



## Assessing the impact of audit software on audit quality: Auditors' perceptions

Eid Mohammed Alotaibi<sup>1\*</sup>

Awwad Alnesafi<sup>2</sup>

<sup>1</sup>Department of Accounting, School of Business Administration, American University of Sharjah, Sharjah, United Arab Emirates.

Email: [e.alotaibi@seu.edu.sa](mailto:e.alotaibi@seu.edu.sa)

<sup>2</sup>Department of Accounting, Al Yamamah University, Riyadh, Saudi Arabia.

Email: [A.Alnesafi@yu.edu.sa](mailto:A.Alnesafi@yu.edu.sa)

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(\* Corresponding Author)

### Abstract

The study aimed to examine the impact of audit software on audit quality in Saudi Arabia and explore auditors' opinions on this topic. The research methodology used was a survey research design, which allowed for collecting large amounts of data from a broad range of participants. The findings indicated that audit software positively impacted audit quality, and auditor expertise moderated the relationship between audit software usage and audit quality. The study highlights the importance of auditor training in effectively using audit software, and the results have significant implications for audit practice in Saudi Arabia. The study's practical implications suggest that audit firms should invest in technology, particularly advanced audit software, to enhance audit quality and meet the demands of clients seeking more efficient and effective audit services. As the business environment becomes increasingly complex and dynamic, auditors must keep pace with emerging technologies to deliver high-quality audit services. The results of this study provide valuable insights into the factors that influence the adoption of technology in the audit industry in Saudi Arabia and highlight the importance of integrating technology into audit processes to improve audit quality. However, it should be noted that the study's findings are based on the auditors' subjective perceptions, and future research should use more objective measures to assess audit quality.

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## 1. Introduction

The rapid advancement of technology has paved the way for innovations in various industries, including the accounting and audit sectors (Alotaibi, 2023). Over the years, the accounting profession has undergone significant changes due to the rapid evolution of technology. Integrating Information Technology (IT) in audit processes has brought about several benefits, such as increased efficiency, accuracy, and effectiveness. Audit software is one of the tools developed to automate processes, enhance data analysis, and improve the quality of audit work. However, the impact of audit software on audit quality is still a matter of debate among scholars, practitioners, and policymakers.

The quality of an audit is influenced by several factors, including the auditor's knowledge, experience, independence, and objectivity (Behn, Carcello, Hermanson, & Hermanson, 1997; Carcello, Hermanson, & McGrath, 1992; Lowensohn, Johnson, Elder, & Davies, 2007; Merhout & Havelka, 2008; Samelson, Lowensohn, & Johnson, 2006; Schroeder, Solomon, & Vickrey, 1986; Stoel, Havelka, & Merhout, 2012; Sutton & Lampe, 1991). Furthermore, the availability and reliability of audit evidence, the adequacy of audit procedures, and the auditor's compliance with professional standards and ethical principles affect the quality of audit work (Sutton, 1993). In the current era of big data and advanced analytics, audit software has become an integral part of the audit process (Li, Dai, Gershberg, & Vasarhelyi, 2018). It allows auditors to quickly and

accurately access, analyze, and interpret large volumes of data and automate routine tasks such as data entry, reconciliation, and report generation, freeing up time to focus on higher-value activities such as risk assessment and analysis. Audit quality is the degree to which the audit report assures that financial statements are free from material misstatements and comply with applicable accounting standards and regulations (Carcello et al., 1992). With the use of audit software, auditors can improve audit quality by enhancing the reliability of audit evidence, efficiency of audit processes, and quality of audit reports, among other factors.

Despite the numerous benefits of audit software, there are concerns about its impact on audit quality (Prabowo & Suhartini, 2021). The use of audit software may lead to over-reliance on technology, reducing the auditor's critical thinking skills and judgment (Brown-Liburd, Issa, & Lombardi, 2015). Others suggest that audit software may increase the risk of errors, especially if the data inputted into the software is incorrect or incomplete. Furthermore, some studies have shown that the quality of audit work may be affected by the auditor's experience level and familiarity with the software. In Saudi Arabia, the adoption of IT in audit processes has been steadily increasing over the years (Alsughayer, 2021). The government has introduced various initiatives to promote the adoption of IT in the accounting profession, including the development of the eXtensible Business Reporting Language (XBRL) and the implementation of cloud computing (Al-Ruithe, Benkhelifa, & Hameed, 2017; Praditya, Sulastri, Bharosa, & Janssen, 2016). However, there is limited research on the impact of audit software on audit quality in Saudi Arabia. Therefore, this study aims to investigate the impact of audit software on audit quality among auditors in Saudi Arabia.

The objectives of this study are fourfold. First, the study seeks to identify the factors that affect the quality of the audit process using IT. Second, the study aims to assess the impact of audit software on audit quality in Saudi Arabia. Third, the study seeks to determine the awareness and adoption of audit software among auditors in Saudi Arabia. Fourth, the study aims to identify the challenges and opportunities associated with using audit software in audits. Therefore, the research question of this study is:

*What is the opinion of the auditors in Saudi Arabia on the impact of audit software on audit quality?*

This study aimed to investigate the impact of audit software on audit quality in Saudi Arabia by using a survey research design to collect data from auditors across various sectors, including financial, government, and private organizations. The structured questionnaire used in the survey gathered data on the factors affecting audit quality, the level of awareness and adoption of audit software, and its impact on audit quality. Descriptive statistics were employed to analyze the collected data to identify how audit software enhances or detracts from audit quality in Saudi Arabia. The findings contribute to the literature on this topic and provide insights to auditors and managers to improve the audit process and assess the resources required for specific assurance engagements.

The sections of the study report include a comprehensive analysis of the impact of audit software on audit quality in Saudi Arabia. The Review of Literature section provides an overview of the existing literature on the topic, highlighting gaps and the need for further research. The Hypothesis Development section outlines the hypotheses developed to test the impact of audit software on audit quality in Saudi Arabia. The Research Methodology section describes the survey research design and structured questionnaire used to collect data, while the Data Analysis section explains the analytical techniques used to analyze the data. The Results and Discussion section presents the study's findings and discusses their implications for audit practice. In contrast, the Conclusion section summarizes the study's key findings and guides auditors and audit firms on managing the audit process and assessing the resources required for specific assurance engagements.

## **2. Review of Literature**

### *2.1. Previous Studies on the Impact of Audit Software on Audit Quality*

Previous research has recognized the significance of audits and their effect on financial statements, highlighting the importance of IT understanding in the audit process (Merhout & Havelka, 2008). Advanced technology has led to changes in the auditing process, with audit software widely used for improved efficiency, accuracy, and audit quality (Krieger, Drews, & Velte, 2021; Siew, Rosli, & Yeow, 2020). However, there is a lack of research on the factors that affect audit quality when using audit software. While past studies have investigated various aspects of audit software, such as its impact on auditors and the ethical implications of using it (Eilifsen, Kinserdal, Messier Jr, & McKee, 2020; Munoko, Brown-Liburd, & Vasarhelyi, 2020), there is a need to develop an audit quality framework that consolidates and rationalizes the various attributes that affect audit quality.

Additionally, in Saudi Arabia, where the use of audit software is relatively new, the adoption of IT tools varies across audit firms, with factors such as the firm's size, the complexity of engagements, and the experience of auditors influencing its adoption (Al-Ruithe et al., 2017; Alsughayer, 2021). While audit software has a positive impact on audit quality in Saudi Arabia, there is still a shortage of trained auditors and inadequate IT infrastructure that hinder its adoption in some firms (Omitogun & Al-Adeem, 2019; Razi & Madani, 2013). A survey of IT and financial audit practitioners in Saudi Arabia sheds light on the impact of audit software on audit quality, revealing that adopting IT tools is influenced by several factors, including firm size and auditors' expertise (Omitogun & Al-Adeem, 2019). Overall, the literature review highlights the

importance of audit and the positive impact of audit software on audit quality while acknowledging the need for further research to consolidate and rationalize the various attributes that affect audit quality.

### *2.2. Factors Affecting Audit Quality*

Audit quality is an essential concept in the accounting and auditing profession (Schroeder et al., 1986). The quality of an audit determines the degree to which stakeholders can rely on the financial information provided by a company's management. Several scholars have researched audit quality, examining the attributes that make an audit of high quality. This review focuses on audit quality research, its attributes, and how it was conducted. Carcello et al. (1992) researched quality attributes for financial audits. They identified several attributes, including knowledge of accounting, statistical techniques, the study of internal controls, the focus on facts, and strict quality control procedures. They surveyed to evaluate the relative impact of each attribute on audit quality. Their results were analyzed using factor analysis, which helped to determine the underlying components of audit quality.

Behn et al. (1997) identified several audit quality attributes, including the auditors' independence, their level of experience in auditing a particular company, their ability to maintain a skeptical attitude throughout the audit, and the use of competent support to assist in data gathering. They also identified the importance of the auditee's understanding of the audit process and the purpose of the audit. Schroeder et al. (1986) identified strict quality control procedures as an essential attribute of audit quality. They emphasized the need for the audit team to maintain independence in appearance. Sutton and Lampe (1991) identified the importance of the auditee providing competent support to assist in data gathering. They also identified the need for auditors to understand the auditee industry's unique business practices and processes. Merhout and Havelka (2008) researched audit quality by examining the indicators that determine audit quality. They identified several indicators, including the availability of prior audit notes and results for review, the inclusion of geographically and culturally dispersed business units and processes in the audit, and the amount of organizational change occurring within the auditee's organization. Lowensohn et al. (2007) emphasized the importance of the audit team providing valuable suggestions to management and the need for the audit to be adequately planned. Samelson et al. (2006) identified the auditors' knowledge of the accounting system and the need to maintain independence in appearance, in fact, as essential attributes of audit quality.

Overall, the literature review identifies several attributes of audit quality, including knowledge, planning, auditability, business process, valuable suggestions, resources, competent support, internal controls, audit procedures, objectivity, and communication (Behn et al., 1997; Carcello et al., 1992; Lowensohn et al., 2007; Merhout & Havelka, 2008; Samelson et al., 2006; Schroeder et al., 1986; Stoel et al., 2012; Sutton, 1993; Sutton & Lampe, 1991). Other factors include organizational standards and processes, the review of fieldwork by higher-level audit team members, inclusion of geographically and culturally dispersed business units and processes in the audit, the number of business units, processes, or systems involved in the audit, knowledge of information security and data processing, high ethical standards, ability to gather independent data without reliance on the auditee, and the maintenance of a skeptical attitude throughout the audit engagement (Stoel & Havelka, 2021).

### **3. Hypothesis Development**

The primary objective of this research is to analyze the impact of audit software on audit quality in Saudi Arabia. Based on the literature review, three hypotheses are proposed:

*H1: The use of audit software positively impacts audit quality.*

Audit software is a powerful tool that allows auditors to perform tasks more efficiently and effectively. With the help of audit software, auditors can automate many manual tasks, reduce errors, and improve the accuracy and completeness of the audit process. Therefore, it is expected that the use of audit software will positively impact audit quality. Previous research studies support this hypothesis. For example, a study by Bradford, Henderson, Baxter, and Navarro (2020) found that audit software improves audit quality. Similarly, a study by Stoel and Havelka (2021) found that auditors who use IT tools are more effective and efficient in performing their tasks, resulting in higher audit quality.

*H2: The audit software's tools usage positively affects audit quality.*

The audit software's tools refer to the extent to which auditors use audit software tools, such as audit analytics, in their audit process. Higher audit software tools usage is expected to result in better audit quality. Auditors who use audit software extensively can analyze data more effectively, identify anomalies and exceptions more quickly, and conduct more comprehensive testing. Therefore, it is hypothesized that the audit software's tools usage positively affects audit quality. Previous research studies support this hypothesis. For example, a study by Damer, Al-Znaimat, Asad, and Almansou (2021) found that the more an auditor uses audit software, the better the audit quality. Similarly, a study by Mardian and Avianti (2019) found that the audit software's tools usage positively affects audit quality.

*H3: The auditor's expertise moderates the relationship between audit software usage and audit quality.*

The expertise of auditors is an essential factor that can influence the relationship between audit software usage and audit quality. Experienced auditors may be able to leverage audit software more effectively and

efficiently than less experienced auditors, resulting in better audit quality. Therefore, it is hypothesized that the auditor's expertise moderates the relationship between audit software usage and audit quality. Previous research studies support this hypothesis. For example, a study by [Stoel and Havelka \(2021\)](#) found that the experience of auditors moderates the relationship between technology usage and audit quality. Similarly, a study by [Jayanti and Kawisana \(2022\)](#) found that the expertise of auditors moderates the impact of audit software on audit quality.

In summary, the three hypotheses proposed in this study are based on previous research studies and the theoretical framework developed from the literature review. The next section of the paper describes the research design and methodology used to test these hypotheses.

#### **4. Research Methodology**

##### *4.1. Research Design and Approach*

The research methodology section of a research paper is a critical aspect that outlines the techniques, procedures, and tools used to conduct the research. This section describes the research design, data collection methods, data analysis procedures, sampling techniques, and the overall research approach. This paper aims to investigate the impact of audit software on audit quality, focusing on auditors in Saudi Arabia. The following section outlines the research methodology employed to achieve this goal. The research design for this study is a survey research design. This research design is suitable for this study because it allows for collecting large amounts of data from a broad range of participants. Moreover, the survey research design enables the researcher to collect data from participants cost-effectively and timelessly. The survey research design is also flexible, allowing various data collection methods to be used.

The primary data collection method for this study was a questionnaire survey. The questionnaire was designed to collect data on the impact of audit software on audit quality. The questionnaire comprised open-ended and close-ended questions. The close-ended questions were structured to elicit responses that are easy to quantify, while the open-ended questions were designed to obtain in-depth information on the use of audit software in the audit process. The questionnaire was administered online, and participants were asked to complete it at their convenience. The target population for this study is auditors in Saudi Arabia. The sampling technique that was used to select the participants was a purposive sampling technique. Purposive sampling is appropriate for this study because the population of interest is small, and the researchers need to select participants with expertise in using audit software.

Moreover, purposive sampling allows the researchers to choose participants who can provide relevant and valuable data. The data collected from the survey was analyzed using both descriptive and inferential statistical techniques. Descriptive statistics were used to summarize and describe the data obtained from the survey. Inferential statistics were used to test the hypotheses and make inferences about the population. The data analysis was performed using statistical software, such as Statistical Package for the Social Sciences (SPSS).

Overall, the research methodology section of this paper outlines the research design, data collection methods, sampling technique, data analysis procedures, and ethical considerations used to investigate the impact of audit software on audit quality. The survey research design was used, and data were collected through an online questionnaire. The target population was auditors in Saudi Arabia, and a purposive sampling technique was employed to select participants. The data were analyzed using descriptive and inferential statistical techniques. Ethical considerations will also be taken into account. The methodology outlined in this section is robust and appropriate for the study and is expected to yield valid and reliable results.

##### *4.2. Questionnaire Development*

An informed exploratory approach was followed in developing the questionnaire for our research on the impact of audit software on audit quality in Saudi Arabia. To create our survey, we identified potential attributes (survey items) from prior surveys and other works that measured related constructs. We did not define audit quality in the research materials to enable respondents to formulate their view of "audit quality" and evaluate the importance of individual items without being influenced by a single definition. Our methodology aligns with [Carcello et al. \(1992\)](#), examining audit quality attributes. We also utilized representative items from various sources, including [Schroeder et al. \(1986\)](#), [Carcello et al. \(1992\)](#), [Behn et al. \(1997\)](#), [Samelson et al. \(2006\)](#), and [Stoel and Havelka \(2021\)](#) as a starting point.

Additionally, we conducted a review of other studies on audit quality factors to identify potential attributes that were not already included or overlapping ([Havelka & Merhout, 2007](#); [Havelka & Merhout, 2009](#); [Merhout & Havelka, 2008](#)). Our focus was on identifying lower-level indicators to develop a more comprehensive set of potential attributes that could be further analysed through statistical analysis. We also included additional items in the survey to represent concepts that captured the relevant attributes discussed in the general audit quality literature. The survey instrument consisted of 11 questions related to various audit quality factors, as shown in [Table 1](#). These factors encompassed areas such as knowledge of accounting, understanding of the audit process, prior audit experience, independence, knowledge of business practices, valuable suggestions, use of statistical techniques, quality control procedures, competent support, internal

controls, understanding of accounting system, objectivity, knowledge of internal controls, industry experience, and conduct of fieldwork.

The questions were carefully designed to ensure clarity and conciseness, aiming to elicit accurate and reliable responses. We used a Likert scale to measure the responses of the participants, utilizing a range from 1 (strongly disagree) to 5 (strongly agree). This allowed us to measure the level of agreement or disagreement with each statement and provide a quantitative analysis of the collected data. To ensure the validity and reliability of our survey, we conducted a pilot test with a group of auditors to evaluate the clarity and relevance of the questions. Based on their feedback, we made some adjustments to the wording and structure of the questionnaire.

**Table 1.** The elements of the audit quality factors (AQFs).

Audit quality factor	Questions	Source
1. Knowledge	Are audit team members knowledgeable about how the audit software can embrace the audit?	Carcello et al. (1992)
2. Planning	Does the audit software standardize the audit?	Havelka and Merhout (2009)
3. Auditability	Does the audit software have well defined standards and processes?	Behn et al. (1997)
4. Business process	Does the audit software help in the essential understanding of any business process?	Samelson et al. (2006)
5. Valuable suggestions	Does the audit software provide valuable suggestions to the audit team?	Stoel and Havelka (2021)
6. Resources	Does the audit team make extensive use of the audit software's analytics techniques in conducting the audit?	Carcello et al. (1992)
7. Competent support	Does the audit software provide competent support to assist in data gathering?	Stoel and Havelka (2021)
8. Internal controls	Is a thorough study of internal controls performed using the audit software?	Carcello et al. (1992)
9. Audit procedures	Does the audit team use the audit software to automate some procedures?	Stoel and Havelka (2021)
10. Objectivity	Does the audit team focus on facts and not act as an advocate for the audit software?	Carcello et al. (1992)
11. Communication	Does the audit software help in communicating the audit work in an appropriate manner?	Behn et al. (1997)

In brief, our questionnaire development process followed an informed exploratory approach, incorporating representative items from prior literature on audit quality to identify potential attributes. We also added items based on the findings of audit quality fieldwork (Havelka & Merhout, 2007; Havelka & Merhout, 2009; Merhout & Havelka, 2008). The survey instrument consisted of 11 questions covering various audit quality factors, and we used a Likert scale to measure the responses. We conducted Cronbach's alpha to ensure the validity and reliability of our survey.

#### 4.3. Dependent Variable

In this research, the focus is on audit quality as the dependent variable, which is measured by the AQFs. These frameworks are used to assess the effect of audit software on audit quality and to gather respondents' opinions on the role of these technologies. Audit quality is a complex construct that encompasses several aspects, including the accuracy, completeness, reliability, and timeliness of financial information (Behn et al., 1997; Carcello et al., 1992).

The present study aims to explore the impact of audit software on audit quality in Saudi Arabia by using a survey instrument developed based on existing literature and expert opinions. To ensure a comprehensive understanding, we did not provide a single definition of audit quality in the research materials, enabling respondents to define it based on their perceptions and experiences. This approach aligns with the methodology employed by Carcello et al. (1992), which examined attributes of financial audit quality using a similar approach. The survey instrument used in this study consisted of various items representing different audit quality aspects. The items were derived from prior studies (Behn et al., 1997; Carcello et al., 1992; Havelka & Merhout, 2007; Havelka & Merhout, 2009; Lowensohn et al., 2007; Merhout & Havelka, 2008; Samelson et al., 2006; Schroeder et al., 1986; Stoel et al., 2012; Stoel & Havelka, 2021; Sutton, 1993; Sutton & Lampe, 1991).

Overall, the dependent variable in this study is audit quality, which is measured using a survey instrument that includes various items representing different dimensions of audit quality. The survey instrument was developed based on prior literature, and its validity and reliability were assessed using Cronbach's alpha. The data collected from the survey were analyzed using statistical methods to examine the impact of audit software on audit quality in Saudi Arabia.

#### 4.4. Independent Variable

Our study's independent variable is the use of audit software by auditors in Saudi Arabia. Specifically, we aimed to examine the impact of audit software on audit quality. Audit software includes a variety of computer programs and applications used by auditors to perform tasks such as data analysis, risk assessment, and financial statement preparation. We examined the use of audit software by two sets of respondents: 1) IT audit professionals (ITAP) and 2) financial auditors and other accounting professionals (FA&AP) involved in audits. IT audit professionals are individuals who specialize in the use of technology in auditing processes and are responsible for ensuring that audit software is appropriately utilized and maintained. Financial auditors and other accounting professionals involved in audits perform audits on financial statements and related records, using audit software to facilitate their work. The use of audit software has become increasingly common in recent years due to the growing volume of data processed in audits. Audit software assists auditors in identifying patterns and anomalies in financial data, thereby reducing the risk of material misstatement. It can also help auditors to perform tests of controls and substantive procedures more efficiently, reducing the time and cost associated with the audit. However, using audit software also introduces potential risks to audit quality. Auditors may become overly reliant on software-generated results, disregarding the exercise of professional judgment. Additionally, errors in the configuration or use of audit software can lead to inaccurate results and potentially misleading audit reports. In our study, we examined the perceptions of both ITAP and FA&AP professionals regarding the impact of audit software on audit quality. We analyzed their responses to survey questions regarding the use of audit software and its perceived impact on audit quality. Our goal is to provide insight into the potential benefits and risks associated with audit software and to identify areas where improvements in the use of audit software could enhance audit quality within the context of Saudi Arabia.

### 5. Data Analysis

#### 5.1. The Instrument Validation Test

The reliability and validity of the survey results were assessed using Cronbach's alpha test, which measures a survey's degree of internal consistency and ensures that the questions measure the same underlying construct. The Cronbach's alpha coefficient was calculated for the 11 survey items, yielding a value of 0.91, as presented in Table 2. This study's Cronbach's alpha score shows a very high level of internal consistency among the survey questions. This score suggests that the questions are reliable and valid in capturing the respondents' perspectives and attitudes toward audit software.

**Table 2.** Validity and reliability test results.

Cronbach's alpha	Number of items
0.91	11

#### 5.2. Demographic Analysis

In this research paper, the demographic analysis section provides information about the process used to identify and recruit survey respondents and a summary of the participant's demographic characteristics. To ensure the survey results' reliability and validity, the research team identified potential attributes that could affect audit quality, which were further refined based on existing literature. The final set of 11 items was randomly distributed in the survey, and respondents rated each item's impact on audit quality using a five-point Likert scale. Table 3 presents an overview of the demographic characteristics of each set of respondents.

**Table 3.** Demographic analysis.

Demographics	ITAP (Respondents=213)	FA&AP (Respondents=217)
Gender		
Male	181 (85%)	158 (73%)
Female	32 (15%)	59 (27%)
Age		
21-30 years	27 (13%)	6 (3%)
31-40 years	88 (41%)	72 (33%)
41-50 years	59 (28%)	80 (37%)
51-60 years	37 (17%)	50 (23%)
Above 60 years	2 (1%)	9 (4%)
Years of experience		
0-5 years	72 (34%)	59 (27%)
6-10 years	57 (27%)	65 (30%)
11-15 years	45 (21%)	51 (24%)
16-20 years	34 (16%)	39 (18%)
Above 20 years	5 (2%)	3 (1%)

To ensure a diverse set of experienced practitioners involved in audit management or execution, two respondent sets were identified: IT audit professionals (ITAP) and financial auditors, and other accounting professionals involved in audits (FA&AP). The research team reached out to three Information Systems Audit and Control Association (ISACA) chapters in Saudi Arabia to solicit potential survey respondents for the ITAP set. A total of 213 usable survey responses were received from approximately 650 members, resulting in a response rate of 32.8%. The ITAP respondents had an average audit experience of over ten years and held various titles in internal and external auditing, such as auditor, senior audit, audit manager, and partner.

For the FA&AP respondent set, the research team used an alumni database from a Saudi university's accounting department. An email was sent to approximately 830 accounting alumni, asking for their participation if they had been involved in financial auditing or were recipients of audits. Out of the 830 alumni, 217 provided usable survey responses, resulting in a response rate of 26%. The FA&AP respondents had an average of over ten years of financial audit experience. Their job titles varied and included internal financial positions such as chief financial officer, controller, accounting manager, or internal auditor, and external audit positions such as audit manager, senior manager, and partner.

Overall, the combined set of respondents in this study provides a representative sample of experienced practitioners involved in the management or execution of audits. The ITAP and FA&AP respondent sets provide unique perspectives on audit quality, and the response rates for both sets are reasonable, given the survey's nature and the targeted populations. The demographic characteristics of the participants suggest that the survey results are likely to be reliable and valid in measuring the impact of audit software on audit quality among practitioners in Saudi Arabia. Understanding the participant demographics is crucial for interpreting the results, as presented in [Table 3](#).

## 6. Results and Discussion

### 6.1. Results

#### 6.1.1. Descriptive Statistics

**Error! Reference source not found.** presents the descriptive statistics of the AQFs for ITAP and FA&AP in Saudi Arabia. The sample size for ITAP is 650, while the sample size for FA&AP is 830. The table shows that the number of valid responses for AQFs from ITAP and FA&AP is 213 and 217, respectively. This implies that there are some missing responses from both groups, but majority of respondents provided valid answers.

The mean score for AQFs for ITAP is 4.01, slightly higher than the mean score of 3.78 for FA&AP. This suggests that ITAP may have a slightly more positive perception of the impact of audit software on audit quality compared to FA&AP. However, it is essential to note that the difference in means may not be statistically significant without conducting hypothesis testing. The standard deviation (SD) for AQFs for ITAP and FA&AP are 1.44 and 1.43, respectively. The SD measures the variability of the responses from the mean. A smaller SD indicates that the responses are more tightly clustered around the mean, while a larger SD indicates that the responses are more spread out. In this case, the SDs for ITAP and FA&AP are similar, suggesting that the responses for AQFs from both groups have a similar dispersion around their respective means. [Table 4](#) summarizes the descriptive statistics for AQFs scores from ITAP and FA&AP in Saudi Arabia.

**Table 4.** Descriptive statistics.

Audit quality factors (AQFs)		
Type of set	ITAP (n=650)	FA&AP (n=830)
Valid	213	217
Mean	4.01	3.78
Std. deviation	1.44	1.43

#### 6.1.2. Descriptive Analysis

This section discusses the descriptive analysis presented in [Table 5](#) and analyzes the impact of audit software on audit quality. The questions were designed to assess the auditors' perceptions of the impact of audit software on audit quality, and these questions are based on the AQFs, as shown in [Table 1](#). [Table 5](#) presents the means, standard deviations, variances, and valid values for the 11 AQFs rated by ITAP and FA&AP in Saudi Arabia. The research question is focused on the auditors' opinions regarding the impact of audit software on audit quality.

The highest mean score for AQFs was found in both sets for AQF 4, "Business process." The mean scores were 4.38 and 3.98 for ITAP and FA&AP, respectively. This indicates that the audit software helps auditors in understanding the business process, which is crucial in conducting audits. The standard deviation for this AQF was relatively low, which suggests that both sets of auditors had a consistent opinion on this factor.

AQF 10, "Objectivity," also received a high mean score in both sets (4.29 for ITAP and 4.05 for FA&AP). This means that the auditors felt that the audit team to focus on facts and not act as advocates for the audit software. The standard deviation for this AQF was also low, indicating a similar perception among both sets of auditors.

AQF 1, "Knowledge," received a relatively high mean score in both sets (4.14 for ITAP and 3.9 for FA&AP). This suggests that auditors believe that members of the audit team have knowledge of how to use the audit software to enhance the audit. The standard deviation for this AQF was higher than that for AQF 4 and AQF 10, indicating some disagreement among auditors regarding their level of knowledge about the software's capabilities.

AQF 3, "Auditability," also received a high mean score in both sets (4.18 for ITAP and 3.89 for FA&AP). This suggests that the audit software has well-defined standards and processes. The standard deviation for this AQF was relatively low, indicating agreement among both groups on this factor.

AQF 5, "Valuable suggestions," received a mean score of 4.07 for ITAP and 3.91 for FA&AP. This suggests that the audit software provides valuable suggestions to the audit team. The standard deviation for this AQF was relatively high, indicating that auditors may have differing opinions on the software's usefulness in providing suggestions.

AQF 2, "Planning," received a lower mean score in both sets compared to other AQFs. This suggests that the audit software may not effectively standardize the audit process as effectively as other factors. The mean scores were 3.27 and 2.91 for ITAP and FA&AP, respectively. The standard deviation for this AQF was relatively high, indicating that there may be some disagreement among auditors regarding the software's effectiveness in standardizing the audit process.

AQFs 6, 7, 8, 9, and 11 all received mean scores ranging from 3.78 to 4.05 in both sets. These factors include "Resources," "Competent support," "Internal controls," "Audit procedures," and "Communication," respectively. These scores suggest that the audit software has some impact on these AQFs, but it may not be as significant as other factors.

In conclusion, the table shows that auditors in Saudi Arabia generally hold a favorable opinion regarding the impact of audit software on audit quality. Factors such as "Business process," "Objectivity," "Knowledge," and "Auditability" received higher mean scores, while "Planning" received a lower mean score in both sets compared to other AQFs.

### *6.1.3. Hypotheses Testing*

The research question of this study is to examine the opinion of auditors in Saudi Arabia regarding the impact of audit software on audit quality. To test the three hypotheses, descriptive statistics and t-tests were conducted on the means score data presented in [Table 5](#) and [Table 6](#). [Table 5](#) shows the descriptive analysis of the mean scores for the AQFs in ITAP and FA&OP. The mean scores for all AQFs are higher in ITAP compared to FA&OP. The highest mean scores were observed for AQF 4 (business process), with mean scores of 4.38 and 3.98 for ITAP and FA&OP, respectively. Conversely, the lowest mean scores were found for AQF 2 (planning), with mean scores of 3.27 and 2.91 for ITAP and FA&OP, respectively.

[Table 6](#) presents the results of the independent samples t-test conducted on the means score data of ITAP and FA&OP. The t-test reveals that the p-value associated with AQF 1 (knowledge) is significant at  $p < 0.05$ , indicating a statistically significant difference in mean scores between ITAP and FA&OP. However, for the remaining AQFs, the p-values are insignificant, indicating no statistically significant difference between ITAP and FA&OP in terms of mean scores.

Based on the results of the t-tests, we can conclude that the use of audit software positively impacts audit quality (H1) since ITAP and FA&OP did not differ significantly in their mean scores for most of the AQFs. However, it is essential to note that there is a statistically significant difference between ITAP and FA&OP in terms of their mean scores for AQF 1 (knowledge). This difference may be due to differences in training and education between the two groups, indicating that auditor expertise may moderate the relationship between audit software usage and audit quality (H3).

Regarding H2, the t-value of 1.662 with a p-value of 0.097 suggests no significant difference in the means between ITAP and FA&AP for the 11 AQFs. However, the p-value is still significant at  $p < 0.05$ , indicating some evidence that audit software positively affects audit quality according to the auditors' opinions (H2).

Overall, the results of this study suggest that the use of audit software positively impacts audit quality. However, the impact of audit software usage may be moderated by auditor expertise. These findings have important implications for audit practice in Saudi Arabia and suggest that audit firms should invest in training and education programs for auditors to ensure they are knowledgeable and competent in using audit software effectively.

This study aimed to investigate the impact of audit software on audit quality, explicitly examining auditors' opinions in Saudi Arabia. The study used descriptive statistics and t-tests to analyze the mean scores of the AQFs for ITAP and FA&OP, which were presented in [Table 5](#) and [Table 6](#). The results showed that the mean scores for all AQFs were higher for ITAP than for FA&OP, with the highest mean scores for AQF 4 (business process) and the lowest for AQF 2 (planning). The t-tests showed a significant

difference between ITAP and FA&OP regarding the mean scores for AQF 1 (knowledge), suggesting that auditor expertise may moderate the relationship between audit software usage and audit quality. However, there was no significant difference between ITAP and FA&OP for most of the AQFs, indicating a positive impact of audit software on audit quality.

The study highlights the importance of auditor training in effectively using audit software. The results of this study have significant implications for audit practice, and audit firms should invest in training and education programs to ensure that their auditors are competent and knowledgeable in using audit software effectively. However, it is important to acknowledge that the study's findings rely on the auditors' subjective perceptions, and future research should use more objective measures to assess audit quality. Additionally, further research is needed to examine the impact of audit software on audit quality in other countries and diverse settings.

**Table 5. Descriptive analysis.**

<b>Type of set</b>			
<b>AQF #</b>	<b>Type of statistical measure</b>	<b>ITAP</b>	<b>FA&amp;OP</b>
AQF 1	Mean	4.14	3.9
	Std. deviation	1.46	1.42
	Variance	2.14	2.01
	Valid values	213	217
AQF 2	Mean	3.27	2.91
	Std. deviation	1.66	1.42
	Variance	2.76	2.02
	Valid values	95	105
AQF 3	Mean	4.18	3.89
	Std. deviation	1.40	1.30
	Variance	1.95	1.69
	Valid values	213	217
AQF 4	Mean	4.38	3.98
	Std. deviation	1.18	1.36
	Variance	1.4	1.85
	Valid values	213	217
AQF 5	Mean	4.07	3.91
	Std. deviation	1.53	1.52
	Variance	2.34	2.31
	Valid values	213	217
AQF 6	Mean	3.78	3.9
	Std. deviation	1.37	1.48
	Variance	1.87	2.18
	Valid values	213	217
AQF 7	Mean	3.94	3.78
	Std. deviation	1.46	1.47
	Variance	2.14	2.15
	Valid values	213	217
AQF 8	Mean	3.97	3.58
	Std. deviation	1.58	1.53
	Variance	2.5	2.33
	Valid values	213	217
AQF 9	Mean	4.05	3.92
	Std. deviation	1.45	1.47
	Variance	2.09	2.17
	Valid values	213	217
AQF 10	Mean	4.29	4.05
	Std. deviation	1.23	1.21
	Variance	1.51	1.47
	Valid values	213	217
AQF 11	Mean	3.99	3.81
	Std. deviation	1.50	1.56
	Variance	2.24	2.44
	Valid values	213	217

Table 6. The independent samples t-test.

Independent samples t-test							
95% CI for mean difference							
Type of t-test measure	t-vale	Degrees of freedom (Df)	p-vale	Mean difference	SE difference	Lower	Upper
AQFs	1.662	428	0.097	0.221	0.138	-0.0421	0.502

Note: p-value associated with the t-test is significant at  $p < 0.05$ .

## 6.2. Discussion

The present study aimed to explore auditors' opinions in Saudi Arabia regarding the impact of audit software on audit quality. The findings of this study are consistent with prior research that has examined the role of technology, particularly audit software, in enhancing audit quality. For instance, a study by [Huh, Lee, and Kim \(2021\)](#) investigated the impact of audit software on audit quality in South Korea. The study concluded that audit software improves audit quality by enhancing the accuracy and completeness of audit evidence. Similarly, in our study, the auditors in Saudi Arabia also agreed that audit software enhances the accuracy and completeness of audit evidence, thereby improving audit quality.

Moreover, [Stoel and Havelka \(2021\)](#) examined the effect of advanced IT tools on AQFs, such as audit efficiency and effectiveness. They found that audit software positively impacts AQFs and improves audit quality. Our study's findings are consistent with their findings, as auditors in Saudi Arabia also expressed the belief that audit software enhances audit efficiency and effectiveness, thereby improving audit quality. Furthermore, a study by [Omitogun and Al-Adeem \(2019\)](#) investigated the impact of audit software on audit quality from the perspective of IT auditors. The study found that advanced IT tools positively impact audit quality by enhancing process efficiency.

Similarly, our study's findings are consistent with this study, as the Saudi Arabian auditors believed that audit software enhances audit process efficiency, thereby improving audit quality. Additionally, a study conducted by [Yeghaneh, Zangiabadi, and Firozabadi \(2015\)](#) examined the impact of audit software on AQFs. The study found that audit software positively impacts AQFs, specifically in terms of data gathering process efficiency, thereby improving audit quality. Our study's findings are consistent with this study, as Saudi Arabian auditors believed that audit software enhances data gathering process efficiency, thereby improving audit quality. Finally, a study conducted by [Abu Afifa, Marei, Saleh, and Othman \(2022\)](#) investigated the impact of audit software on audit quality in Canada. The study found that audit software positively impacts audit quality by enhancing the reliability of audit evidence and the efficiency of the audit process. Similarly, our study's findings are consistent with this study, as auditors in Saudi Arabia believed that audit software enhances the reliability of audit evidence and the efficiency of the audit process, thereby improving audit quality.

In summary, the findings of this study are consistent with prior research that has investigated the impact of audit software on audit quality. The study's findings indicated that audit software positively impacts audit quality by enhancing audit evidence reliability, audit process efficiency, audit report quality, and AQFs, such as audit efficiency, effectiveness, and reliability. These findings are consistent with prior research conducted in different contexts, including the USA, South Korea, and Canada, highlighting the importance of advanced technologies, such as audit software, in enhancing audit quality in various countries.

Moreover, the results of our study have significant implications for audit practice in Saudi Arabia. The findings suggest that audit firms in Saudi Arabia should increase their investment in technology, particularly advanced audit software, to enhance audit quality. By demonstrating the positive impact of audit software, audit firms can increase their competitiveness and meet the demands of clients who seek more efficient and effective audit services. As the business environment becomes increasingly complex and dynamic, auditors must keep pace with emerging technologies to deliver high-quality audit services.

The results of this study provide valuable insights into the factors that influence the adoption of technology, particularly audit software, in the audit industry in Saudi Arabia. Furthermore, they highlight the importance of integrating technology into audit processes to improve audit quality.

## 7. Conclusion

In conclusion, this study aimed to investigate the impact of audit software on audit quality in Saudi Arabia and explore auditors' opinions. The study's findings suggest that audit software positively impacts audit quality, and auditor expertise moderates the relationship between audit software usage and audit quality. The study highlights the importance of providing adequate training to auditors to effectively use audit software and underscores the need for audit firms to invest in training and education programs to ensure their auditors are competent and knowledgeable in using it effectively.

While the study provides valuable insights into the impact of audit software on audit quality in Saudi Arabia, it is important to note that the findings are based on the auditors' subjective perceptions. The survey research design and structured questionnaire employed in the study allowed for the collection of

comprehensive data on the factors that affect audit quality, the impact of audit software on audit quality, and the level of awareness and adoption of audit software among auditors. The data collected and analyzed using descriptive statistics provide valuable insights into the factors that affect audit quality and the extent to which audit software enhances or detracts from audit quality. The findings of this study have significant implications for audit practice and guide auditors and audit managers in assessing the resources required for specific assurance engagements and better control and management of the audit process. As technology continues to advance, the importance of audit software in ensuring audit quality will only grow. Therefore, auditors and audit firms must keep up with technological advancements and invest in the necessary training and education to effectively use audit software and enhance audit quality.

Future research in this area could explore the impact of audit software on audit quality in other countries and regions. Additionally, future studies could use more objective measures to assess audit quality and explore the aspects of audit software that significantly impact audit quality. Research could also investigate the impact of audit software on audit efficiency and cost-effectiveness. Finally, further research could explore the role of audit software in enhancing auditor judgment and decision-making, particularly in complex and uncertain audit situations.

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