section, while conclusions are drawn in the final section.

2. literature review and hypothesis development

Artificial intelligence enhances auditing quality and saves professionals time and effort. When accounting professionals have access to an increasing number of resources and tools, they can reduce the amount of time they spend on tedious processes, freeing up more time for them to focus on other business strategies. To keep up with the revolutionary changes taking place in all industries other than the accounting profession, it is essential to investigate the possibilities of artificial intelligence (AI) in auditing in order to make auditing approaches more user-friendly and straightforward (Afroze & Aulad, 2020). According to the findings of Odoh and colleagues (2018), the implementation of artificial intelligence has a beneficial impact on the efficiency of accounting functions. Shi (2020) reported that artificial intelligence technologies boost company efficiency, minimize work errors, avoid and control corporate risks, improve firm competitiveness, improve human resources efficiency, and improve enterprise competitiveness. The use of technologies based on artificial intelligence can also improve and advance

accounting efforts toward the development of artificial intelligence systems. Emetaram and Uchime (2021) provided evidence that there was a favorable impact on the accounting profession, which ought to be incorporated into efforts to maximize professional production. Vărzaru (2022) indicated that incorporating AI-based solutions into managerial accounting increases flexibility through process innovation and simplification, boosts accounting data value, and is easy to implement due to its high level of automation and personalization.

According to Rashwan and Alhelou (2020), the implementation of artificial intelligence in the accounting profession helps to ensure the continuity of business operations. This is accomplished through the utilization of supercomputers and smartphones to complete accounting tasks like bank transfers, financial payments, and the settlement of accounts, as well as to provide accounting services to clients like sales, purchases, receiving orders, dispatches, and reservations, processing and storing enormous amounts of data while at the same time reducing the amount of time required for the processing cycle, accounting duties can be performed more correctly by machines equipped with artificial intelligence, thereby lowering the rate of errors, carrying out accounting tasks that are difficult and complex, answering customers' questions, handling customers' complaints, and looking over customers' documents.

Alsoulmi (2020) researched to determine the elements that influence the digitization of accounting employment in Saudi Arabia's small and medium-sized firms (SMEs). In addition to this, he investigated the challenges and obstacles that are brought about by the digitalization of accounting roles in these firms, as well as how this can impact the organizations' financial performance. The process of digitalization that has been taking place over the course of the last five years was the primary focus of the research. The final sample of this study consisted of 21 Saudi male and female graduates who acquired their education from institutions located outside of Saudi Arabia. The findings of this research indicate that there is a significant correlation between the degree to which accounting occupations have been digitized and factors such as the size of the firm, the sector in which it operates, and other characteristics of the firms themselves. The findings of this study also demonstrated that there is a significant correlation between the degree to which accounting tasks are completed using computers and the enhancement of a firm's financial performance. It also demonstrated that there are differences in the level of digitization of accounting jobs in SMEs depending on the size of the firm that are statistically significant.

In light of the Corona outbreak that swept the United States in the year 2020, Rashwan and Alhelou (2020) investigated the effects that would be precipitated by the implementation of artificial intelligence within accounting and auditing organizations and how those effects would play out. To compile the necessary data for this investigation, a questionnaire was given to a total of 170 accounting professionals and auditors. There were a total of 155 valid questionnaires that were available for examination. This study found that artificial intelligence improves and develops accountants' and auditors' professional performance, their ability to complete complex accounting and auditing tasks, the efficiency of their cadres and systems, and their ability to complete these tasks during the Corona pandemic. The findings of the study indicate that the implementation of artificial intelligence within the fields of accounting and auditing is an absolute necessity in preparation for the next significant cycle in which these disciplines will participate. It is essential to improve the effectiveness of the accounting and auditing procedures by ensuring that the necessary results are delivered in a timely fashion.

Rizk (2020) conducted a study to determine the level of commitment shown by Egyptian accounting and auditing firms toward the advancement of job-related performance through the deployment of technologies that make use of artificial intelligence. This study has the potential to provide evidence that can contribute to the development of the capacity of accounting and auditing firms to comply with international accounting standards during auditing, particularly with regard to quality control needs. This final sample of this study included 82 accounting and auditing firms. According to the findings of the study, accounting and auditing firms in Egypt, in general, are not dedicated to providing requirements for the use of artificial intelligence techniques to increase capabilities in applying international standards for accounting and auditing. This was determined by looking at the firms' responses to the survey questions, in particular quality control standards, and the fact that these firms are uninformed of the procedures that need to be followed in order for accounting and auditing firms to be able to execute the quality control standards in their operations. This study also showed that Egyptian accounting and auditing firms are not dedicated to setting standards for the use of artificial intelligence approaches to improve capabilities. According to the findings of the study, Egyptian accounting and auditing firms are not committed to providing standards for the utilization of artificial intelligence techniques in order to improve skills.

Bygren (2016) conducted research into the many approaches that digital accounting firms could use to organize a general business model to transition into a digitalized firm. This has been achieved through the utilization of a large number of case studies, to present generalized results on the characteristics of business models in addition to barriers and facilitators for digitalization that have an effect on business models. To collect data, interviews were conducted with a number of different accounting firms, each of which promotes itself as a digital actor. The findings of this study indicate that the process of digitization has an immediate influence on how companies should organize their strategic activities. The implementation of digital accounting will result in a number of consequences, a substantial number of which will have an immediate impact on a variety of strategies, actions, and procedures. The process of digitalizing organizations will require the establishment of cultures that are adaptable to digitalization in order to be successful. The conclusions include the following, which is one of them: as a direct result of the accounting industry's shift toward digitalization, the market will soon have access to digital accounting tools, platforms for the exchange of knowledge, and communication channels. In addition, there is a great deal of

obstacles to overcome in order to transform an accounting firm into a fully digital one; however, there are also some opportunities.

Assaf (2022) conducted a study into the function of the management accountant within the context of modern technological systems that are backed by artificial intelligence. He was able to accomplish this by providing management accountants at Egyptian firms operating in the electronics and automotive industries with an explanation of the consequences that applying the techniques of the fourth industrial revolution and artificial intelligence will have on their jobs. In addition to this, he investigated the implications of this finding for the activities, roles, and responsibilities of management accountants. According to the conclusions of this study, there is a considerable correlation between the requirements and applications of artificial intelligence systems and the technologies that are driving the fourth industrial revolution. This correlation was shown to exist because artificial intelligence systems are becoming increasingly important. In addition, there is a connection between the role of the management accountant and the implementation of technologies and systems of the fourth generation, such as artificial intelligence and related systems. Furthermore, there is a statistically significant link between the issues that management accountants encounter as a consequence of artificial intelligence systems and the techniques of the fourth industrial revolution and the job that management accountants do in light of these technologies. The challenges that management accountants face as a result of artificial intelligence systems and the techniques of the fourth industrial revolution are outlined in the following sentence: Systems that use artificial intelligence and the technologies of the so-called "fourth industrial revolution" are to blame for the emergence of these difficulties.

Al-Rifai (2022) investigated how the use of artificial intelligence could contribute to the improvement of the effectiveness and efficiency of electronic accounting disclosure. The participants in this study included accountants and auditors from companies that were traded on the Egyptian Stock Exchange as well as financial analysts from financial brokerage firms. The findings demonstrated that the application of techniques involving artificial intelligence has the potential to improve the efficacy and efficiency of electronic accounting disclosure. This study demonstrated, in particular, that artificial intelligence approaches are significant due to the myriad positive effects they may have and the significance of putting those effects to use in commercial settings. In addition, there is a statistically significant correlation between the employment of techniques based on artificial intelligence and the elements that affect the quality and efficiency with which financial reports are shared via electronic accounting.

Using data mining technologies, Qhabeel, Hafez, and Sadah (2022) proposed a model for analyzing performance to anticipate financial misconduct among listed firms on the Egyptian stock market. This model is intended to be used among Egyptian firms. The data were analyzed using a total of five different classification algorithms: random forest, logistic regression, key-value network (KNN), naive bayes, and support vector machine (SVM). These algorithms were compared against one another in order to determine which one was the most effective, and the results showed that the naive Bayes algorithm was the one with the highest level of accuracy. This research was brought to a close with the presentation of a proposed model for predicting corruption. This model consists of some indicators that performance auditors can use to assist in the prediction of financial corruption. These indicators are as follows: liquidity ratio, quick liquidity ratio, financial leverage, total liabilities / total assets, rate of return on investment, rate of return on sales, net profit before interest and taxes/sales, net profit before interest and taxes / total assets, asset turnover rate. The study also tested the reliability of these indicators.

Abbad and Mubarak (2022) investigated how the use of expert systems affects the level of professional competence demonstrated by auditors in Yemen. This research makes use of a methodology that is based on a survey. The Certified Public Accountants (CPA) whose licenses have been recently renewed by the Ministry of Trade and Industry in Yemen and who are registered with the Association of Certified Public Accountants for the year 2021 make up the sample for the survey. The Ministry of Trade and Industry in Yemen is the organization that is responsible for renewing the CPAs' licenses. According to the findings of this study, utilizing an expert system has a statistically significant impact on the level of professional performance gained by auditors in Yemen. This conclusion was reached after examining the data collected during the course of the investigation. In addition, a great number of audit companies, particularly those that are affiliated with other businesses, make use of expert systems.

In the context of the modernization and digitization of management accounting, Vărzaru (2022) carried out an investigation into the extent to which accountants in Romanian companies have embraced the application of technology that makes use of artificial intelligence in order to determine how far this adoption extends. The final sample for this study was 396 employees who are experts in managerial accounting. The findings indicated that there is a chance that the proposal will be accepted. The results of this study showed that the artificial intelligence techniques used in management accounting provide flexibility to managers by providing alternative solutions that lead to innovation and reduce operations. They also show the benefit of using accounting information, which is fairly easy to use.

Amerahom (2022) conducted a study to investigate how accountants and auditors perceive their careers in the context of the advancement of artificial intelligence technologies. The findings of the survey indicated that professionals in the accounting and auditing industries are aware of the significance of the impact that approaches using artificial intelligence have had on the methodologies used in these fields. Therefore, accountants and auditors cannot compete without understanding these approaches. This necessitates the integration of these techniques into the accounting and auditing professions as well as boosting the level of awareness among professionals about how to improve the utilization of these technologies.

The above discussions make us predict the following testable hypothesis:

H₁: *The use of artificial intelligence applications impacts the performance of accountants and audit firms.*

3. Research methodology

3.1 Questionnaire design

The methodology of this study is based on a survey. This study utilized a questionnaire to collect data from licensed audit firms. It used a quantitative approach to answer the research question, "To what extent does the usage of artificial intelligence applications impact the performance of accountants and audit firms?" It predicts a relationship between the usage of artificial intelligence and the performance of accounting and audit firms in the context of Saudi Arabia. This study's conceptual framework was adopted and adapted from a number of related empirical studies (Alsoulmi, 2020; Rashwan and Alhelou, 2020; Rizk, 2020; Bygren, 2016; Assaf, 2022; Al-Rifai, 2022; Qhabeel et al., 2022; Abbad and Mubarak, 2022; Afroze & Aulad, 2020; Eltweri, 2021; Madina, 2022; Li & Zheng, 2018; Amerahom, 2022; Akinadewo, 2021; Vărzaru, 2022; Christauskas & Miseviciene, 2021; Cho et al., 2018; Qiu, 2021). The questionnaire is divided into two distinct components. The first section included respondents' demographic information. The second section contained 43 statements highlighting the impact of using artificial intelligence on the performance of accountants and audit firms.

3.2 Instrument of measurement

3.2.1 Demographic information

The demographic information in this study included gender, nationality, age, academic qualification, job position, experience, professional certificates, artificial intelligence training, specialization, audit firm age, number of employees, number of licensed auditors, auditor type, using auditing software, and using artificial intelligence. As for gender, a nominal value of "1" is assigned to males, and "0" is assigned to females. With regard to nationality, a nominal value of "1" is assigned to Saudi nationality, and "0" is assigned to non-Saudi nationality. As for the age, a nominal value of "1" is assigned for the respondents aged less than 30 years; a nominal value of "2" is assigned for ages 30-35 years; a nominal value of "3" is assigned for ages of 36-40 years; a nominal value of "4" is assigned for ages of 41-45 years; a nominal value of "5" is assigned for ages of 46-50 years; and a nominal value is assigned for ages above 50 years.

With regard to academic qualification, a nominal value of "1" is assigned for less than a bachelor's degree; a nominal value of "2" is assigned for a bachelor's degree; a nominal value of "3" is assigned for a master's degree; and a nominal value of "4" is assigned for a Ph.D. Regarding the job position, a nominal value of "1" is assigned for the auditor, a nominal value of "2" is assigned for the auditing manager, a nominal value of "3" is assigned for the auditor assistant, a nominal value of "4" is assigned for a partnership, and a nominal value of "5" is assigned for other job positions. With respect to experience, a nominal value of "1" is assigned for less than 5 years of work experience; a nominal value of "2" is assigned for 5–10 years; a nominal value of "3" is assigned for 11–15 years; a nominal value of "4" is assigned for 16–20 years; and a nominal value of "5" is assigned for 20 and above years.

With respect to the professional certificates, a nominal value of "1" is assigned for SOCPA, a nominal value of "2" is assigned for ACCA, a nominal value of "3" is assigned for other CPA certificates, and a nominal value of "4" is assigned for unavailable professional certificates. With regard to the training in artificial intelligence, a nominal value of "1" is assigned for unavailable training, a nominal value of "2" is assigned for 1 training workshop, a nominal value of "3" is assigned for 2 training workshops, a nominal value of "4" is assigned for 3 training workshops, a nominal value of "5" is assigned for 4 training workshops, a nominal value of "6" is assigned for 5 training workshops, a nominal value of "6" is assigned for 6 training workshops, a nominal value of "6" is assigned for 5 training workshops, and a nominal value of "7" is assigned for more than 6 training workshops.

As for the specialization, a nominal value of "1" is assigned for accounting, a nominal value of "2" is assigned for finance, a nominal value of "3" is assigned for other business management, and a nominal value of "4" is assigned for other specializations. Regarding the age of the audit firm, a nominal value of "1" is assigned for less than 5 years, a nominal value of "2" is assigned for 5–10 years, a nominal value of "3" is assigned for 11–15 years, a nominal value of "4" is assigned for 16–20 years, a nominal value of "5" is assigned for 21–25 years, and a nominal value of "6" is assigned for ages above 25 years. In terms of the number of employees, a nominal value of "1" is assigned for less than 5 employees; a nominal value of "2" is assigned for 5–10 employees; a nominal value of "3" is assigned for 11–20 employees; and a nominal value of "4" is assigned for more than 25 employees.

With respect to the number of licensed auditors, a nominal value of "1" is assigned for 1 licensed auditor, a nominal value of "2" is assigned for 2 licensed auditors, and a nominal value of "3" is assigned for 3 licensed auditors. A nominal value of "4" is assigned to 4 licensed auditors, and a nominal value of "5" is assigned to 5 or more licensed auditors. As for the auditor type, a nominal value of "1" is assigned for Big 4 audit firms, a nominal value of "2" is assigned for international audit firms, and a nominal value of "3" is assigned for local audit firms. With regard to auditing software usage, a nominal value of "1" is

assigned for yes, and a nominal value of "2" is assigned for no. In terms of using artificial intelligence software, a nominal value of "1" is assigned for yes, and a nominal value of "2" is assigned for no.

3.2.2 Artificial intelligence and performance of accountants and audit firms (AIAAP)

The dependent variable is the perception of the impact of artificial intelligence on the performance of accountants and audit firms. This variable is measured on a five-point Likert scale. The Likert scale has five points ranging from 5 (strongly agree) to 1 (strongly disagree), with 5 (strongly agree) representing the highest level of agreement regarding the impact of artificial intelligence on the performance of accountants and audit firms and 1 (strongly disagree) representing the lowest level of agreement. This variable is measured using 43 distinct items to ascertain the degree of artificial intelligence's impact on the performance of accountants and audit firms. Before being used for further analysis, this variable underwent a reliability test to determine its dependability. The 43 items are presented in Appendix 1.

3.3 Model specification and analysis

This study investigates the impact of artificial intelligence usage (AIU) on the performance of accountants and audit firms (AIAAP). This study also controls several control variables that were confirmed by previous research to have an influence on the performance of accountants and audit firms. These include audit software (AUSFT), audit quality (AUQ), professional certificates (PRCE), licensed auditors (LIAU), and gender (GEND). The model of this study can be expressed as follows:
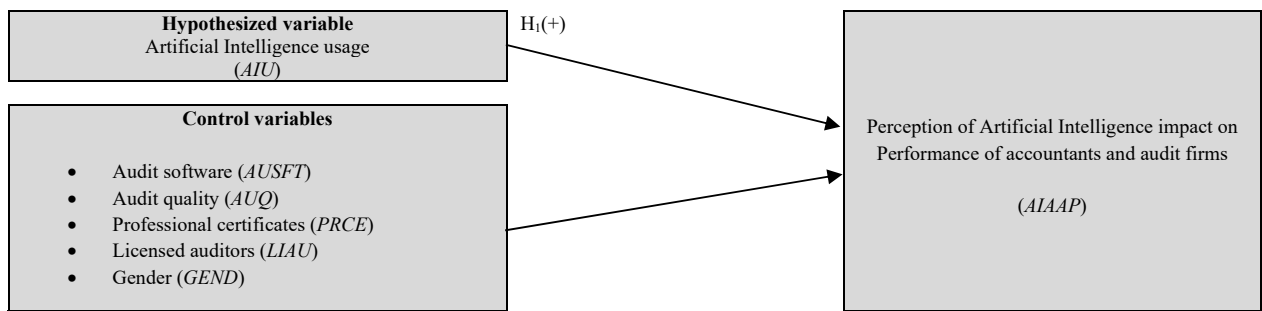
Hypothesized variable Artificial Intelligence usage (*AIU*)	$H_1(+)$	
Control variables • Audit software (*AUSFT*) • Audit quality (*AUQ*) • Professional certificates (*PRCE*) • Licensed auditors (*LIAU*) • Gender (*GEND*)		Perception of Artificial Intelligence impact on Performance of accountants and audit firms (*AIAAP*)

Fig. 1. Theoretical Framework

Several statistical methods were used to analyze the study's data, which were analyzed using SPSS version 20 for Windows. Frequencies and percentages, multiple regression, Cronbach Alpha, correlation analysis, one sample *t*-test, and factor analysis were utilized as statistical instruments.

3.4 Data collection

External auditors in Saudi Arabia who held licenses issued by the Saudi Organization for Chartered and Professional Accountants (SOCPA) were the participants in this study. Using Google Forms, a link was generated for respondents to access the questionnaires that were sent out to them. The design interface of Google Forms is user-friendly, intuitive, and simple to operate. The distribution of the survey link was done personally by the researchers to whom they have a connection from the licensed external auditors using popular social media networks such as WhatsApp groups, Instagram, Snap Chat, Facebook, and email, and via SOCPA by sending an official email to SOCPA asking them to assist us in collecting data from the auditors. In other words, the researchers asked SOCPA for help collecting data from the auditors. The survey was distributed between January and March of 2023, and data collection was carried out throughout that same time period. There were a total of 38 auditors who filled out the questionnaire.

4. Analysis and interpretations

4.1 Sample characteristics

As shown in Table 1, the sample was comprised of 86.8% males and 13.7% females. Most of the respondents, 22 (57.9%), were Saudi nationals, aged between 30 and 35 (28.9%), holding a bachelor's degree (63.2%), and majoring in accounting (65.8%). In addition, the majority of the respondents had a job position as auditors (42.1%), a work experience of less than 5 years (28.9%), and a SOCPA professional certificate (28.9%). Further, most of the respondents had no training in artificial intelligence (68.4%), worked in audit firms that were aged less than 5 years (42.1%), had a number of employees of 3-5 (34.2%), had a licensed auditor (42.1%), and were local audit firms (71.1%). Moreover, half of the respondents (50%) use artificial intelligence software in carrying out their audit work, and the majority of the respondents (86.8%) use auditing software.

Table 1

Sample characteristics

Demographic information	Frequency	Percent %	Demographic information	Frequency	Percent %
Gender			**Nationality**		
Male	33	86.8	Saudi	22	57.9
Female	5	13.2	Non-Saudi	16	42.1
Age			**Job position**		
Less than 30	8	21.1	Auditor	16	42.1
30-35	11	28.9	Auditing manager	6	15.8
36-40	6	15.8	Auditor assistant	3	7.9
41-45	5	13.2	Partnership	8	21.1
46-50	3	7.9	Others	5	13.2
Above 50	5	13.2			
Academic qualification			**Experience**		
Below bachelor degree	2	5.3	Less than 5 years	11	28.9
Bachelor degree	24	63.2	5-10	9	23.7
Master degree	7	18.4	11-15	7	18.4
PhD	5	13.2	16-20	3	7.9
			Above 20	8	21.1
Professional certificates			**Auditor type**		
SOCPA	11	28.9	Big 4 audit firm	4	10.5
ACCA	1	2.6	International audit firm	7	18.4
Other CPA certificates	7	18.4	Local audit firm	27	71.1
None	19	50			
Artificial Intelligence training			**Audit firm age**		
No training	26	68.4	Less than 5 years	16	42.1
1 training workshop	3	7.9	5-10	5	13.2
2 training workshops	6	15.8	11-15	2	5.3
3 training workshops	1	2.6	16-20	3	7.9
4 training workshops	0	0	21-25	12	31.6
5 training workshops	1	2.6			
6 training workshops	1	2.6			
Number of employees			**Number of licensed auditors**		
Less than 5 employees	3	7.9	1 auditor	16	42.1
5-10	13	34.2	2 auditors	5	13.2
11-20	6	15.8	3 auditors	2	5.3
21-25	4	10.5	4 auditors	3	7.9
More than 25 employees	12	31.6	5 and above auditors	12	31.6
Using auditing software			**Using Artificial Intelligence software**		
Yes	33	86.8	Yes	19	50
No	5	13.2	No	19	50
Specialization					
Accounting	25	65.8			
Finance	12	31.6			
Business management	1	2.6			

4.2 Summary statistics

The descriptive statistics for each factor that makes up the auditors' perception of the impact that artificial intelligence will have on the performance of accountants and audit companies are presented in Table 2. The mean, standard deviation, standard error mean, skewness, and kurtosis are the components that make up these statistics.

Table 2 reveals that the item means varied between 3.55 and 4.47 and that the standard deviations varied between 0.655 and 0.891 for each individual item. This was determined in the same manner that the skewness and kurtosis values for the normal distribution of the data were determined. Both methods were applied to the data. The values of skewness and kurtosis indicate that the data were normally distributed because they were within the range of -1.96 and 1.96, as shown in Table 2. The following is an illustration of the Likert scale coding that can be found in Table 3.

The closer the degree to (5), the greater the agreement of the item, while the closer the degree to (1), the degree of agreement decreases. Table 4 shows the highest and lowest ranks of the items. The respondents gave item (5), stating: "AI systems save cost, time, and effort," the first rank (4.47), and item (20), stating: "The use of AI techniques helps auditors better determine materiality," the second rank (4.29). Table 4 illustrates that accountants and auditors strongly agree with the item (14), stating that "the use of artificial intelligence techniques achieves a competitive advantage for the audit firm" ranks as the third item (4.29). The fourth item (15) given a rank (4.24) was "The use of artificial intelligence techniques improves the performance of the audit team." The respondents gave item (22) stating that "The use of artificial intelligence techniques helps auditors to carry out the continuous audit process better than the traditional audit" as the fifth rank (4.21), and the sixth rank (4.21) was given to the item (18) stating that "The use of artificial intelligence techniques enables auditors to select audit samples with high efficiency." Item (43) was given a seventh rank (4.21), which stated that "the use of artificial intelligence techniques improves the quality of control procedures on electronic transactions and files used by the client." The final too-high rank was given to item (6) (4.21), stating that "AI systems contribute to the management of operations and tasks with more sophisticated and intelligent mechanisms."

Table 2
Descriptive statistics

Items	Mean	Std.Dev	Std Error Mean	Skewness	Kurtosis
Item 1	4.08	.749	.111	-.539	.246
Item 2	4.00	.735	.109	-.431	.222
Item 3	4.08	.784	.117	-.497	-.169
Item 4	4.16	.754	.111	-.673	.395
Item 5	4.47	.797	.114	-1.434	1.369
Item 6	4.21	.811	.120	-.734	-.094
Item 7	3.55	.891	.142	-.167	-.602
Item 8	4.05	.769	.115	-.468	-.063
Item 9	3.92	.850	.131	-.401	-.388
Item 10	3.76	.852	.133	-.341	-.316
Item 11	4.18	.766	.112	-.713	.324
Item 12	4.00	.735	.109	-.431	.222
Item 13	4.18	.766	.112	-.713	.324
Item 14	4.29	.802	.118	-.917	.269
Item 15	4.24	.786	.115	-1.160	1.725
Item 16	4.18	.801	.119	-.686	-.069
Item 17	4.18	.730	.105	-.743	.819
Item 18	4.21	.811	.120	-.734	-.094
Item 19	3.97	.788	.119	-.652	.511
Item 20	4.29	.732	.104	-.956	1.171
Item 21	3.95	.733	.110	-.351	.110
Item 22	4.21	.704	.100	-.813	1.334
Item 23	3.95	.804	.123	-.232	-.614
Item 24	3.87	.844	.131	-.309	-.448
Item 25	4.05	.733	.108	-.517	.388
Item 26	3.95	.695	.103	-.438	.629
Item 27	3.84	.718	.108	-.218	.018
Item 28	3.87	.875	.136	-.499	-.232
Item 29	3.74	.860	.135	-.256	-.445
Item 30	3.89	.727	.109	-.280	.045
Item 31	3.89	.689	.102	-.384	.539
Item 32	4.05	.695	.101	-.579	.973
Item 33	3.92	.673	.099	-.469	.889
Item 34	3.87	.704	.105	-.300	.252
Item 35	4.13	.704	.101	-.681	1.069
Item 36	3.95	.655	.095	-.556	1.319
Item 37	4.16	.718	.104	-.708	.927
Item 38	4.16	.754	.111	-.673	.395
Item 39	4.03	.753	.112	-.445	.066
Item 40	4.00	.735	.109	-.431	.222
Item 41	4.11	.764	.113	-.567	.132
Item 42	3.79	.741	.113	-.057	-.324
Item 43	4.21	.704	.100	-.813	1.334
Overall	4.09	.429	.113	.167	.544

Table 3
The degrees of the 5-point Likert scale

Response	Strongly agree	Agree	Natural	Disagree	Strongly disagree
Score	5	4	3	2	1
Degree of agreement	Too high	High	Medium	Low	Very low
The mean	4.20-5	3.40-4.19	2.60-3.39	1.8-2.59	1-1.79
Relative weight	Greater than 84%	68%-83.9%	52%-67%	36%-51.9%	Less than 36%

Table 4
The rank and degrees of the 5-point Likert scale

Items	Mean	Rank	Degree of agreement	Items	Mean	Rank	Degree of agreement
Item 5	4.47	1	Too high	Item 39	4.03	23	High
Item 20	4.29	2	Too high	Item 40	4.00	24	High
Item 14	4.29	3	Too high	Item 12	4.00	25	High
Item 15	4.24	4	Too high	Item 2	4.00	26	High
Item 22	4.21	5	Too high	Item 19	3.97	27	High
Item 18	4.21	6	Too high	Item 36	3.95	28	High
Item 43	4.21	7	Too high	Item 23	3.95	29	High
Item 6	4.21	8	Too high	Item 21	3.95	30	High
Item 16	4.18	9	High	Item 26	3.95	31	High
Item 17	4.18	10	High	Item 9	3.92	32	High
Item 13	4.18	11	High	Item 33	3.92	33	High
Item 11	4.18	12	High	Item 31	3.89	34	High
Item 38	4.16	13	High	Item 30	3.89	35	High
Item 37	4.16	14	High	Item 24	3.87	36	High
Item 4	4.16	15	High	Item 28	3.87	37	High
Item 35	4.13	16	High	Item 34	3.87	38	High
Item 41	4.11	17	High	Item 27	3.84	39	High
Item 1	4.08	18	High	Item 42	3.79	40	High
Item 3	4.08	19	High	Item 10	3.76	41	High
Item 25	4.05	20	High	Item 29	3.74	42	High
Item 8	4.05	21	High	Item 7	3.55	43	High
Item 32	4.05	22	High				

Table 5
One-Sample t-Test

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Item 1	37.353	36	.000	4.135	3.91	4.36
Item 2	37.115	36	.000	4.054	3.83	4.28
Item 3	35.256	36	.000	4.135	3.90	4.37
Item 4	38.149	36	.000	4.216	3.99	4.44
Item 5	39.970	36	.000	4.541	4.31	4.77
Item 6	35.478	36	.000	4.270	4.03	4.51
Item 7	25.286	36	.000	3.595	3.31	3.88
Item 8	35.772	36	.000	4.108	3.88	4.34
Item 9	30.252	36	.000	3.973	3.71	4.24
Item 10	28.584	36	.000	3.811	3.54	4.08
Item 11	37.771	36	.000	4.243	4.02	4.47
Item 12	37.115	36	.000	4.054	3.83	4.28
Item 13	37.771	36	.000	4.243	4.02	4.47
Item 14	36.990	36	.000	4.351	4.11	4.59
Item 15	37.247	36	.000	4.297	4.06	4.53
Item 16	35.706	36	.000	4.243	4.00	4.48
Item 17	40.240	36	.000	4.243	4.03	4.46
Item 18	35.478	36	.000	4.270	4.03	4.51
Item 19	33.742	36	.000	4.027	3.78	4.27
Item 20	41.803	36	.000	4.351	4.14	4.56
Item 21	36.497	36	.000	4.000	3.78	4.22
Item 22	42.739	36	.000	4.270	4.07	4.47
Item 23	32.644	36	.000	4.000	3.75	4.25
Item 24	29.982	36	.000	3.919	3.65	4.18
Item 25	38.000	36	.000	4.108	3.89	4.33
Item 26	39.016	36	.000	4.000	3.79	4.21
Item 27	36.000	36	.000	3.892	3.67	4.11
Item 28	28.746	36	.000	3.919	3.64	4.20
Item 29	28.031	36	.000	3.784	3.51	4.06
Item 30	36.126	36	.000	3.946	3.72	4.17
Item 31	38.639	36	.000	3.946	3.74	4.15
Item 32	40.705	36	.000	4.108	3.90	4.31
Item 33	40.258	36	.000	3.973	3.77	4.17
Item 34	37.233	36	.000	3.919	3.71	4.13
Item 35	41.344	36	.000	4.189	3.98	4.39
Item 36	42.143	36	.000	4.000	3.81	4.19
Item 37	40.734	36	.000	4.216	4.01	4.43
Item 38	38.149	36	.000	4.216	3.99	4.44
Item 39	36.386	36	.000	4.081	3.85	4.31
Item 40	37.115	36	.000	4.054	3.83	4.28
Item 41	36.813	36	.000	4.162	3.93	4.39
Item 42	33.944	36	.000	3.838	3.61	4.07
Item 43	42.739	36	.000	4.270	4.07	4.47

Table 5 depicts the one-sample t-test, which indicates whether there are statistically significant differences between the means ($P < 0.05$) of all the items in consideration. The t-value ranges from 25.29 to 42.74, which is larger than the tabled t-value (1.98) with a significant level of less than 0.05, indicating that the majority of the respondents perceive artificial intelligence as a tool enhancing the performance of accountants and audit firms.

4.3 Measurement model

A confirmatory factor analysis (CFA) was performed to verify the conceptual validity of the instrument's parts. Calculating each item's factor loading on the corresponding latent variable allows one to examine the dependability of each item. The factor loading exceeded 0.70, as indicated in Table 6, which supported the CFA conclusions that the scales were reliable for the variables under investigation. Additionally, the extracted average variance was used to test parallel validity (AVE). The AVE finding demonstrated the presence of convergent validity among the constructs investigated because the AVE estimate is greater than 0.5.

The reliability of the construct was examined using the Cronbach Alpha statistic, which was computed. As can be seen in Table 6, the findings of the Cronbach Alpha test suggested that the scales could be relied upon for the variables that were being investigated. Another method that was used to evaluate dependability was called composite reliability (CR). This method determines how free the items were from random error and produces consistent results. The CR finding in Table 6 provides evidence that the scales were dependable for the aspects that were being taken into consideration.

In order to determine the level of correlation between the variables, Pearson correlation has been calculated as shown in Table 7 to determine the degree of correlation.

1174

Table 6
Constructs' validity and reliability

Construct	Items	Factor loadings	Items	Factor loadings
AIP	Item 1	.962	Item 22	.961
	Item 2	.963	Item 23	.960
	Item 3	.961	Item 24	.961
	Item 4	.961	Item 25	.961
	Item 5	.962	Item 26	.961
	Item 6	.962	Item 27	.961
	Item 7	.964	Item 28	.962
	Item 8	.961	Item 29	.962
	Item 9	.962	Item 30	.961
	Item 10	.963	Item 31	.961
	Item 11	.961	Item 32	.961
	Item 12	.961	Item 33	.961
	Item 13	.961	Item 34	.960
	Item 14	.961	Item 35	.961
	Item 15	.961	Item 36	.962
	Item 16	.961	Item 37	.961
	Item 17	.961	Item 38	.961
	Item 18	.961	Item 39	.961
	Item 19	.962	Item 40	.961
	Item 20	.961	Item 41	.962
	Item 21	.961	Item 42	.961
			Item 43	.961

Cronbach's alpha	CR	AVE
.962	0.989	0.703

Table 7
Correlation matrix

	AIU	AUSFT	AUQ	PRCE	LIAU	GEND
AIU	1					
AUSFT	.406*	1				
AUQ	-.009	.138	1			
PRCE	-.060	-.102	.103	1		
LIAU	.065	.131	.142	.058	1	
GEND	.068	.156	-.138	-.020	-.086	1

Correlation is significant at the 0.01 level (2-tailed).

Table 4 shows the correlation between the variables varied from 0.406 to -0.009. The correlation matrix confirms that no multicollinearity occurs among the variables in the multiple regression because the correlation among the independent variables is less than 0.90.

4.4 Hypothesis testing

Multiple regression was used to examine the association between artificial intelligence usage and the impact of using artificial intelligence on the performance of accountants and audit firms. A multiple regression analysis was used to investigate this relationship, as shown in Table 8.

Table 8
OLS Regression Results

	Coef.	t	$P> |t|$	Tolerance	VIF
(Constant)	3.232	11.675	.000		
AIU	.219	1.779	.085	.830	1.205
AUSFT	-.380	-2.039	.050	.774	1.292
AUQ	-.393	-2.097	.044	.927	1.079
PRCE	.111	2.531	.017	.972	1.029
LIAU	.071	2.161	.039	.955	1.047
GEND	.556	3.289	.003	.942	1.062

Adjusted R^2	41.5
P-value	0.001
Model F-stat.	5.252
Durbin-Watson	2.437

Bold = significance at 1%, 5%, and 10% (one-tailed significance)

The *AIAAP* model has an F-value that is statistically significant at the 1% level. This means that the model as a whole can be interpreted. The *AIAAP* has an adjusted R^2 of 41.5%. The percentage shows that 41.5% of the total difference in the influence of artificial intelligence on the performance of accountants and audit firms can be explained by the *AIAAP* model. This shows that the *AIAAP* model is a good fit. The results show that *AIAAP* predicted artificial intelligence usage (p< 0.043, two-tailed significance). This result is in line with what previous studies have reported (Alsoulmi, 2020; Rashwan and Alhelou, 2020;

Rizk, 2020; Bygren, 2016; Assaf, 2022; Al-Rifai, 2022; Qhabeel et al., 2022; Abbad and Mubarak, 2022; Afroze & Aulad, 2020; Eltweri, 2021; Madina, 2022; Li & Zheng, 2018; Amerahom, 2022; Akinadewo, 2021; Vărzaru, 2022; Christauskas & Miseviciene, 2021; Cho et al., 2018; Qiu, 2021). Therefore, hypothesis H_1 is supported.

These results indicate that artificial intelligence applications reduce the cost, effort, and time of the audit process save cost, time and effort, achieve a competitive advantage for audit firms, help auditors better determine materiality, achieve a competitive advantage, improve the performance of the audit team, carry out the continuous audit process better than the traditional audit, enable auditors to select audit samples with high efficiency, improve the quality of control procedures on electronic transactions and files used by the client, and contribute to the management of operations and tasks with more sophisticated and intelligent mechanisms, increase the efficiency and effectiveness of the audit process and the efficiency and effectiveness of planning and supervising the audit process, enabling auditors to choose evidence of evidence properly and appropriately, and reduce uncertainty and audit risk.

The results of this study also illustrate that the implementation of artificial intelligence applications contributes to making unbiased decisions with high accuracy, offers the auditor multiple solutions and alternatives when making a decision, reduces errors that may be made in the audit process when issuing a professional opinion, increases the speed of issuing professional opinion and various reports while ensuring accuracy and confidence in their content, leads to compliance of audit firms with international accounting and auditing standards, leads to the ability of audit offices to evaluate the relationship with clients in previous periods and determine the extent to which it is possible to continue or stop with the client, helps the ability of audit firms to evaluate the acceptance of a new client, leads to the ability of audit firms to assess client risks and classify the degree of risk, helps in evaluating the effectiveness of the internal control system and the quality of its performance, leads to an assessment of the potential risks and liabilities facing the customer, assists auditors in carrying out procedures to determine the extent of material misstatements in the client's financial statements, help auditors to view laws and regulations that affect client activity, assist auditors in analytical procedures to analyze and link relationships between financial and non-financial statements for the same period and compare them with financial and non-financial information for other periods, assists auditors in analytical procedures to determine the realism of financial operations and balances, helps auditors determine the sufficiency and appropriateness of evidentiary evidence, helps auditors define detailed tests for the value of asset and liability balances, and help address differences of opinion among members of the audit team.

5. Conclusion

The objective of this study was to examine the impact of using artificial intelligence applications on the performance of accountants and audit firms in Saudi Arabia. The final sample for this study consisted of 38 audit firms. The results indicate that using artificial intelligence applications positively influences the performance of accountants and audit firms. The results show that artificial intelligence systems save cost, time, and effort, help auditors better determine materiality, achieve a competitive advantage, improve the performance of the audit team, carry out the continuous audit process better than the traditional audit, enable auditors to select audit samples with high efficiency, improve the quality of control procedures on electronic transactions and files used by the client, and contribute to the management of operations and tasks with more sophisticated and intelligent mechanisms.

The results of this study deal with ongoing and important issues that affect improving the quality of the professional performance of auditing firms and the possibility of relying on them to reach a specific concept of artificial intelligence and try to clarify the possibility of its contribution to increasing the efficiency of the performance of the external audit function, thus contributing to narrowing the expectations gap in auditing and increasing confidence in the provisions of external review. The results of this study gain importance as they keep pace with recent developments in the field of accounting research that focus on the role of artificial intelligence techniques in increasing the quality of the professional performance of audit firms and improving the quality of the services they provide. Moreover, this study provides empirical evidence in an environment where there is a lack of research on the impact of artificial intelligence on the performance of accountants and audit firms in Saudi Arabia. Further, this study benefits audit firms by introducing them to the importance of artificial intelligence techniques in increasing the quality of professional performance in a way that enhances rational decision-making and the adoption of correct information by audit firms that contributes to reducing fraud and fraud rates and identifying the strengths and weaknesses of clients.

This study is still subject to several limitations, and future research has opportunities to meet these limitations. First, the sample size of this study was 38 audit firms. Future research could increase the sample size to include as many as possible of the incorporating audit firms in Saudi Arabia. Second, this study was done with the methodology of a survey. In a future line of research, an interview could be used to get more clarification. Third, this study was conducted in Saudi Arabia. Future studies may consider replicating the same model in different GCC countries such as the United Arab Emirates, Oman, Bahrain, Kuwait, and Qatar because these countries have similar economic and cultural conditions. In conclusion, this study tested the usage of artificial intelligence applications with the performance of accountants and audit firms. A future line of research may consider additional testable variables such as the effectiveness and efficiency of the audit firms, disclosure, audit reports, and any other auditing issues.

References

Alsoulmi, N. (2020). Factors affecting the re-entry experiences of returning Saudi international students after studying abroad. *The Educational journal of the College of Education in Sohag, 69*, 1049-1093.

Afroze, D., & Aulad, A. (2020). Perception of professional accountants about the application of artificial intelligence (AI) in auditing industry of Bangladesh. *Journal of Social Economics Research, 7*(2), 51-61.

Akinadewo, I. S. (2021). Artificial Intelligence and Accountants' Approach to Accounting Functions. Covenant University Journal of Politics & International Affairs (Special Edition).

Al-Rifai, M. (2022). An analytical study to evaluate the role of artificial intelligence techniques in improving the electronic accounting disclosure process. *Journal of Administrative, Financial and Quantitative Research, 2*(2), 82-96.

Amerahom, C. (2022). The impact of using artificial intelligence applications on the future of the accounting and auditing profession. *Journal of Financial and Commercial Research, 23*(2), 244-294.

Assaf, S. (2022). Evaluating the extent to which the role of the management accountant is affected by systems based on artificial intelligence in light of the fourth industrial revolution: a field study. *Accounting Research Journal, 9*(2), 496-545.

Bygren, K. (2016). The digitalization impact on accounting firms' business models [Master of Science in Industrial Engineering and Management, Stockholm University] (Doctoral dissertation, Thesis Stockholm. https).

Cho, J. S., Ahn, S., & Jung, W. (2018). The impact of artificial intelligence on the audit market. *Korean Accounting Journal, 27*, 289-330.

Christauskas, C., & Miseviciene, R. (2012). Cloud–computing based accounting for small to medium sized business. *Engineering Economics, 23*(1), 14-21.

Elliot, V. H., Paananen, M., & Staron, M. (2020). Artificial intelligence for decision-makers. *Journal of Emerging Technologies in Accounting, 17*(1), 51-55.

Eltweri, A. (2021). The Artificial Intelligence Ethical Implications in Auditing Public Sector. *The International EFAL-IT BLOG Information Technology Innovations in Economics, Finance, Accounting and Law, 2*(1)

Emetaram, E., & Uchime, H. N. (2021). Impact of Artificial Intelligence (AI) on Accountancy Profession. *Journal of Accounting and Financial Management, 7*(2).

Li, Z., & Zheng, L. (2018, September). The impact of artificial intelligence on accounting. In 2018 4th International Conference on Social Science and Higher Education (ICSSHE 2018). Atlantis Press.

Luo, J., Meng, Q., & Cai, Y. (2018). Analysis of the impact of artificial intelligence application on the development of accounting industry. *Open Journal of Business and Management, 6*(4), 850-856.

Madina, E. (2021). Artificial intelligence in accounting and auditing. *Innovative Technologica: Methodical Research Journal, 2*(4), 1-7.

Odoh, L. C., Echefu, S. C., Ugwuanyi, U. B., & Chukwuani, N. V. (2018). Effect of artificial intelligence on the performance of accounting operations among accounting firms in South East Nigeria. *Asian Journal of Economics, Business and Accounting, 7*(2), 1-11.

Qhabeel, S., Hafez, S. & Sadah, E. (2022). A proposed model for reviewing performance to predict financial corruption among listed companies on the Egyptian stock market using data mining technique: Empirical study. *Egyptian Journal of Commercial Studies, 46*(4), 467-530.

Qiu, J. (2021). Analysis of human interactive accounting management information systems based on artificial intelligence. *Journal of Global Information Management (JGIM), 30*(7), 1-13.

Rashwan, A. R. M., & Alhelou, E. M. (2020). The impact of using artificial intelligence on the accounting and auditing profession in light of the Corona pandemic. *Journal of Advance Research in Business Management and Accounting*.

Rizk, A. (2020). The contribution of artificial intelligence technologies in supporting the quality of professional performance of accounting and auditing firms in Egypt: Empirical study on large accounting and auditing firms. *Accounting Thought, 24*(2), 480-563.

Shi, Y. (2020). The impact of artificial intelligence on the accounting industry. In Cyber Security Intelligence and Analytics (pp. 971-978). Springer International Publishing.

Vărzaru, A. A. (2022). Assessing Artificial Intelligence Technology Acceptance in Managerial Accounting. *Electronics, 11*(14), 2256.

Appendix 1

The questionnaire of the survey

AI1:	AI systems aim to direct the computer to do things that humans do
AI2:	AI systems are characterized by superior capabilities to simulate reality
AI3:	AI systems implement activities with high accuracy
AI4:	AI systems provide high-accuracy results
AI5:	AI systems save cost, time, and effort
AI6:	AI systems contribute to the management of operations and tasks with more sophisticated and intelligent mechanisms
AI7:	AI systems can deal with difficult and complex cases in the absence of the necessary data and information
AI8:	AI systems can understand inputs and transform them to provide outputs that meet user needs with high efficiency
AI9:	AI systems can use past experiences and employ them in future operations
AI10:	AI systems work on visualization, creativity, and understanding and perceiving visual matters
AI11:	The audit firm's adoption of artificial intelligence techniques improves the quality of the professional performance of the auditors
AI12:	The use of artificial intelligence techniques provides accurate and appropriate solutions to difficult problems
AI13:	The use of artificial intelligence techniques reduces the cost, effort, and time of the audit process
AI14:	The use of artificial intelligence techniques achieves a competitive advantage for the audit firm
AI15:	The use of artificial intelligence techniques improves the performance of the audit team
AI16:	The use of artificial intelligence techniques increases the efficiency and effectiveness of the audit process
AI17:	The use of artificial intelligence techniques increases the efficiency and effectiveness of planning and supervising the audit process
AI18:	The use of artificial intelligence techniques enables auditors to select audit samples with high efficiency
AI19:	The use of artificial intelligence techniques enables auditors to choose evidence properly and appropriately
AI20:	The use of AI techniques helps auditors better determine materiality
AI21:	The use of artificial intelligence techniques reduces uncertainty and audit risk
AI22:	The use of artificial intelligence techniques helps auditors carry out the continuous audit process better than the traditional audit
AI23:	The use of artificial intelligence techniques contributes to making unbiased decisions with high accuracy
AI24:	Artificial intelligence techniques offer the auditor multiple solutions and alternatives when making a decision
AI25:	The use of artificial intelligence techniques reduces errors that may be made in the audit process when issuing a professional opinion
AI26:	The use of artificial intelligence techniques increases the speed of issuing professional opinions and various reports while ensuring accuracy and confidence in their content
AI27:	The use of artificial intelligence techniques leads to the compliance of audit firms with international accounting and auditing standards
AI28:	The use of artificial intelligence techniques leads to the ability of audit firms to evaluate the relationship with clients in previous periods and determine the extent to which it is possible to continue or stop working with the client.
AI29:	Artificial intelligence techniques improve the ability of audit firms to evaluate the acceptance of a new client
AI30:	The use of artificial intelligence techniques leads to the ability of audit firms to assess client risks and classify the degree of risk
AI31:	The use of artificial intelligence techniques helps confirm and correct predictions
AI32:	The use of artificial intelligence techniques helps in evaluating the effectiveness of the internal control system and the quality of its performance
AI33:	The use of artificial intelligence techniques is in line with the rules and principles of the auditing profession in many important aspects, such as exercising accuracy and due diligence in the examination.
AI34:	The use of artificial intelligence techniques leads to an assessment of the potential risks and liabilities facing the customer
AI35:	Artificial intelligence techniques assist auditors in carrying out procedures to determine the extent of material misstatements in the client's financial statements.
AI36:	Artificial intelligence technologies help auditors view laws and regulations that affect client activity

| AI37: | Artificial intelligence techniques assist auditors in analytical procedures to analyze and link relationships between financial and non-financial statements for the same period and compare them with financial and non-financial information for other periods. |

| AI38: | Artificial intelligence techniques assist auditors in analytical procedures to determine the realism of financial operations and balances |

| AI39: | Artificial intelligence techniques help auditors determine the sufficiency and appropriateness of evidentiary evidence |

| AI40: | Artificial intelligence techniques help auditors define detailed tests for the value of asset and liability balances |

| AI41: | Artificial intelligence techniques help auditors ask questions to the audit team to ensure their compliance with the rules of professional conduct and ethics. |

| AI42: | Artificial intelligence techniques help address differences of opinion among members of the audit team |

| AI43: | The use of artificial intelligence techniques improves the quality of control procedures for electronic transactions and files used by the client. |