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The Role of Internal Audit in Reducing the Risks of Electronic Accounting Information Systems An Applied Study On Companies Listed in The Saudi Stock Market

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Abstract

This study seeks to explore the factors associated with the role of the internal auditor in Saudi companies and its ability to reduce the risks resulting from the use of electronic accounting information systems. Specifically, the researcher seeks to know whether (the professional competency of the auditor, the independence of the auditor, the diversity of the specializations of the auditing department, the support of senior management, the auditor's knowledge of the nature of work) has a role in reducing the risks associated with the use of electronic accounting information systems. To achieve this goal, the researcher prepared a questionnaire and distributed it to the study population, which consists of all internal auditors and employees of companies listed in the Saudi stock market. Where, the number of distributed questionnaires was 142 and 93 of them were retrieved, valid for statistical analysis. After using the appropriate statistical methods to test the hypotheses of the study, the researcher reached several results, the most important of which are: the professional competence of the internal auditor, the complete independence enjoyed by the internal auditor, the diversity of specializations of the internal audit department, the support of senior management, also the internal auditor's knowledge of the nature of the work of electronic accounting information systems All of them help support the role of the internal auditor in reducing the risks associated with electronic accounting information systems. We also noticed that the sample members enjoy a good degree of independence, but they need to develop their scientific qualifications, work on continuous training, and acquire professional certificates that are commensurate with the environment of electronic accounting information systems.

Keywords: *Internal audit, risk management, Saudi companies, IT audit*

دور المراجعة الداخلية في تخفيض مخاطر نظم المعلومات المحاسبية الإلكترونية
دراسة تطبيقية على الشركات المدرجة في سوق المال السعودي

الملخص

تسعى هذه الدراسة الى استكشاف العوامل المرتبطة بدور المراجع الداخلي في الشركات السعودية وقدرته على تقليل المخاطر الناتجة من استخدام نظم المعلومات المحاسبية الالكترونية. وعلى وجه التحديد تسعى الباحثة الى معرفة ما اذا كان لكل من (الكفاءة المهنية للمراجع الداخلي، استقلالية المراجع الداخلي، تنوع تخصصات قسم المراجعة الداخلية، دعم الادارة العليا، معرفة المراجع الداخلي بطبيعة عمل نظم المعلومات المحاسبية الالكترونية) دور في تقليل المخاطر المصاحبة لاستخدام نظم المعلومات المحاسبية الالكترونية. ولتحقيق هذا الهدف قامت الباحثة بإعداد استبيان وتوزيعه على مجتمع الدراسة والذي يتكون من جميع المراجعين الداخليين والعاملين في الشركات المدرجة في سوق المال السعودي. حيث كان عدد الاستبانات الموزعة 142 استبيان وتم استرجاع 93 منها صالحة للتحليل الاحصائي. وبعد استخدام الأساليب الإحصائية المناسبة لاختبار فرضيات الدراسة توصلت الباحثة الى عدة نتائج من أهمها: ان الكفاءة المهنية التي يمتلكها المراجع الداخلي، الاستقلالية التامة التي يتمتع بها المراجع الداخلي، تنوع تخصصات قسم المراجعة الداخلية، دعم الادارة العليا، أيضا معرفة المراجع الداخلي بطبيعة عمل نظم المعلومات المحاسبية الالكترونية جميعها تساعد في دعم دور المراجع الداخلي في تخفيض المخاطر المصاحبة لنظم المعلومات المحاسبية الالكترونية. أيضا لاحظنا ان افراد العينة يتمتعون بقدر جيد من الاستقلالية ولكنهم بحاجة الى تطوير تأهيلهم العلمي والعمل على التدريب المستمر واكتساب الشهادات المهنية والتي تتناسب مع بيئة نظم المعلومات المحاسبية الالكترونية.

الكلمات المفتاحية: المراجعة الداخلية، إدارة المخاطر، الشركات السعودية، تدقيق نظم المعلومات المحاسبية الإلكترونية

1 Introduction

Information technology currently plays a major role in the business environment as it helps to:

i. Create new job opportunities.

ii. Support the economy and raise the GDP. (Kvochko, 2013)

iii. It also raises the efficiency and effectiveness of information systems, especially accounting information systems as it helps companies to generate highly credible information that serves the relevant parties through the use of computers and appropriate operating software in addition to reducing the time, effort and cost that go in to it which in turn improves the operational efficiency of the company. (Azriel, 2015)

Also it creates a competitive and challenging atmosphere between companies, it is noted in the proposed research that all the companies were racing to introduce modern technology and invest in it and train their employees to use the modern technology, and all the companies were keen to serve their customers effectively and at an appropriate speed and this is what is explicit in the observation of research, at the present time, from some of them providing their services through the Internet, telephone and other technologies.(Al-Sayyari, 2003).

However, the other side of it carries with it many important risks related to the security and integrity of electronic accounting systems, given that the development in computers and information technology has not been accompanied by development in terms of practices and controls, as well as in terms of knowledge, experience and awareness of workers in those facilities. (Abu Shaybah & Al-Qatimi , 2017)

As a result, a new and large responsibility has emerged for the enterprise's information systems management, which is the necessity of providing all necessary means to ensure that these systems continue to function properly while developing plans to address the risks, that can likely cause them to stop working, and restart them as quickly as possible. In a parallel manner, a responsibility has emerged in front of the internal audit unit which is the necessity of providing confirmation to the senior management, which ensures the proper functioning of this department as planned. (Abu Shaybah & Al-Qatimi , 2017)

Based on the above, this research focuses on highlighting the role of the internal auditor in reducing the risks resulting from the use of electronic accounting information systems.

2 The Study Problem

Recently, Saudi companies have been tending to increase investment in the field of communications and information technology because of its great role in achieving the goals of the Saudi Vision 2030 and adapting to the changing and significantly developing business environment. Investment in this field helps to:

i. Support the national economy and advance development.

ii. Develop operational effectiveness.

iii. Enhance the ability to innovate and develop communications and information technology services to meet the requirements of the business environment.

iv. Develop the capabilities and skills of human resources.

v. Strengthen customer relationships.(1)

Despite the benefits that Saudi companies have gained from information technology and computer software, their excessive use has been accompanied by many problems, such as the introduction of wrong data intentionally or unintentionally, unauthorized access to data and other problems that have had a negative impact on the performance of the company. This is certainly what the study of the researcher Ahmed Abu Musa (2006) revealed, as half of the Saudi organizations suffer financial losses due to internal and external security violations of computerized information systems.

To attain maximum benefit from information technology, many companies worked to reduce the risks associated with it through compliance with the regulations and standards issued by the responsible authorities and also train their employees on computerized information systems. (Al-Sayyari, 2003)

In this particular aspect, internal auditors can play great role in providing assurance and supervision regarding the adherence of the policies and procedures followed in order to

(1) Report of the Communications and Information Technology Commission for the year 2015.

ensure that the work is performed to the greatest amount of efficiency and effectiveness. This will help to reduce errors and breaches that have a negative impact on the performance of the company. (Ekarim, 2019)

Based on the above, this study seeks to **answer the following questions**:

i. Do the elements of professional competence (certificates, expertise, and educational qualifications) such as provide an internal auditor with the necessary skills and capabilities that help in reducing the risks of electronic accounting information systems?

ii. Is the internal auditor fully independent, which increases his ability to reduce the risks of electronic accounting information systems?

iii. Does the diversity of specializations help the internal auditor department to reduce the risks of electronic accounting information systems?

iv. Does the support that the internal auditor receives from senior management help reduce the risks of electronic accounting information systems?

v. Does the internal auditor's knowledge of the structure and nature of electronic accounting information systems help in reducing their risks?

3 The Importance of the Study

The research derives its importance in several aspects:

i. As internal auditors are charged with independently verifying whether the organization's controls are designed adequately and operating effectively as management intends; this study highlights the role that they can play in assisting management to achieve its objectives, and preserve the company’s assets from damage, loss and misuse in order to achieve high quality services and provide accurate information to decision makers.

ii. Tries to direct the interest and efforts of the company’s management to activating the role played by the internal auditor and raising his efficiency in providing the information necessary to reduce the risks of electronic accounting information systems.

iii. Clarifies the role played by the internal audit in addressing the problems that accompany the use of electronic accounting information systems, which may arise as a result of the presence of a number of gaps in the controls over these systems, which may negatively affect the performance of the company.

iv. Attempts to develop the advisory role of the internal auditor by relying on it to make recommendations that could increase the efficiency of electronic accounting information systems in companies.

v. From the researcher's point of view, there are no recent studies looking at the same subject in the Saudi environment, this is despite the fact that half of the Saudi companies suffer financial losses as a result of security breaches in their electronic accounting information systems. (Abu-Musa, 2006)

4 Objectives of the Study

This research attempts to achieve the following important goals:

i. Clarify the role played by the internal auditor to protect the company's assets from fraud and misuse, the most important of which is electronic accounting information systems.

ii. Give the responsible authorities an overview of the most important risks to which electronic accounting information systems are exposed in Saudi companies and the reasons that lead to the occurrence of such risks.

iii. Identify the most important factors affecting the internal auditor's role in mitigating the risks of electronic accounting information systems.

iv. Provide recommendations that may help improve the role of internal audit units in Saudi companies.

5 Study hypotheses

This section reviews the hypotheses of the study based on the literature and the research questions mentioned above.

H_1: The professional competence of the internal auditor helps reduce the risks of electronic accounting information systems.

H_2: The internal auditor enjoys complete independence, which increases his ability to reduce the risks of electronic accounting information systems.

H_3: The diversity of specializations of the internal audit unit helps reduce the risks of electronic accounting information systems.

H_4: Supporting the senior management of the internal audit unit helps reduce the risks of electronic accounting information systems.

H_5: The internal auditor's knowledge of the structure and nature of the work of electronic accounting information systems help reduce the risks of electronic accounting information systems.

6 Literature Review

In the beginning, the study of the researcher Hamza Mohamed Mahmoud Akrim, which was conducted in (2019), which attempted to develop the efforts of the internal auditor in the banking sector to reduce the risks of electronic accounting information systems, which were applied to a group of Libyan banks. The study concluded that the professional competence of the internal auditors greatly affects their ability to reduce the risks of electronic accounting information systems. Also, the lack of sufficient knowledge of the internal auditors to program, analyze and design electronic operating systems weakens their ability to reduce the risks of electronic accounting information systems. In addition to that, the study conducted by Md. Shariful Islam, Nusrat Farah and Thomas F. Stafford (2018), which aimed to clarify the most important factors that are involved in auditing cybersecurity by the internal auditor. The following results were reached:

- Professionalism and comprehensive risk assessment by the internal auditors play a large and positive role in auditing cybersecurity.
- The support of the governing body related to governance plays a large and effective role in auditing cybersecurity.
- On the contrary, there is no major role for the audit committee and risk management officer.
- Also, there is an average effect of the professional certificates the internal auditor possesses on cyber security audits such as CPA and CISA.

Also, the study conducted by researchers Ibrahim Ali Abu Shaybah and Muhammad Moftah Al-Qatimi (2017), which aimed to identify the most important risks resulting from the use of electronic accounting information systems and the extent of their awareness in the commercial banks in the Misurata municipality and its reasons. The study concluded that the most important causes of these risks relate to bank employees as a result of lack of experience, awareness and training, in addition to reasons related to the bank's administration; and also, as a result of the lack of clear and written policies and weak procedures and controls applied by the bank. The researcher, Omar Al-Sir Al-Hassan Muhammad, also conducted a study (2016) that aimed to analyze the most important factors that affect the effectiveness of the internal audit department in reducing the risks of banking. The study reached several results, the most important of which are:

- The dependency of the internal audit department in Sudanese banks on the general manager negatively affects the bank's commitment to the principles and banking regulations.
- The lack of attention to the professionalism of the internal audit management staff negatively affects the effectiveness of the internal audit report.
- Also, the diversity of specialties of the internal audit department helps greatly to avoid bank risks.

Also, the study carried out by the researcher Muhammad Hisham Adnan Al-Lbabidi (2011), which aimed to clarify the most important factors affecting the role of the internal auditor in order to protect the computerized accounting information systems from electronic intrusion, which was applied to a sample of banks operating in Jordan. The study concluded that there is a significant role for the internal auditor in protecting computerized accounting information systems from electronic intrusion, which is represented in(Test security controls against incoming information of unknown origin and carry out empirical testing by making attempts to hack information in order to evaluate the effectiveness of existing controls). Also, there is also a significant impact of the professional competence of the internal auditors on their role in protecting computerized accounting information systems. Also, the study, which was conducted by the researcher Ahmed Abu Musa (2008), tried to study the impact of emerging

information technology on the activities of auditors and examine whether the assessments of information technology used in Saudi institutions differ based on the objective's evaluation and organizational characteristics of internal audit. The study concluded to several results:

- The internal auditors need to develop their knowledge and skills in the field of computerized information systems in order to complete their work as required.
- The internal auditors were all focused on traditional IT risks and controls, such as IT data integrity, privacy and security, asset protection, and application processing.
- Lack of sufficient interest in systems development and acquisition activities.
- The work of internal auditors interested in assessing information technology is related to several factors which include: audit objectives, type of industry, number of IT audit professionals on internal audit staff, and the presence of a new information association (CIS).

As for the last study, it was conducted by researcher Ahmed Abu Musa (2006) on a number of Saudi institutions. The study aimed to identify the most important threats facing computerized accounting information systems (CAIS) in Saudi institutions. The study concluded to several results:

- Nearly half of the Saudi respondent organizations suffer financial losses due to CAIS internal and external security violations.
- Among the most important of these violations are the following: (Wrong and deliberate entry of bad data, Unintended destruction of data by employees, Employees sharing passwords and Entry of computer viruses into CAIS).

Comment on literature review

As for the local studies that are related to the subject of the study, it is found that they are limited to a specific society, unlike this study, which was applied to most of the companies listed in the Saudi stock market, it is also considered old, especially since in recent years and with the presence of COVID-19, which was accompanied by a complete dependence on electronic devices, which in turn led to making companies more vulnerable to risks that threaten the security of electronic accounting information systems.

Therefore, the most important feature of this study is to shed light on the role of the internal auditor in reducing the risks that accompany the use of electronic accounting information systems in particular, especially since these risks have become no less important than other risks, with the modern and rapid technological development, which leads to an increase in such risks, as one of these risks is liable to expose the company to huge losses, such as a defect in the security of electronic systems, or one of them may stop working for a short period of time.

7 Theoretical Framework

- **The definition of internal audit**

As for the audit of information systems, the American Information Systems Review and Control Association (ISACA) defined it as a process designed to assess the internal control structure in a specific field, including verification of asset protection, data integrity, efficiency and effectiveness of the system. (El-Gammal, 2014)

- **Accounting Information Systems (AIS)**

An accounting information system (AIS) comprises the processes, procedures, and systems that capture accounting data from business processes; record the accounting data in the appropriate records; process the detailed accounting data by classifying, summarizing, and consolidating; and report the summarized accounting data to internal and external users (Turner & Weickgenannt, second edition).

It can use technology (in this case, it is called a modern or electronic information system, and the research focusses on this type because of the risks it entails compared to the other type) or use paper and pens (here, it is called a manual information system) and also can use both together (Al-Diyash, 2019).

Potential risks to electronic accounting information systems: (Abd El, Salam, 2019):

- The inefficiency of the internal control systems applied by the company's management to protect the electronic accounting information systems.
- Failure to separate accounting functions and functions related to the company's accounting information systems.

- Lack of clear policies and specific programs regarding the security of the company's accounting information systems.
- Lack of the necessary expertise, adequate training, scientific background and skills required to carry out the work by the company's employees.
- The lack of accurate description of the functional and administrative structure that defines the responsibilities and powers of each person within the organizational structure of the company.
- Insufficient attention to examining the professional career history of new employees may affect the rule of employing the right person in the right place.
- The lack of sufficient awareness among employees of the necessity of checking any new programs or magnetic disks when they are inserted into computers.

8 Research Design

- Study Method

Based on the nature of the study, the objectives it seeks to achieve, and the data to be obtained, and based on the questions that the study sought to answer, the study used the descriptive analytical approach that depends on the study of the phenomenon, as it exists in reality, and contributes to its accurate description and clarifies its characteristics by collecting, analyzing and interpreting information, and then applying the results in its light.

- Data Collection Sources

Primary sources: The main study tool (initial) was used, which is a questionnaire, and it was distributed to the study sample and the data collected using the statistical analysis program was analyzed.

Secondary sources: It is represented in books, scientific journals, studies, research, and electronic search in databases that deal with the subject of the study.

- **Study Community & Study Sample**

The study community consists of internal auditors working in companies listed on the Saudi stock market. 142 questionnaires were randomly distributed to the study population and 93 valid questionnaires were retrieved for statistical analysis at a rate of 65%, and the following tables show the distribution of the study sample according to their personal data.

- **Study Tool Contents**

In order to achieve the objectives of the study and to choose hypotheses, the research tool was designed, which is a questionnaire that includes various aspects about the factors affecting the role of the internal auditor in reducing the risks of electronic accounting information systems after reviewing the relevant references. The questionnaire consisted of two parts: the first part included a set of items aimed at obtaining the personal data that characterizes the study sample, while the other part included items that measure the main variables of the study.

- **Study Tool Correction**

Table 1: The study tool was corrected by five points according to the Likert scale of approval

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
5	4	3	2	1

The study tool was designed according to the five-point Likert Scale (see Table 1), so that the items of the scale are presented to the study sample, and for each item, five answers determine their level of agreement with it. The answers are given numerical weights that represent the degree of answering the paragraph, which is useful in expressing the level, low to high approval of the paragraphs and items of the scale. Table 2 illustrates the same. And to determine the level of approval for each of the study paragraphs, the arithmetic mean value and the value of the relative weight were relied on, and the following Table 2 shows the levels of approval based on five levels (very low, low, medium, high, very high).

Table 2: Levels of approval of the study's paragraphs and axes

Levels of approval	Very high	High	Medium	Low	Very low
Category limits	From 4.2 to 5	From 3.4 to 4.19	From 2.6 to 3.39	From 1.8 to 2.59	From 1 to 1.79

- The Validity of the Study Tool (The Questionnaire)

The researcher made sure of the validity of the study tool through internal consistency that the consistency of each paragraph of the tool with the axis is known to which this paragraph belongs. The study tool contains five axes (professional competence, independence, diversity of specializations, Supporting the senior management, internal auditor's knowledge). In order to calculate the internal consistency validity, the Pearson correlation coefficient was calculated, through which the correlation coefficients were calculated between the degree of each paragraph and the total degree of the axis to which it belongs. The results showed that there is internal consistency between each paragraph and the axis to which it belongs and their relevance to the measurement of what they were prepared to measure.

- Study Tool Stability (The Questionnaire):

The stability of the questionnaire means that it gives almost the same results if it is repeated more than once on the same people in similar circumstances. The stability of the questionnaire was calculated by using Cronbach's Alpha coefficient.

Table 3: Stability coefficients by Cronbach's alpha method.

Axis	Number of paragraphs	Cronbach's Alpha coefficient
THE PROFESSIONAL COMPETENCE OF THE INTERNAL AUDITOR.	8	0.783
Independence of the internal auditor.	4	0.717
Diversity of disciplines for the internal audit department.	5	0.922

Support of senior management to the internal audit department.	9	0.819
The internal auditor's knowledge of the structure and nature of the work of electronic information systems.	8	0.632
Total	**34**	**0.908**

It is clear from Table 3 that the stability coefficient of the Cronbach's alpha method ranged from 0.632 as a minimum for the fifth axis to 0.922 as a maximum for the third axis, while the stability coefficient for the questionnaire as a whole was 0.908, which is considered a high value for Cronbach's alpha.

- The Statistical Methods Used in the Study

In this study, the researcher relied mainly on the use of the Statistical Package for Social Sciences-SPSS V.26 in the processing and analysis of the data obtained through the study tool (the questionnaire), and the following are the most important descriptive and inferential statistical methods that were used. It is used in processing data for this study (Mean, Standard deviation, Pearson correlation, Cronbach's alpha and split-half coefficient and One Sample T-test).

- Analysis of the Results Related to the First Hypothesis

The professional competence of the internal auditor helps reduce the risks of electronic accounting information systems. To test this hypothesis, the arithmetic mean, standard deviation, relative weight, and order were calculated for each of the paragraphs of the first axis, and Table 4 shows the results of the analysis. The average responses of the sample members on all the paragraphs of the first axis "The professional competence of the internal auditor" ranged between 3.01 out of 5 as a minimum, with a relative weight of 60.2%, and a "medium" level of approval for the paragraph that states. "The traditional internal auditor can efficiently audit data systems electronically", to 4.63 out of 5 as a maximum, with a relative weight of 92.6%, and a "very high" level of approval for the paragraph that states. "The lack of experience of the internal auditor leads to the failure to discover and correct errors in the electronic operating accounting information". Also,

the average answers of the sample members on the axis of "The professional competence of the internal auditor" as a whole was 3.81 out of 5, with a relative weight of 76.2%, and a "high" level of approval.

Table 4: Analysis of the results related to the first hypothesis

	Paragraph	Arithmetic mean	Standard deviation	Relative weight	Test value (t)	Significance level	Approval level	Order
1	The scientific qualification of the internal auditor is commensurate with the data operating environment electronically.	3.84	0.86	76.8%	9.37	0.00	High	4
2	The traditional internal auditor can efficiently audit data systems electronically.	3.01	0.90	60.2%	0.11	0.91	Medium	8
3	Adequate qualification of the internal auditor reduces the risks of electronic information systems.	4.25	0.64	85.0%	18.89	0.00	Very high	2
4	The lack of experience of the internal auditor leads to the failure to discover and correct errors in the electronic operating accounting information.	4.63	0.51	92.6%	31.14	0.00	Very high	1
5	The internal auditor has sufficient knowledge of hacking methods and means of ensuring information security in the electronic system.	3.35	1.00	67.0%	3.44	0.00	Medium	7
6	The internal auditor has the ability to assess the significant risks related to electronic information systems.	3.52	0.76	70.4%	6.54	0.00	High	6
7	The internal auditor's commitment to professional standards and principles of work that would help reduce electronic operating risks.	4.16	0.42	83.2%	26.38	0.00	High	3
8	The internal auditor possesses the appropriate professional certificates that help him in dealing with the risks of electronic operation.	3.75	0.96	75.0%	7.54	0.00	High	5
	Total	3.81	0.49	76.2%	15.92	0.00	High	

T-value at 92 degrees of freedom and 0.05 level of significance at 1.99

To test the hypothesis of the first study, it was verified that the average answers on this axis are equal to the value 3, which expresses the degree of neutrality, where the calculated “t” test value was equal to 15.92, which is greater than the tabular “t” value at the significance level of 0.05. This indicates the positive attitude of the sample members towards this axis.

Thus, the researcher concludes that the validity of the first hypothesis which states that "The professional competence of the internal auditor helps reduce the risks of electronic accounting information systems." This result is in agreement with the results of (Islam et al., 2018) (Muhammad, 2016) (Ekarim, 2019) (Al-Lbabidi, 2011).

- Analysis of the Results Related to the Second Hypothesis

The internal auditor enjoys complete independence, which increases his ability to reduce the risks of electronic accounting information systems. To test this hypothesis, the arithmetic mean, standard deviation, relative weight and order were calculated for each of the paragraphs of the second axis and Table 5 shows the results of the analysis.

Table 5: Analysis of the results related to the second hypothesis

	Paragraph	Arithmetic mean	Standard deviation	Relative weight	Test value (t)	Significance level	Approval level	Order
1	The internal auditor has sufficient authority to perform his duties when auditing electronic information systems.	4.06	0.72	81.2%	14.27	0.00	High	3
2	The internal auditor has the ability to formulate the results of the electronic information systems audit without responding to any external impact.	3.91	0.75	78.2%	11.80	0.00	High	4
3	The internal auditor has the ability to collect the required evidence when checking electronic information systems.	4.08	0.68	81.6%	15.26	0.00	High	2
4	Failure to accurately describe the functional and administrative structure that determines the responsibilities and powers of each person within the organizational structure of the company that would increase the risks of electronic operation.	4.46	0.68	89.2%	20.60	0.00	Very high	1
	Total	4.13	0.52	82.6%	20.91	0.00	High	

T-value at 92 degrees of freedom and 0.05 level of significance at 1.99

The average responses of the sample members on all paragraphs of the second axis “independence of the internal auditor” ranged between 3.91 out of 5 as a minimum, with a relative weight of 78.2%, and a “high” level of approval for the paragraph that states “The internal auditor has the ability to formulate the results of the electronic information systems audit without responding to any external impact.", to 4.46 out of 5 as a maximum, with a relative weight of 89.2%, and a "very high" level of approval for the paragraph that states " Failure to accurately describe the functional and administrative structure that determines the responsibilities and powers of each person within the organizational structure of the company that would increase the risks of electronic operation. Also, the average answers of the sample members on the axis of "Independence of the internal auditor" as a whole (4.13 out of 5), with a relative weight of 82.6%, and a "high" level of approval.

To test the hypothesis of the second study, it was verified that the average answers on this axis are equal to the value (3), which expresses the degree of neutrality, where the calculated “t” test value was equal to 20.91, which is greater than the tabular “t” value at the level of significance of 0.05. This indicates the positive attitude of the sample members towards this axis. Thus, we conclude the validity of the second hypothesis, which states that " the internal auditor enjoys complete independence, which increases his ability to reduce the risks of electronic accounting information systems.” This result is in agreement with the results of (Muhammad, 2016).

- **The body that the chief internal auditor relies on**

Table 6: The body that the chief internal auditor relies on

The body	Number	PERCENTAGE
Board of directors	24	**25.8**
Chairman	46	**49.5**
CEO	10	**10.8**
Board of auditors	2	**2.2**
Audit committee	9	**9.7**
Executive management	1	**1.1**
Other, please specify	1	**1.1**
Total	**93**	100.0

It is evident from Table 6 that 49.5% of the directors of the internal audit department rely on the chairman of the board of directors, 25.8% rely on the board of directors, 10.8% rely on the chief executive, 9.7% rely on the audit committee, 2.2% rely on the board of auditors, 1.1% rely on the executive management, and 1.1% rely on the audit committee elected by the partners.

- **The authority to which the audit reports are submitted**

Table 7: The authority to which the audit reports are submitted.

The authority	Number	PERCENTAGE
Board of directors	65	**69.9**
Chairman	9	**9.7**
CEO	12	**12.9**
Board of auditors	1	**1.1**
Audit committee	5	**5.4**
Other, please specify	**1**	**1.1**
Total	93	100.0

It is clear from Table 7 that 69.9% of the respondents reported that the internal audit reports are submitted to the board of directors, 12.9% reported that they are submitted to the CEO, 9.7% reported that they are submitted to the chairman of the board of directors, 5.4% reported that they are submitted to the audit committee, 1.1% reported that it is submitted to the board of auditors, and 1.1% reported that it is submitted to the audit committee elected by the partners.

- **Analysis of the Results Related to the Third Hypothesis**

The diversity of specializations of the internal audit unit helps reduce the risks of electronic accounting information systems. To test this hypothesis, the arithmetic mean, standard deviation, relative weight and arrangement were calculated for each of the paragraphs of the third axis, and Table 8 shows the results of the analysis.

Table 8: Analysis of the results related to the third hypothesis

	Paragraph	Arithmetic mean	Standard deviation	Relative weight	Test value (t)	Significance level	Approval level	Order
1	The diversity of specializations for the employees of the Internal Audit Department leads to the ease of discovering the risks of electronic data operation.	4.43	0.58	88.6%	23.84	0.00	Very high	3
2	The diversity of specializations for the employees of the Internal Audit Department leads to work in a team spirit, thus reducing the risks related to electronic operation.	4.38	0.69	87.6%	19.23	0.00	Very high	5
3	The diversity of specializations would lead to providing solutions to address the risks associated with electronic operation.	4.48	0.52	89.6%	27.33	0.00	Very high	1
4	The diversity of specializations can make the internal auditor more knowledgeable about internal control systems and this helps to avoid the risks of electronic operation.	4.45	0.54	89.0%	25.83	0.00	Very high	2
5	The diversity of specializations for the Internal Audit Department increases the internal auditor's knowledge of the most important reasons that threaten the security of electronic information systems and the significant risks associated with them.	4.42	0.56	88.4%	24.53	0.00	Very high	4
	Total	4.43	0.51	88.6%	27.21	0.00	Very high	

T-value at 92 degrees of freedom and 0.05 level of significance at 1.99

The average responses of the sample members on all paragraphs of the third axis "Diversity of specializations for the internal audit department" ranged between 4.38 out of 5 as a minimum, with a relative weight of 87.6%, and a "very high" level of approval for the paragraph that states " The diversity of specializations for the employees of the internal audit department leads to work in a team spirit, thus reducing the risks related to electronic operation, to 4.48 out of 5 as a maximum, with a relative weight of 89.6%, and a “very high” level of approval for the paragraph that states “The diversity of specializations would lead to providing solutions to address the risks associated with electronic operation.” Also, the average answers of the sample members on the axis of

"Diversity of specializations for the internal audit department" as a whole were 4.43 out of 5, with a relative weight of 88.6%, and a "very high" level of approval.

To test the hypothesis of the third study, it was verified that the average answers on this axis are equal to the value (3), which expresses the degree of neutrality, where the calculated “t” test value was equal to 27.21, which is greater than the tabular “t” value at the significance level of 0.05. This is due to the positive attitude of the sample members towards this axis, and thus we conclude the validity of the third hypothesis which states that “The diversity of specializations of the internal audit unit helps reduce the risks of electronic accounting information systems.” This result is in agreement with the results of (Muhammad, 2016).

- **Analysis of the Results Related to the Fourth Hypothesis**

Supporting the senior management of the internal audit unit helps reduce the risks of electronic accounting information systems. To test this hypothesis, the arithmetic mean, standard deviation, relative weight and arrangement were calculated for each of the paragraphs of the fourth axis, and Table 9 shows the results of the analysis.

The average responses of the sample members on all the paragraphs of the fourth axis “Support of the senior management of the internal audit unit” ranged between 3.97 out of 5 as a minimum, with a relative weight of 79.4%, and a “high” level of approval for each of the paragraph that states “The senior management shall employ the most recent methods used in the field of electronic accounting information control systems, with work to train auditors on them, and the paragraph that states “The company’s senior management works to provide sufficient independence for the internal auditor with regard to electronic activities,” and the paragraph that states “Senior management provides adequate financial support to the internal auditor in order to continue the audit process well and achieve the planned goals, to 4.42 out of 5 as a maximum, with a relative weight of 88.4%, and a “very high” level of approval for the paragraph that states “Insufficient attention to the examination of the career and professional history of new employees would increase the risks of electronic operation.

Table 9: Analysis of the results related to the fourth hypothesis

	Paragraph	Arithmetic mean	Standard deviation	Relative weight	Test value (t)	Significance level	Approval level	Order
1	Ongoing training of internal auditors in the areas of information technology by senior management reduces the risks of electronic information systems.	4.29	0.50	85.8%	24.80	0.00	Very high	2
2	The internal auditor presents proposals that he deems appropriate for developing electronic systems, while ensuring that they were taken into consideration by senior management.	4.11	0.45	82.2%	23.55	0.00	High	4
3	The top management works to attract and employ highly qualified internal auditors, while developing their skills through continuous training on the latest methods used in electronic operation.	4.04	0.72	80.8%	13.95	0.00	High	5
4	The senior management shall employ the most recent methods used in the field of electronic accounting information control systems, with work to train auditors on them.	3.97	0.74	79.4%	12.55	0.00	High	7
5	The senior management of the company provides adequate independence for the internal auditor regarding the audit of electronic activities.	3.97	0.68	79.4%	13.67	0.00	High	7
6	Good interaction between internal audit and senior management reduces the risks of electronic operation	4.20	0.58	84.0%	19.97	0.00	Very high	3
7	Insufficient attention to the examination of the career and professional history of new employees would increase the risks of electronic operation	4.42	0.76	88.4%	18.09	0.00	Very high	1
8	Senior management provides adequate financial support to the internal auditor in order to continue the audit process well and achieve the planned goals.	3.97	0.54	79.4%	17.26	0.00	high	7
9	Top management deals seriously with the internal audit recommendations.	3.99	0.56	79.8%	17.00	0.00	high	6
	Total	**4.11**	**0.40**	**82.2%**	**26.72**	**0.00**	high	

T-value at 92 degrees of freedom and 0.05 level of significance at 1.99

Also, the average answers of the sample members on the axis of "Support of senior management of the internal audit unit" as a whole (4.11 out of 5), with a relative weight of 82.2%, and a "high" level of approval.

To test the hypothesis of the fourth study, it was verified that the average answers on this axis are equal to the value (3), which expresses the degree of neutrality, where the calculated "t" test value was equal to 26.72, which is greater than the tabular "t" value at the significance level of 0.05, this is due to the positive attitude of the sample members towards this axis, and thus it can be concluded that the validity of the fourth hypothesis, which states that "Supporting the senior management of the internal audit unit helps reduce the risks of electronic accounting information systems." This result is in agreement with the results of both (Islam et al., 2018).

- Analysis of the Results Related to the Fifth Hypothesis

The internal auditor's knowledge of the structure and nature of the work of electronic accounting information systems helps reduce the risks of electronic accounting information systems. To test this hypothesis, the arithmetic mean, standard deviation, relative weight and arrangement were calculated for each paragraph of the fifth axis, and Table 10 shows the results of the analysis.

Table 10: Analysis of the results related to the fifth hypothesis

	Paragraph	Arithmetic mean	Standard deviation	Relative weight	test value (t)	Significance level	Approval level	Order
1	The internal auditor has sufficient knowledge of dealing with international information networks and how to benefit from them.	3.70	0.69	74.0%	9.79	0.00	High	7
2	The internal auditor's lack of knowledge of electronic operation of the information limits his ability to collect sufficient evidence.	4.27	0.75	85.4%	16.23	0.00	Very high	3
3	The internal auditor's lack of knowledge of the fundamentals of the computer and the possibility of its operation increases the risks resulting from the use of electronic information systems.	4.45	0.60	89.0%	23.36	0.00	Very high	1

	Paragraph	Arithmetic mean	Standard deviation	Relative weight	test value (t)	Significance level	Approval level	Order
4	The internal auditor's lack of knowledge of programming, analysis and design of electronic operating systems for information increases its risks.	4.23	0.64	84.6%	18.33	0.00	Very high	4
5	The lack of experience of the internal auditor related to systems for controlling electronic data operation leads to an increase in the risks associated with it.	4.34	0.60	86.8%	21.65	0.00	Very high	2
6	The participation of the internal auditor in the design of electronic information systems helps reduce the risks resulting from their use.	3.90	0.69	78.0%	12.58	0.00	High	5
7	The internal auditor has clear and written work guides specifying the procedures to be followed when auditing electronic information systems.	3.83	0.56	76.6%	14.16	0.00	High	6
8	The internal auditor has sufficient knowledge of the most important reasons that threaten the security of electronic information systems.	3.55	0.68	71.0%	7.73	0.00	High	8
	Total	**4.03**	**0.35**	**80.6%**	**28.74**	**0.00**	High	

T-value at 92 degrees of freedom and 0.05 level of significance at 1.99

The average responses of the sample members on all the paragraphs of the fifth axis “The internal auditor’s knowledge of the structure and nature of the work of electronic accounting information systems” ranged between 3.55 out of 5 as a minimum, with a relative weight of 71%, and a “high” level of approval for the paragraph that states “The internal auditor has sufficient knowledge of the most important reasons that threaten the security of electronic information systems, to 4.45 out of 5 as a maximum, with a relative weight of 89%, and a “very high” level of approval for the paragraph that states “The internal auditor's lack of knowledge of the fundamentals of the computer and the possibility of its operation increases the risks resulting from the use of electronic information systems. Also, the average answers of the sample members on the axis as a

whole were 4.03 out of 5, with a relative weight of 80.6%, and a "high" level of agreement.

To test the hypothesis of the fifth study, it was verified that the average answers on this axis are equal to the value (3), which expresses the degree of neutrality, where the calculated “t” test value was equal to 28.74, which is greater than the tabular “t” value at the significance level of 0.05. This is due to the positive attitude of the sample members towards this axis, and thus it can be concluded that the validity of the fifth hypothesis which states that “The internal auditor's knowledge of the structure and nature of the work of electronic accounting information systems helps reduce the risks of electronic accounting information systems.”

9 Conclusions

The purpose of the study was to identify the role of internal audit in reducing the risks of electronic accounting information systems. By using the 93 responses of the internal auditors working in different companies listed in the Saudi capital market, it has been found that there are several factors that have an impact on the role of the internal auditor responsible for auditing electronic accounting information systems. Perhaps the most important of them are: **first**, the professional competence of the internal auditor, through data analysis, it is noted that in order for the internal auditor to audit electronic accounting information systems with high efficiency and work to reduce the risks they face, he must possess the scientific qualification and practical experience that are commensurate with the nature of the work of these systems, it has also been noticed that the sample members need to develop their scientific qualifications, work on continuous training, and acquire professional certificates that are commensurate with the environment of electronic accounting information systems. **Second**: the independence of the internal auditor. It has been noted that the sample members enjoy a good degree of independence, which helps them when auditing electronic accounting information systems. **Third**: The diversity of specializations of the Internal Audit Department would provide a variety of experiences and skills for the audit team, and thus this helps to quickly discover the risks that affect electronic accounting information systems and ease their treatment (Muhammad, 2016) . **Fourth**: The support of the senior management of the Internal Audit Department with human and material capabilities and attention to the instructions and recommendations it

receives from the internal auditor would help in dealing with and limiting the risks of electronic accounting information systems. **Fifth**: The internal auditor's knowledge of the structure and nature of the work of electronic accounting information systems, the internal auditors must have at least a proper understanding of the basic components of the accounting information systems used by their companies and the risks that threaten their security. They also must have knowledge and awareness of their organizations' IT governance, risk management, and control processes (ANDERSON U. L., et al., 2017). Thus, the internal auditor's knowledge of the structure and nature of the work of electronic accounting information systems would help reduce the risks faced by these systems. The results of this study may benefit senior management, policy makers and auditors when developing an effective program to manage the risks of accounting information systems, because it addressed some of the important factors that have a significant impact on the role of the internal auditor in reducing the risks of these systems.

10 The Limits of the Study

Spatial limits: Companies listed in the Saudi stock market.

Time limits: The period of time during which the study will take place between 2020 and 2022.

Human frontiers: The study will be conducted on a sample of internal auditors working in Saudi companies, and therefore the circulation of data will be limited to them.

It is known that relying on the questionnaire to collect data is punctuated by a great deal of personal bias and failure to respond with credibility by respondents.

11 Recommendations

Based on the systematic linkage of the research problem and the obtained results, in conclusion, this report tries to present some recommendations that may have a positive impact in alleviating the problem:

i. The necessity of coordination and interaction between the Internal Audit Department and the Information Systems Department, with regard to the procedures and methods of internal control applied to electronic accounting information systems.

ii. Senior management should provide appropriate audit programs that include plans, policies, procedures and manuals that are compatible with the electronic operating environment of accounting information systems.

iii. Attention should be paid to qualifying the internal auditor and holding training courses regarding the electronic operating environment in order to help him deal with the nature of electronic accounting information systems.

iv. The internal auditor should continue to develop his skills and experiences and seek to obtain the appropriate professional certificates that help him in dealing with the electronic operating environment of information systems such as CISA.

v. The need to pay attention to the recommendations and suggestions provided by the internal auditor, which may be appropriate and help in developing electronic systems and reducing their risks.

vi. When auditing electronic accounting information systems, the diversity of specializations of the internal audit team should be taken into account because of its role in reducing the risks associated with it.

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