

-RESEARCH ARTICLE-

THE ROLE OF ELECTRONIC OPERATION OF FINANCIAL AND ACCOUNTING DATA IN ENHANCING THE EFFECTIVENESS OF INTERNAL AUDITING

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—Abstract—

The study aimed to determine the impact of the electronic operation of financial and accounting data on the efficiency of internal auditing. A sample of experienced and specialized auditors from the University of Maysan, the Engineering Technical College in Maysan, and the Technical Institute of Amara participated in the study. The researchers utilized descriptive and inferential statistics to analyze the data collected from 215 survey questionnaires. The study used a cross-sectional research design, a quantitative research methodology, and the Partial Least Square (PLS)- Structural Equation Modelling (SEM) techniques. The PLS-SEM results indicate that the electronic operation of financial and accounting data is significantly and favorably correlated with the internal audit effectiveness of the sampled institutions. Based on these findings, this pioneering study contributed a body of literature to the existing literature that could aid future research by extending this framework. The study also made several recommendations, the most significant of which is that the internal audit of the institutions in question should pay more attention to creating the human and material requirements for the electronic operation of financial and accounting data, as well as providing the appropriate environment for maintaining efficient elements to ensure the integrity of the data.

Keywords: electronic operation of financial and accounting data, the effectiveness of internal auditing.

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1. INTRODUCTION

After the expansion of institutions and the inability of the owners to manage matters directly, it has become necessary for them to delegate some of the powers to others; the importance of internal audit increases in government institutions where a group of employees manages work at different levels (Unegbu et al., 2011). Because the external audit relies heavily on the sampling method, it has become necessary to develop the capabilities of internal auditing and currency programs so that the external auditor can rely on or take them into account. The external auditor's first task is to examine the control and internal audit system to determine the accreditation level (Asiedu et al., 2017). In the case of auditing by audit offices in the private sector, it is also necessary to establish the nature of the processes to be executed or to reject the audit process in its entirety if the effectiveness of the internal control system is not proven (Alqudah et al., 2019; Mu'azu Saidu Badara et al., 2013). Therefore, work must be done to empower the internal auditing bodies by providing learning opportunities for institution employees to enhance their knowledge, develop their skills and capabilities, and utilize flexible structural models, advanced technology, and information and communication systems (Mu'azu Saidu Badara et al., 2013). Information technology is currently a significant challenge to the accounting and control professions, as it demands accountants and observers to be aware of and knowledgeable about these new advancements (Bello et al., 2018). Electronic financial and accounting data operations might affect internal auditing by analyzing internal audit accounting controls using computer-assisted auditing methodologies (Pizzi et al., 2021). Internal auditors must simultaneously monitor IT and manual system components (Unegbu et al., 2011). The auditor can examine the system as a whole and design tests for electronic operations to achieve audit objectives through the incorporation of electronic activities (Soudani, 2013). When awarding audits of electronic activities, each organization or institution must evaluate its information technology capacity vision (Meyyappan et al., 2011), which could lead to improved internal audit effectiveness (Pizzi et al., 2021).

Due to the significance of the subject and the fact that it is one of the significant factors that must be considered to keep pace with the development of information technology and the evolution of modern crime methods, this study focuses on the significance of the electronic operation of financial and accounting data and its role in enhancing the effectiveness of internal auditing (Unegbu et al., 2011). Despite the relevance of electronic operations of financial and accounting data for boosting internal audit effectiveness, which has become a necessity in the current corporate climate in all its facets, it did not receive adequate attention from institution management (Alrabei, 2021). As a result, the departments of these institutions must pay clear and considerable attention to internal audits by adopting electronic operations of financial and accounting data as one of the essential measures for

ensuring good. Applying regulations, instructions, and laws, as well as preserving assets, are combating administrative and financial corruption. Empirically, numerous studies have been conducted on internal audit effectiveness (Abrar, 2020; Mu'azu Saidu Badara et al., 2013; Bello et al., 2018; Unegbu et al., 2011) but have paid little attention to the relationship between electron density and In addition, previous research has primarily focused on developed economies, while developing nations, such as Iraq, have received little attention, particularly in terms of educational institutions (Alqudah et al., 2019; Mu'azu Saidu Badara et al., 2013; Nerantzidis et al., 2022). Consequently, research may be conducted on educational institutions in Iraq. Therefore, this study aims to examine the influence of computerized financial and accounting processes on the effectiveness of internal audits in Iraq.

The general framework of the study comprised an introduction and the theoretical side, which included the electronic operation of financial and accounting data and the efficacy of internal auditing. As for the practical aspect of the research, it hadan analysis of the opinions of a sample of experienced and specialized auditors in the field of accounting and auditing from the University of Maysan, the Technical College of Engineering in Maysan, and the Technical Institute of Amara, and it concluded with the researcher's most significant conclusions and recommendations.

2. LITERATURE REVIEW

The study's literature review has been discussed from theoretical and empirical perspectives, which will be explained in the following sections.

3. THEORETICAL REVIEW

3.1 Effectiveness of Internal Audit

Examinations of risk and control procedures are a vital part of a corporate governance framework. The idea of internal audit effectiveness (IAE) has grown from a method for detecting errors. Fraud and forgeries from both prior and current assessments are covered. An internal audit department is a component of the firm's internal control system (Karagiorgos et al., 2011). It has become crucial for internal audit departments to shift from the traditional methods of performing audit tasks to modern methods, which ultimately lead to the achievement of the institution's goals by adopting a modern methodology based on the following: -(Abed et al., 2022) such as use risk-based auditing in planning and executing internal audits, using modern methods in evaluating internal control systems, analyzing the strengths and weaknesses of the institution's internal control, taking into consideration its management and organizational culture Threats and potential improvement opportunities. It considers the principles of corporate governance, where internal audit works with those charged with governance (such as the board of directors, the

audit committee, and senior management) to ensure the design and implementation of appropriate systems of internal control, and where internal audit can assist in achieving the institution's objectives, enhancing the efficiency and effectiveness of operations, and ensuring compliance with authorities (Alrabei, 2021).

On the other hand, Lutfi et al. (2014) defined the process of auditing electronic data processing systems as the process of collecting and evaluating the evidence to determine whether the use of the computer contributes to achieving the objectives of the audit, whether it is related to expressing an opinion such as protecting the institution's assets and confirming the integrity of the data contained in the financial statements. Josie Plans describes auditing in the electronic operating environments as: - A systematic test of the results or computer architecture, performed by an impartial and qualified individual to provide an opinion on the conformity with generally accepted standards (Salem et al., 2019). And the quality and efficacy of the audit were defined as the level of customer satisfaction attained by meeting their needs, wants, and expectations. Errors and detection of deviations in a manner that leads to meeting the needs of the administration, and because of the inevitable technological development that impacted the internal audit function, it was viewed as an activity to evaluate and assist the administration in determining how to implement the various activities (Fatah et al., 2021).

Consequently, the efficiency of internal audit as the cornerstone for internal audit, Ridley (2008) identifies the three Es of effectiveness, productivity, and economy, with effectiveness being the most important "E." If internal processes are ineffective, efficiency and economy are rendered null and void (Dittenhofer, 2001; Lenz et al., 2015). Researchers examine internal audit effectiveness from a variety of perspectives; however, they all agree that effectiveness is achieved when the specified internal audit desired outcomes are achieved (N. Ahmad et al., 2009; Mu'azu Saidu Badara et al., 2013; Getie Mihret et al., 2007). According to Mu'azu Saidu Badara et al. (2013) research, the capacity to accomplish present IAE objectives appears to be a measure of IAE. However, Dittenhofer (2001) suggests that for these goals to be attained, they must be communicated in clear words. The objective of internal auditing is to bring value and improve an organization's framework, as well as evaluate and improve the performance of risk management, governance, and governance procedures. Despite this, the function of internal auditing inside organizations and between organizations varies greatly (Jadhav, 2017). In addition, the degree of effectiveness varies among various organizational processes (Al-Twaijry et al., 2003). IAE appears to be a complex process that is crucial to the effectiveness of a company's internal management system (Badara et al., 2014). This complex approach entails audit planning, audit engagements, confirming audit results, verifying conclusions to ensure appropriate action, and training staff to ensure they have the requisite skills and expertise to conduct audit engagements. In addition, evaluating the abovementioned factors may not be the

sole way to decide whether IAE successfully achieves its objectives (Dittenhofer, 2001).

In addition, Lenz et al. (2015) focus more on the effectiveness of IAE from the institutional theory perspective. The efficiency of IAE was affected by both significant and small influences. The pressures of coercion, normativity, and imitation represent macro factors. Coercive forces have always been characterized by adherence to laws that impact the function of internal auditing within an institution, normative forces have been characterized primarily by compliance with internal auditing standards, and mimetic forces have been characterized by establishing benchmarks for effective internal auditing in other companies. On the other hand, an organization and its assets, procedures, and relationships help to describe the microelements. Mazza et al. (2018) analyze the effectiveness of IAE within the context of agency theory. According to them, IAE operates as an agent for the board of directors and executive management, and its success depends on serving their interests. This attitude is congruent with the objective of internal auditing, which is to assist the organization in reaching its goals.

In contrast, several studies indicate that IAE is successful for various reasons. For instance, combining internal auditor abilities of IAE work and manager IAE assistance for IAE (Mu'azu Saidu Badara et al., 2013), adhering to internal auditing guidelines (Cohen et al., 2010), and assessing the effectiveness of IAE techniques (Mu'azu Saidu Badara et al., 2013). Even though the IAE provides advice on improving the organization's operations, some studies examine the frequency with which these proposals are implemented to determine the IAE's effectiveness (Arena et al., 2009; Joshi, 2020). Numerous studies also investigate the supply and demand sides of the effectiveness of IAE. The supply approach is based on how satisfied auditors were with IAE, while the demanding view is based on how satisfied management and audits were with IAE (Alzeban et al., 2014; Cohen et al., 2010; Erasmus et al., 2018). Alzeban et al. (2014) analyze the effectiveness of internal auditing from both auditee and auditor viewpoints. They evaluate the effectiveness of IAE based on its capacity to plan, raise organizational productivity, evaluate, and improve internal control and risk management, and implement IAE recommendations. Also, Vardar et al. (2021) stated that "IAE is one of the most important factors for internal auditors to consider if they wish to implement good governance in their functions and organizations." Therefore, the IAE functions and its organizations need to understand the factors discussed in the following section that affect the IAE's efficiency.

3.2 Electronic Operations of Financial and Accounting Data

The electronic operating system is a collection of electronic devices and programs used to store data, convert it into information, and store this information until it is used to make administrative decisions and carry out tasks. In other words, it is a

comprehensive system for a set of principles and methods that link human effort and electronic devices to operate inputs from quantitative and descriptive data obtained from within and outside of institutions and to provide users with useful information for monitoring, evaluating performance, applying auditing standards, and making decisions. In addition to these definitions, there are numerous advantages, including It increases the speed and accuracy of electronic computers, thereby decreasing the required time. To execute many arithmetic operations with high precision, with external rather than internal errors constituting most errors. In other words, modern computers have a large storage capacity because they can store and quickly retrieve millions of files.

In contrast, modern computers are expandable in that additional devices or memory can be added. These characteristics indicate that electronic devices are vital to organizations; if these devices fail, several problems may arise. For instance, (Yousif, 2022) notes that one of the flaws in the electronic operation of financial and accounting data is that it may reduce the efficacy of internal auditing. In addition, according to Bezdek (2022), the increasing complexity of electronic operating systems impedes the development of efficient and effective control systems to detect fraud and violations. This is why (Aikins, 2011) stated that electronic operations of financial and accounting data were essential for enhancing the efficacy of internal auditing. The same argument was made by Meyyappan et al. (2011), who asserted that electronic operations of financial and accounting data played a significant role in reducing fraud in organizations; this may aid in enhancing the effectiveness of internal auditing.

3.3 Empirical Review and Hypothesis Development

Certain employees may be able to alter data from numerous other websites without being detected so that auditors may rely heavily on the features and specifications of a computer. This demonstrates how the electronic processing of financial and accounting data affects the efficiency of internal auditing. In practice, these traits appear as follows: Consistent and consistent effort, according to Alsahn et al. (2017) 1) Separate documentation. Thirdly, simultaneous, and immediate account and data updates Banks seek monetary and fiscal stability in their systems through various approaches, such as a dedication to implementing technology standards following both global norms and local regulatory authorities' criteria. Yang et al. (2004) discussed how the rapid development of technology had altered auditing, resulting in electronic operations of financial and accounting data (EOFAD) auditing and standards and principles for internal control. EOFAD has altered firms' business practices, making them more efficient and assisting them in making better judgments. The authors describe in depth what auditing standards and suggestions are available in the United States and how these guidelines and regulations can assist auditors in IT auditing. However, the authors have not specified what IT auditing programs are employed or how they directly impact

auditing. The writers also failed to demonstrate the significance of technology to an auditor's functions and responsibilities.

Thottoli (2021) investigated the prevalence of corporate reporting on the Internet and its implications for auditing. Due to the fast growth of the Internet, electronic, web-based Internet reporting will eventually become widespread. The author initially reviewed a large amount of material and accounting standards to determine the best practices and ethical approach for internet business reporting. According to additional research, the financial sector enhances information quality and ensures that customers accept it. The author advised implementing specific auditing procedures, such as those outlined in auditing standards, by applying the suitable electronic operation to financial and accounting data (Brown, 2006; Meyyappan et al., 2011). The author also suggested numerous security methods. Providing verified evidence on an auditor's website, for example, improves control, reduces audit risks, and makes information even more accurate and trustworthy to consumers. But the author has only superficially discussed and examined the ramifications of the auditing profession. She has not yet determined the true impact of online corporate reporting on auditors (Brown, 2006; Meyyappan et al., 2011).

Goodwin (2004) has investigated how firms in the private and public sectors conduct internal audits. Several factors have been thoroughly examined, including the organization's standing, the use of internal audit as a "tour of duty," outsourcing the audit function, risk management, and collaboration with external auditors. The research is based on a survey by New Zealand and Australian organizations. The amount of time participants spent on internal audit procedures was assessed using a survey. Internal auditing tends to be more critical in governmental enterprises than private ones. A survey revealed that both the public and commercial sectors outsourced specific internal auditing jobs, particularly those requiring electronic operations of financial and accounting data and systems. Both industries outsource almost equivalent amounts of labor. The author also discussed the essential components of internal audit, such as "finance audits and internal controls, risk management operations, and system audits." From the perspective of the chief internal auditor, the author examines the relationship between external auditors and internal audits. The data reveals little substantial differences between the government and private sector responses. Additionally, internal audit reports are readily accessible to external auditors in both businesses. This could be because the market for audits in the private sector is more competitive than in the public sector. Although internal audit roles vary between government and industry, the author concluded that contacts with independent auditors and internal audit activities appear to be the same. The authors contrasted the activities and characteristics of internal auditing from a structural standpoint but did not elaborate on how internal audit procedures work within an organization.

Jayalakshmy et al. (2005) identified problems and pressures auditors will face during globalization to retain trust and honesty. The authors went through numerous articles and journals on audit fraud, the definition of "true and fair perspective," the independence of auditors, and the function of internal auditors. Numerous authors, including William et al. (1999), have addressed the responsibilities and function of internal auditors in recognizing and preventing fraud. Roufaiel et al. (1994) noted that computer fraud is simple but extremely difficult to detect; hence, auditors should clarify their role in avoiding it. The writers have discussed how the auditing profession lacks independence, integrity, and credibility concerning its responsibility to detect and remove audit fraud. In addition, they explored how accounting complexity and changing standards have affected auditors' ability to provide an accurate and fair view (TFV) judgment. "True and fair vision (TFV) concept." (TFV) is a concept that is recognizable to both accountants and auditors. It has been the central principle of audited accounting for a very long time. Current audit failures show that the idea of TFV and whether auditors certify this concept must be modified to strengthen the audit method. This must be backed by examining the opinions of the company's shareholders and auditors. The writers have done an excellent job of bringing to the attention of auditors, businesses, and the public the need for a change in the current auditing process. People believe that internal auditors, who work with management, are more effective than external auditors at identifying and detecting fraud. This implies that internal auditors must possess the same independence, honesty, and professionalism levels as independent auditors. Therefore, according to the researchers, it is essential to consider whether changing the way we think about TFV will assist auditors in honestly performing their duties. Because the writers could not present sufficient fieldwork and statistical proof for this type of research, the idea is based mainly on secondary sources. The authors have also failed to clarify the duties of every auditor and the measures they take to detect and prevent audit fraud. No research was conducted to determine its applicability in the actual world.

Jackson (2004) examined auditors' usage of audit tools and software and the impact of technology evaluation on their job. When discussing audit software issues in the United States, the author cited the Internal Auditor's tenth annual software survey as an illustration. The author stated that an issue with installing audit software was that it was costly, did not satisfy the audit department's needs, and was challenging to educate auditors. The author utilized the essential notes provided by multiple audit-related software professionals who appeared to have varying degrees of expertise in installing and maintaining the software at this location and inside the firm. One of them is Lanza (2004), an audit manager and the founder of AuditSoftware.net. He has contributed many years of expertise in the sector by recommending many methods for ensuring that audit software is utilized effectively within an organization. According to Richard Lanza, audit systems are often simple to implement but difficult to manage. This can be achieved through interactive training and regular monitoring of the learning experience. According to Rollins et al. (2005) and Hazaea et al. (2021), the firm sponsor

(management) may be resistant to training if they fear it will reduce their productivity. The author also provided extensive details regarding the organization's software, including its popularity, dependability, and overall customer satisfaction. Numerous audit-related software products are available for subscription and use within a company. However, when this program failed to meet the auditors' requirements, it caused various reliability and consistency issues. The author also discussed the availability of open-source software on the Internet. Utilizing open-source software has several practical benefits. Auditors desiring highly customized software may wish to design their instruments rather than rely on existing approaches' capabilities. When devising methods for detecting fraud, researchers also analyzed trends. The article does not elaborate on how technology developments and the availability of advanced audit tools could make audits more efficient and productive (Jarrah et al., 2022).

Rupšys et al. (2005) attempted to determine what internal auditing is and how it functions. In addition, they investigated the consequences of using computers to manage financial and accounting data and the advantages of internal audits in the administration of an organization. The author has studied the origins of internal auditing and its proper definition by reading literature, comparing, and reviewing the most recent research. Over the past few decades, internal audit has been defined and redefined numerous times, yet we still struggle to comprehend what it accomplishes and how it fits into an organization. Currently, internal auditing includes not only the effectiveness of internal controls, fraud investigations, and assistance for external auditors but also the identification of organizational risks and consultations with senior management regarding risk management, process improvement, and global operations (Al-Hiyari et al., 2019). Everyone within a business must comprehend what internal auditing entails. Brauweiler (2017) concurs with the author that it is essential to understand what internal and external decision-makers desire and want from the internal auditing component. According to the findings of a study, there are several issues with internal audit independence, despite its importance to a company (Al-Hiyari et al., 2019). In examining what IT signifies, the author has highlighted some of the most significant IT benefits in auditing. Applications based on IT aid auditors. "Computer-Assisted Audit Tools" (CAATs) make internal auditing in an organization more successful (Dias et al., 2018). However, IT developments such as mechanization and digitalization increased the risk of firms discontinuing operations, losing data, experiencing network failures, and modifying how they monitor and govern their operations. According to the author, the function of an internal audit is to monitor, evaluate, and improve risk management, controls, and governance procedure. Regrettably, experts have not undertaken sufficient research on how different approaches to corporate governance may affect the effectiveness of an organization's internal audit procedures. Comparing how people interpret feature and application-level usages, Kim et al. (2009) discovered that people perceive a software program as a collection of features. Li et al. (2018) say that technology features have a significant effect on how thriving technology is accepted in the field of internal auditing

because they affect how people use systems, how useful they think they are, and how easy they think they are to use. Another study discovered the favourable and considerable impact of electronic operations on the efficiency of internal auditing (Jarrah et al., 2022). Previous debate serves as the basis for the study hypothesis presented here.

H1: Electronic operations of financial and accounting data has a positive and significant effect on the effectiveness of internal auditing.

4. RESEARCH METHODOLOGY

The existing literature employs qualitative and quantitative methods (Eulerich et al., 2020). Numerous authors have stated that the quantitative research approach is the most appropriate when the data acquired through the research questionnaire are based on a previous study (Bloomfield et al., 2019). Auditors with experience and expertise in accounting and auditing distributed the questionnaire to the study sample at the University of Maysan, the Technical College of Engineering in Maysan, and the National Technical Institute of Amara for data collection. These higher education institutions in the city of Al-Amarah were selected as a research community due to the clear and vital role of these prestigious educational institutions in Maysan governorate in economic, social, and cultural development, especially at this stage, which requires giving educational institutions a more precise role through administrations and researchers to play its critical role in the development process, find new alternatives for resources. The research sample comprised specialists and experts from these educational institutions because their roles in these institutions are dominated by innovation and dealing with a changing environment and ambiguous situations, indicating that they are more concerned than others about internal control and combating administrative and financial corruption. The questionnaire consisted of two sections: the first contained personal information on the study sample, and the second had a series of questions about the research variables. There were two primary variables: electronic operation variables of the financial and accounting data, which were tested by 12 items, and the efficiency of internal auditing, which was measured by 8 things. After adapting it to the study's variables, the questionnaire was presented to a group of specialized professors. The necessary modifications were made based on their scientific observations regarding the form and clarity of their paragraphs for the sample in question. The form was subjected to stability tests, with encouraging results regarding the questionnaire's use. Using an individual unit of analysis, questionnaires were issued to experienced and specialized auditors in the field of accounting and auditing at these institutes. Three educational institutions issued 250 questionnaires to skilled and trained auditors in accounting and auditing. 215 research questionnaires were received, representing an almost 86 percent response rate. Five-point Likert scale was used to evaluate the research questionnaires.

4.1 Data Analysis and Results

Techniques for measuring and analyzing the researcher has used a set of statistical procedures to analyze the data statistically, obtain precise indicators that fulfill the aims of the study, and evaluate the validity of the main hypothesis: To determine the effect of electronic operation variables of financial and accounting data on the efficacy of internal auditing, two primary statistical analyses, namely descriptive and inferential statistics, were done.

4.2 Descriptive Results

The outcomes of demographic statistics are presented in [Table1](#). The results of [Table1](#) suggests that 165 of the 215 respondents are male and 50 are female. The primary reason for increasing the ratio of males to females is that Iraq is not apredominantly female society; consequently, most respondents in educational institutions are male. Most responders have an average age between 31 and 40, indicating that they are youthful and have expertise with the newest technologies. In the qualifications area, most responders hold a master's degree. In terms of teaching experience, most responders had between 11 and 20 years of experience. The projected outcomes are displayed in [Table1](#) below.

Table1.Demographic Profile

Gender	Total	Percentage
Male	165	76.74%
Female	50	23.26%
Age		
20-30	43	20%
31-40	96	44.65%
41-50	65	30%
Above 50	11	5.35%
Qualification		
Technical Education	87	40.46%
Masters	102	47.44%
PHD	26	12.10%
Experience		
Less than 11 years old	41	19%
11-20 years	95	44%
21-30 years	68	32%
More than 30 years	11	5%

4.3 Descriptive Statistics

The results of [Table2's](#) anticipated values are the items' average means, standard deviations, weighted percentage, and rank. The average means for the items (7), (4), (6), (2),(1), (8), (9), (10), (3), (12),(5),(11) are (4.41), (4.38), (4.24), (4.15), (4.09), (4.03), (3.91), (3.88), (3.74), (3.44) (3.32). These variables show a significantly positive trend and are the most influential in determining the amount of electronic operation of financial and accounting data in the institutions that comprised the research sample. Financial and accounting data processing at the research sample institutes. Second, all the standard deviation values for the twelve items of the electronic operation variables for the financial and accounting data are less than one true, except item 5, for which the standard deviation was slightly greater than one true; this indicates the homogeneity of the sample members' responses and their convergence around each electronic operation variable item. The financial and accounting data permits a great degree of confidence in the correctness of the conclusions of the previous study, which corresponds to the average trend indicators. The expected values are shown in [Table2](#) below.

In addition, [Table3's](#) results for anticipated values provide the components' average means, standard deviations, weighted percentages, and ranking. These things are (18), (13), (19), (15), (17), and (20). (14). (12). The recorded averages trend is as follows: (4.21), (4.15), (4.06),(4.03), (4.03),(4),(3.94),(3.41); these variables reflect a strong positive trend and are the most influential of the eight factors in determining the level of internal auditing effectiveness in the same research institutions. Second,all the standard deviation values for the eight paragraphs comprise the internal audit effectiveness variables. It is less than one correct, which indicates the homogeneity of the sample members' responses and their convergence around each paragraph of the variables for the effectiveness of the internal audit, allowing a significant degree of confidence in the accuracy of the results of the previous analysis, which is associated with the average trend indicator. The expected values are shown in [Table3](#) below.

4.4 Inferential Results

The data were analyzed using version 3.28 of Smart PLS. The intelligent PLS utilized Partial Least Square-Structural Equation Modelling (PLS-SEM). In the measurement model, both the convergent and discriminant validity of the construct were tested. The convergent validity was measured using factor loadings with a recommended value of 0.5, Cronbach alpha with a recommended value of 0.7, composite reliability with a recommended value of 0.7, and extracted average variance with a recommended value of 0.5. These are recommendations made by the following researchers: ([R. Ahmad et al., 2019](#); [F. Hair Jr et al., 2014](#); [Hair et al., 2012](#); [Hussain et al., 2018](#)).

Table 2. Electronic Operation Variables of the Financial and Accounting Data

	Items	Average Direction	Standard Deviation	Weighted Percentile	Ranking
1	The electronic operation of financial and accounting data contributes to the quality of internal auditing, especially in reducing administrative and financial corruption	4.09	0.621	81.765	5
2	The electronic operation of financial and accounting data helps to increase the satisfaction and confidence of all relevant parties, especially when an effective internal audit is available	4.15	0.610	82.941	4
3	The effectiveness of internal auditing considering the electronic operation of financial and accounting data is affected by full disclosure	3.82	0.834	76.471	9
4	The electronic operation of the financial and accounting data provides the reports required by the supervisory and administrative authorities in the shortest possible time	4.38	0.604	87.647	2
5	The internal auditor in our organization has the appropriate environment to use the electronic operation of financial and accounting data	3.44	1.106	68.824	11
6	The electronic operation of the financial and accounting data differs from the manual audit because it saves the effort and time required for the audit process	4.24	0.819	84.706	3
7	The electronic operation of financial and accounting data requires the use of external expertise for training on how to implement internal auditing	4.41	0.557	88.235	1
8	The electronic operation of financial and accounting data helps internal auditing by achieving accuracy and objectivity when dealing with such data	4.03	0.717	80.588	6
9	The electronic operation of the financial and accounting data helps to give sufficient space for the auditors to examine the documents and documents supporting the financial transactions	3.91	0.712	78.235	7
10	The electronic operation of the financial and accounting data helps the internal auditor fully achieve the internal audit's objectives	3.88	0.808	77.647	8
11	The reason for the weakness of internal audit procedures is often attributed to the failure to follow the electronic operating system for data and accounting	3.32	0.945	66.471	12
12	The internal auditor prefers manual auditing over electronic auditing because it is less complex	3.74	0.963	74.706	10

Table3. Internal Audit Effectiveness Variables

	Items	Average Direction	Standard Deviation	Weighted Percentile	Ranking
13	Considering the electronic operation of financial and accounting data, the possibility of rapid retrieval of information is available, which is positively reflected on the effectiveness of internal auditing	4.15	0.702	82.941	2
14	The economic units have the necessary professional competence among employees working in the field of electronic operation of financial and accounting data and the preparation of financial statements, which helps in reducing mistakes and facilitates the work of internal auditing.	3.41	0.857	68.235	8
15	The electronic operation of financial and accounting data facilitates the procedures for preparing financial statements, which enhances the effectiveness of internal auditing	4.03	0.717	80.588	4
16	Electronic data and accounting operation makes it easier for auditors and other parties to track financial transactions from their inception to their completion.	4.00	0.778	80	6
17	Electronic risks and problems limit the effectiveness of the electronic operation of financial and accounting data, which negatively affects the effectiveness of internal audit	4.03	0.717	80.588	5
18	The electronic operation of financial and accounting data helps to quickly obtain accounting information on demand, which saves time and effort for the internal auditor	4.21	0.770	84.118	1
19	The processing of financial and accounting data considering electronic operation is characterized by a high degree of accuracy, which helps in the ease of detecting and handling errors	4.06	0.814	81.176	3
20	The electronic operation of financial and accounting data helps to quickly discover cases of non-compliance with the principles and standards of accounting and auditing, local and international .	3.94	0.851	78.824	7

All the numbers in [Table 1](#) are bigger than the previously discussed values, demonstrating that the construct meets the criteria for convergent validity. On the other hand, the discriminant validity was assessed using three criteria: Fornell Larker, which indicates that above diagonal values should be greater than below values. Cross loadings that should equal factor loadings and Hetrotrait Monotrait Correlation (HTMT) indicate that the correlation between the constructs should be less than 0.85 or 0.90 ([Henseler et al., 2015](#)). Because Fornell & Larker diagonal values are more than below values and HTMT values are less than 0.85, [Tables4](#) and [5](#) indicate that the construct meets the criterion for discriminant values.

Table4.Reliability and Validity

Construct	Item	Loadings	Cronbach's Alpha	CR	AVE
Electronic operation of the financial and accounting data	EOFAD1	0.721	0.761	0.799	0.504
	EOFAD2	0.825			
	EOFAD3	0.72			
	EOFAD4	0.544			
	EOFAD5	0.597			
	EOFAD6	0.813			
	EOFAD7	0.719			
	EOFAD8	0.739			
	EOFAD9	0.825			
	EOFAD10	0.687			
	EOFAD11	0.794			
	EOFAD12	0.916			
	EOFAD17	0.783			
Internal audit effectiveness	IAE1	0.894	0.802	0.833	0.625
	IAE2	0.784			
	IAE3	0.802			
	IAE4	0.756			
	IAE5	0.812			
	IAE6	0.675			
	IAE7	0.856			
	IAE8	0.789			

Note: IAE-internal audit effectiveness, EOFAD-electronic operations for financial and accounting data

Table5.Discriminant Validity

	EOFAD	IAE
EOFAD	0.710	
IAE	0.568	0.790

Note: IAE-internal audit effectiveness, EOFAD-electronic operations for financial and accounting data

4.5 Structural Model

Using bootstrap 5000 resampling techniques, the hypothesis was tested to run the multiple regression. The multiple regression analysis of the independent variable on the dependent variable showed that the value of the coefficient of determination (R^2) amounted to (42%), which means that the independent variable is explained and shared by (42%) in determining the level of effectiveness of the internal audit. The PLS-SEM findings further show that the electronic operation of the financial and accounting data (EOFAD) positively and significantly affects the internal audit effectiveness (IAE) that supports the proposed hypothesis. These results show that when the EOFAD has improved, the capability of the IAE also increased. This indicates that according to teachers' perceptions in Iraq, the EOFAD is a vital indicator to enhance the ability of the IAE. This is further supported by previous studies, which suggested that when the EOFAD has increased, the capability of the IAE is also increased (Al-Refaee et al., 2013). The above-discussed results are predicted in the following Table 6 below.

Table6.Hypothesis Results

	Original Sample	Sample Mean	Standard Deviation	T Statistic	P Values	Decision
EOFAD -> IAE	0.876	0.879	0.014	61.832	0	Supported

Note IAE-internal audit effectiveness, EOFAD-electronic operations for financial and accounting data.

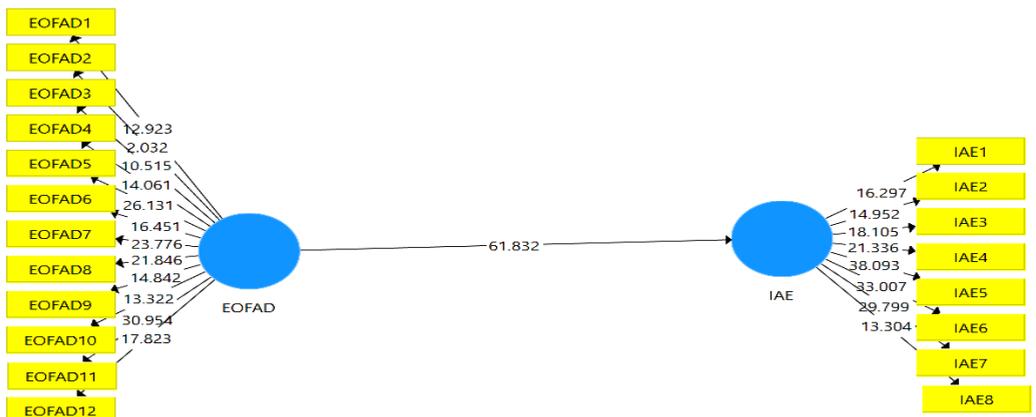


Figure1. Path Analysis

5. DISCUSSION AND RECOMMENDATIONS

The internal audit ensures that a company's risk management, governance, and internal control systems operate effectively from an external perspective (Soh et al., 2011). The internal audit function of internal control, risk management, and governance are believed to impact a company's financial performance (Tumwebaze et al., 2022). In terms of budgeting performance and financial accountability, these elements can be beneficial and detrimental to a company's financial performance. If the internal audit is not conducted effectively, many frauds could occur within the firm, which could harm its performance (Tumwebaze et al., 2022). Therefore, information technology (electronic operations) can have an impact on the internal audit by analyzing and evaluating internal audit accounting controls and searching for ways to apply computer-assisted auditing techniques (CAAT- Computer Audit Assist Technique) (Baatwah et al., 2021). The internal auditor must simultaneously monitor both electronic and manual system components. When electronic operations and manual control are merged, the auditor can evaluate IT and manual controls to ensure that the internal audit is functioning properly. Therefore, each organization must consider its IT capacity vision when determining which organization has the best internal auditing.

Consequently, the purpose of the present study was to examine the influence of electronic operations of financial and accounting data on the efficiency of internal auditing. Data was acquired from Iraqi educational institutions for this purpose. The statistical analysis revealed that the electronic operation of financial and accounting data had a positive and ethical association with the level of internal auditing effectiveness in the institutions comprising the research sample. This demonstrates that respondents are aware that electronic operations of financial and accounting data can improve internal audit efficiency. This indicates that the electronic operation of financial and accounting data, in general, obviously contributes to the interpretation of the level of effectiveness of internal audit in the Institutions that are the focus of the research, supporting the validity of the research's central hypothesis. These findings are also consistent with the study of (Abdulai et al., 2021; Al-Refae et al., 2013; Alrabei, 2021; Unegbu et al., 2011) since they suggested that electronic operations have a beneficial impact on internal audit. Based on these data, one can also conclude that deploying specific software tools can significantly boost the efficiency of the job performed by internal auditors, substantially contributing to an increase in the internal audit's efficiency and effectiveness. In the future, paperless audits will undoubtedly become the standard as more audit clients adopt paperless systems. Auditors will be able to complete most of their work online thanks to the development of new auditing software. Auditors will be obliged to collect evidence digitally and use online auditing software as their primary auditing tool shortly.

6. IMPLICATIONS AND RECOMMENDATIONS

There are both practical and theoretical ramifications of the research. Theoretically, past research on the efficacy of internal auditing has primarily concentrated on other exogenous variables. In contrast, the impact of electronic operations of financial and accounting data on the effectiveness of internal auditing in Iraqi organizations has received less attention. Therefore, the current study contributed to a body of literature in the context of Iraqi educational institutions on the relationship between electronic operations of financial and accounting data and the effectiveness of internal auditing, which is considered a pioneering study that could aid future researchers and academics. The practical significance of the research stems from the importance of internal auditing for all institutions, particularly educational institutions, where the service sector is distinguished from other economic activities by its diversity, multiplicity, and provision of services to all citizens. This activity is characterized by continuous change and development, whether at the level of internal work mechanisms or the level of the surrounding environment, which gives oversight and internal audit the most crucial role in this change and development in various fields, particularly in the field of fighting administrative and financial corruption. The research could also aid policymakers and regulatory bodies primarily concerned with the audit department in understanding the electronic operations for financial and accounting data to increase the effectiveness of internal auditing, thereby reducing fraud, and possibly boosting the performance of organizations.

In addition to implications, the research also includes the following essential recommendations that emerged from the study:

1. Since most of the sample members in question had extensive work experience and primary and advanced university degrees, attention must be paid to them, as they represent human capital, which is equally significant and essential to the achievement of Institutions' end goals regarding the material capital and not wasting them, as well as spending on them in the field of education and training, and providing material and moral incentives from to achieve the best investment of these resources and improve their standard of living to prevent them from being dragged behind cheap methods for illegal interests.
2. The need for external knowledge or specialized agencies to utilize the electronic operation of financial and accounting information.
3. The importance of providing the proper environment for the electronic operation of financial and accounting data through the development of human requirements and the necessary material.
4. Departments should reduce the risks associated with employee turnover by fostering an environment conducive to retaining efficient cadres. To guarantee the implementation of audits on financial aspects in line with instructions and to

prevent new workers from making errors that waste public funds and harm the institution's reputation.

5. The need to develop the skills of workers in accounting and auditing devices on modern methods of electronic data Operations Financial and accounting, and to engage them in the necessary development courses, as well as to develop the skills of all employees so that they can take the steps needed to improve the efficiency of internal auditing and thus achieve the goals of the institution.

7. RESEARCH LIMITATIONS AND FUTURE DIRECTIONS

Due to the limited scope of the study, which could explore new research areas, the research is limited. The research was limited to educational institutions with a distinct working environment than other manufacturing enterprises, limiting the study's generalizability. To strengthen the generalizability of this study, further research could be conducted on additional manufacturing sectors in the future. In addition, the research was limited to Iraq, a developing nation; consequently, future research might be conducted in other industrialized countries to strengthen the generalizability of the findings. The sample size was tiny, which may not have accurately reflected the results; consequently, future research might be conducted by expanding the sample size to determine whether the findings have changed.

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Appendix

Section (A)

In the name of Allah the Merciful

The virtuous professor,

M/questionnaire

I give you my best regards.....

I put before your honourable person a questionnaire specialized in the subject of the tagged research (the role of electronic operation of financial and accounting data in enhancing the effectiveness of internal auditing).

We kindly request you to read its paragraphs accurately and objectively and answer them in a manner consistent with your opinions and orientations.

1. Please answer all paragraphs of the questionnaire by placing (/) in front of the paragraphs that express your opinion, noting that the paragraphs include five options are (totally agree, agree, neutral, disagree, do not agree at all).
2. The questionnaire data is used for research purposes and is not being used for any other purposes.
3. There is no need to mention the name or address at all.

Please accept my sincere thanks and appreciation

Researcher Terminology

Electronic operation of financial and accounting data: It represents the use of an electronic system (program) that processes the input of financial data and accounting by classifying, summarizing, recording, and then reporting on it in the form of accounting outputs that can be used them in the various decision-making process.

Internal audit: It is an independent evaluation, objective and advisory activity designed to increase the value of an economic unit improving its operations and helping it achieve its goals by creating an organized approach to assess and improve its effectiveness Risk management, control and governance processes.

(Section B)

Directions: Please fill in the space with a tick (/) next to the question the answers that are most applicable to you.

Gender
<input type="checkbox"/> Male <input type="checkbox"/> Female
Age
<input type="checkbox"/> 20 to 30 years <input type="checkbox"/> 31-40 years
<input type="checkbox"/> 41-50 years <input type="checkbox"/> Above 50 years
Working Experience
<input type="checkbox"/> less than 11 Years <input type="checkbox"/> 11 to 20 Years
<input type="checkbox"/> 21 to 30 years <input type="checkbox"/> Above 30 years
Qualification
<input type="checkbox"/> Technical Education <input type="checkbox"/> Masters
<input type="checkbox"/> Phd _____

Section (C)

Please indicate to what extent you agree to the following statements regarding enterprise risk management in your organization. Please indicate your choice by circling the number in the scale given:

Items	Paragraph content	Totally agree	I agree	neutral	I do not agree	I don't agree at all
	The first: the electronic operation of financial data and accounting					
1	The electronic operation of financial and accounting data contributes to the quality of internal auditing, especially in reducing administrative and financial corruption					
2	The electronic operation of financial and accounting data helps to increase the satisfaction and confidence of all relevant parties, especially when an effective internal audit is available					
3	.The effectiveness of internal auditing in light of the electronic operation of financial and accounting data is affected by full disclosure					
4	The electronic operation of the financial and accounting data provides the reports required by the supervisory and administrative authorities in the shortest possible .time					
5	The internal auditor in our organization has the appropriate environment to use the electronic operation of financial and accounting data					
6	The electronic operation of the financial and accounting data differs from the manual audit because it saves the effort and time required for the audit process					
7	The electronic operation of financial and accounting data requires the use of external expertise for training on how to implement internal auditing					
8	The electronic operation of financial and accounting data helps internal auditing by achieving accuracy and objectivity when dealing with such data					
9	The electronic operation of the financial and accounting data helps to give sufficient space for the auditors to examine the documents and documents supporting the .financial transactions					
10	.The electronic operation of the financial and accounting data helps the internal auditor to achieve the objectives of the internal audit to the fullest extent					
11	The reason for the weakness of internal audit procedures is often attributed to the failure to follow the electronic operating system for data and accounting					
12	The internal auditor prefers manual auditing over electronic auditing because it is less complex					
	The second axis: the effectiveness of internal audit					
13	In light of the electronic operation of financial and accounting data, the possibility of rapid retrieval of information is available, which is positively reflected on the effectiveness of internal auditing					
14	The economic units have the necessary professional competence among employees working in the field of electronic operation of financial and accounting data and the .preparation of financial statements, which helps in reducing mistakes and facilitates the work of internal auditing					
15	The electronic operation of financial and accounting data facilitates the procedures for preparing financial statements, which enhances the effectiveness of internal auditing					
16	The electronic operation of financial and accounting data facilitates the procedures for preparing financial statements, which enhances the effectiveness of internal auditing					
17	Electronic risks and problems limit the effectiveness of the electronic operation of financial and accounting data, which negatively affects the effectiveness of internal audit					
18	The electronic operation of financial and accounting data helps to quickly obtain accounting information on demand, which saves time and effort for the internal auditor					
19	The processing of financial and accounting data in light of electronic operation is characterized by a high degree of accuracy, which helps in the ease of detecting and handling errors					
20	The electronic operation of financial and accounting data helps to quickly discover cases of non-compliance with the principles and standards of accounting and .auditing, local and international					