

Applying Expert Systems And Its Impact On Commercial Banks Internal Audit Quality: A Casae Study Commercial Banks In Jordan

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ARTICLE INFO ABSTRACT

The organization's ability to exploit knowledge represents a great competitive force that crystallizes around customer behaviors so that it can focus on its marketing activities through collecting, storing, and analyzing data in order to obtain a permanent competitive advantage based on knowledge extracted from so-called expert systems to obtain useful information and knowledge. In order to improve and develop the quality of decisions, which depend on the use of technology and analytical methodologies This study aimed to identify the impact of applying expert systems on the quality of internal auditing in Jordanian commercial banks. The descriptive and analytical approach was relied upon. Information was collected from a random sample of (206) employees in Jordanian commercial banks. The study found a statistically significant effect of applying large-scale systems (Devices, Software, Individuals) on the quality of internal auditing in all its dimensions (internal control, financial auditing, administrative auditing).

Keywords: expert systems, internal audit quality - commercial banks - Jordan.

JEL Classification: C58, G21

Introduction

Many concerned individuals attribute the causes of crises and collapses in business organizations to weaknesses in auditing systems and the failure of these organizations to adopt internal audit functions and utilize their reports. Additionally, there is a lack of interest in using auditing as a tool to activate control systems and ensure quality in products or services. As a result, many business organizations, both industrial and service-oriented, have established independent audit departments and are actively supporting them with qualified human resources to effectively achieve their goals (Bedard & Cannon, 2017).

The distinctive nature of internal audit activity is that individuals from within the organization carry out this work, whose mission is Evaluating the work of each department in the organization, and knowing whether the department is familiar with the tasks entrusted to it, and that it is equipped with employees, and that its records are correct and its work is consistent with the rest of the departments, in order to ensure that the employees of those departments carry out their work correctly and in a sound manner that is consistent with the policy or plan established by them. Before managing the organization (Zureigat & AL-Moshaigeh, 2014).

Internal audit represents an ongoing audit of operations and records that is carried out within the project by a specific functional body to carry out this work. The presence of such a functional body leads to ensuring that the accounting system is adequate and implemented in accordance with the planned procedures and also facilitates the achievement of the objectives of the internal control system. The function of internal audit is An activity that is independent from the rest of the activities and operations that are subject to the internal auditor's examination. The independence characteristic represents a critical criterion in the objectivity of the internal auditor's findings and recommendations and the extent of their suitability, acceptance, and reliance on them. Without this characteristic, the results, recommendations, and reports issued by the internal auditor may be far from objectivity (Messier et al. , 2017).

The internal auditor faces many challenges related to the audit process, which are assessing risks, evaluating the internal control structure, planning audit programs, and writing reports, in light of the tremendous technological acceleration, the entry of information technology, and the emergence of any reality.Changes in

the auditing environment and changes in various processes such as keeping accounts and recording financial transactions. This change led to the emergence of a threat to oversight and auditing, which in turn led to the need for auditors to use advanced and sophisticated methods, most notably expert systems (Mohammed and Abdullah, 2022).

Scientific progress, represented by expert systems, has increased the size of economic projects and also increased the diversity of their operations, which has contributed to the complexity of the resulting administrative problems based on auditing samples of accounting records and data. Accordingly, the importance of the quality of internal auditing for modern scientific management lies in maintaining. Available resources are considered a safety valve for accounting operations, and a major provider of accurate periodic data for various activities in order to make the appropriate and necessary decisions in addition to ensuring the safety of work (Al-Qasaima & Abu Salim, 2021).

The internal auditor can benefit from expert systems in the audit process in many areas of data analysis, analysis of available alternatives, and providing appropriate information to make decisions related to audit operations. This information contributes to increasing the effectiveness and efficiency of the decision-making process associated with the audit (Tsaaddit and Erian, 2019).

1. LITERATURE REVIEW

Expert systems have been defined as an electronic program that includes a set of knowledge that deals with a specific field, and which is based on a capable expert who has the ability to perform efficiently in his field of expertise (Surma, 2011), according to Gauzelina and Bentza (2017) it is: the user's ability to appropriately access data or information that contributes to making administrative decisions in a timely manner. El Sawy and Fiss (2016) defined it as: a set of matrices, mathematical models, and analytical methods that can be exploited in a systematic manner in order to extract information and knowledge that accompany supporting complex decision-making processes. According to Laudon and Traver (2014), expert systems consist of a set of dimensions, namely (Devices, software, and individuals).

Devices: These are the tangible physical means, which consist of computers and other electronic devices, which make up the infrastructure, and whose use has emerged at the present time to automate business, process and analyze data, and display information in organizations (Belov et al., 2017). It can be noted that physical equipment is the primary driver of information activities in organizations, such as input, processing, and output in any information system (Laudon et al., 2003). The physical components can be considered a computer and several other devices attached to it in a connected manner, which enables them to carry out work to the fullest extent in an effort to implement the strategies and plans built in organizations, which further increases their chances of success (Krajewski & Ritzman, 2005).

Computer technologies are considered the material and tangible basis of the information technology infrastructure, as computers are considered the backbone and basic component that must be available to enable the operation of all other components, such as software, databases, and networks, as it is necessary to have this main component to efficiently accomplish the tasks of the aforementioned components. and effectiveness (Laudon and Traver, 2014).

Software: Software can be defined as a number of programmed and detailed instructions that aim to carry out control, organization and coordination of the physical equipment and computers in the information system (Laudon et al., 2003). They are the information systems and orders that direct the work of the equipment by human resources with the aim of To reach certain results, this software can be classified into systems software and application software, which is used to save time, effort, and money and contribute to the success of the work of organizations (Belov et al., 2017).

Software in business organizations is usually divided into two main types: system software and application software, where system software is considered a common example in the work of industrial organizations, which can be defined as: general programs that are managed by a computer, and can be linked to production equipment and machines and consist of many Of devices interconnected with each other and sub-peripherals (Laudon et al., 2003). Application software is the software that service organizations usually rely on and which is written with the aim of performing many functions specified by end users. This software is considered somewhat simple in comparison. With system software (Preimesberger, 2012). As part of their work, organizations plan to permanently adopt modern software in their strategies due to the various advantages it provides that contribute to the development of their internal activities. Therefore, software can be integrated into organizations at all levels, in order to achieve many different goals, the most important of which is that this software provides capabilities. High storage capacity, and the ability to analyse, classify, and summarize data in a way that serves decision makers and users in general, in addition to being capable of continuous development and updating, and allowing it to be used and shared (Ferenc, et al, 2014).

Individuals: They are the organization's employees who are developed and prepared with the necessary skills and who possess experience and competence in using and dealing with technology, as they represent the end users of the software and equipment (Rizzo and Longo, 2020)

The human element, which constitutes the human resources of organizations at the present time (Ojala, 2013), and its connection with information technology has become a major and integral connection, as human resources in organizations adopt qualified and trained functional elements to deal with this technology and accomplish the organization's tasks, which is considered one of the most important components of the culture of Information, which leads to the implicit accumulation of knowledge in the minds of workers in organizations (Abu Ghoneim, 2007). Human resources are considered to be a strategic approach adopted by organizations to make future decisions and plans by translating them into policies and programs aimed at providing the workforce and providing them with the necessary learning and skills, and developing them through special programs that enable them to harmonize technology in organizations and provide them with what is necessary to use this technology correctly (Armstrong, 2009).

With the impact of information technology on organizations, many prominent trends are emerging at the present time, such as thinking about creating flexible structures for human resources management, and the trend towards adopting information technology for human resources. From here, the importance of developing human resources has emerged as an effective factor in implementing strategies in organizations, because of its achievement. Increase in productivity and achieve a good market position in the business environment (Preimesberger, 2012).

On the other hand, internal audit operations in business organizations are credible in detecting defects in business implementation procedures, as adherence to the control system and its requirements is extremely important, which generates a reaction from those applying for fear of revealing matters that they do not wish to reveal, and they may stand in the way of finding ways. For camouflage and cover (Pashaki and Kheradyar, 2015).

Internal audit is an independent evaluation device located within the organizational structure of the economic unit and is considered one of the means of internal control. The aim of its establishment is to verify sufficient and applied means according to what was planned (Abbas, 2014). Internal audit is known as "an internal body or auditors affiliated with the economic unit and that In order to protect the economic unit's funds and to achieve management objectives such as achieving the greatest possible administrative efficiency and productivity for the economic unit and encouraging commitment to administrative policies" (Bedard & Cannon, 2017).

Kieso & Weygandt (2011) described internal audit as a strategic goal that refers to adding value based on increasing and improving the chances of achieving the organization's goals, improving procedures and operations, and then reducing risks to acceptable levels. The importance of internal audit is evident in determining the extent of the function's ability to achieve added value. Chirica (2016) pointed to the advisory role of internal audit, which aims to add values to the economic unit. The importance of the internal audit function lies in that it is one of the most important functions of the economic unit that distinguishes it. Glover et al. (2017) stated that one year of internal audit is equivalent to the work of... Three years of external audit. Tommy and Boghazi (2018) indicated that internal audit has three basic dimensions: (financial audit, administrative audit, and internal control).

Financial Audit: which is verifying the validity of financial data in accordance with international accounting standards and ensuring their validity and fairness (Aini and Nahariah, 2018). We find that auditing is related to accounting, but it is an independent specialty in itself, and the auditor's job is to collect evidence to ensure the validity of the data. or there is some error, the financial audit process aims to provide material evidence to confirm the validity or otherwise of the financial statements after examining those data in all aspects, and to give a true and fair picture of those reports, to increase the value and credibility of the financial statements issued by management and then reassure those concerned with those financial statements to reduce risk. With investors. There are two basic branches of financial auditing: internal auditing and external auditing (Chirica, 2016).

Financial auditing is the study of the financial entity of an institution, such that the study is in-depth, highly sensitive and precise, and its ultimate goal is to formulate a certified and approved financial report, which later becomes a basic reference that can be relied upon by concerned parties and various stakeholders. Such as: investors, banks, and tax authorities, for years to come. (Kieso & Weygandt, 2011).

Administrative auditing: is to ensure the extent to which financial and operational information can be relied upon and its integrity in organizations, as well as the means used to identify, classify and measure this information (Soni et al, 2018). The internal audit system constitutes the procedures and matters related to the functions of the accounting system and financial reports. Rather, it extends to include all administrative and organizational aspects, starting with the organization's plan and programs, passing through the organizational structure, and ending with the means and tools necessary to achieve them. (Al-Thanibat, 2015).

Administrative control is defined as being represented in the organizational chart and all the methods and procedures that are primarily concerned with production efficiency and adherence to established administrative policies. These procedures are usually linked indirectly to the financial aspects and accounting records. Among what this control includes is the study of time and movement, the use of statistical analysis methods, the preparation of employee training programs, and monitoring. Quality (Kavi, 2014).

Administrative control is defined as being represented by the organizational chart and all the methods and procedures that are primarily concerned with production efficiency and adherence to established

administrative policies. These procedures are usually linked indirectly to the financial aspects and accounting records. Among what this control includes is the study of time and movement, the use of statistical analysis methods, and the preparation of employee training programs. and quality control (Kavi, 2014).

Internal control: It is ensuring that the systems used in organizations are sound and appropriate and suggesting any improvements (Aini and Nahariah, 2018). When implementing its work, internal control adopts a regular and disciplined approach to evaluate and improve the effectiveness of internal control, risk management, and the organization's management system, in order to achieve Its objectives, protecting its assets and adding value.

The scope of internal audit work generally includes examining the adequacy and effectiveness of the internal control system and the quality of performance when individuals and organizational units in the organization carry out their responsibilities, for the purpose of verifying whether the systems provide assurance that the company's objectives are being achieved effectively and economically. (Al-Thanibat, 2015).

There are many previous studies that focused on the issue of the impact of expert systems and the benefits they achieve in various fields in business organizations, whereas the study of Noordin et al. (2022) sought to identify auditors' perceptions regarding the contribution of expert systems to audit quality, and the results showed that there is an important contribution of the application of expert systems in raising the level of audit quality. as the study by Tsaaddit and Erian (2019) showed that expert systems play an important role in many areas of auditing, including improving efficiency and experience, planning, Internal control and reporting. The study by Al-Jubouri and Salman (2017) aimed to know the impact of expert systems on accounting information systems, the results showed that the application of expert systems positively affects accounting information systems, and that there is a positive correlation between employing the general divisions of expert systems and improving the informational elements of the cost system.

The study by Radi and Hamid (2017) aimed to shed light on the role of expert systems (electronic payments system) and their impact on the internal control controls of a sample of Iraqi banks registered in the Iraqi Stock Exchange, as its results showed that there is a positive impact of expert systems applications on internal control over the work of banks.

As for the study by Al-Bashtawi et al. (2015), their study aimed to identify the impact of applying expert systems in commercial banks on electronic audit procedures from the point of view of external certified accountants, study found that the requirements for implementing expert systems in commercial banks require preserving their assets and files that contain information and data about the bank's work, and reducing risks.

2. AIMS AND HYPOTHESIS

This study aims to identify the impact of applying expert systems on the quality of internal auditing in Jordanian commercial banks. Through reviewing the literature, there are three dimensions that constitute expert systems (Devices, Software, Individuals), and three dimensions that constitute the quality of internal auditing (internal control, financial auditing, administrative auditing). Moreover, using a thorough examination of the literature, this study brought up the following hypotheses

H1: There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of applying expert systems with their dimensions (Devices, Software, Individuals) on internal control in Jordanian commercial banks.

H2: There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of applying expert systems with their dimensions (Devices, Software, Individuals) on financial auditing in Jordanian commercial banks.

There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of applying expert systems with their dimensions (Devices, Software, Individuals) on administrative auditing in Jordanian commercial banks.

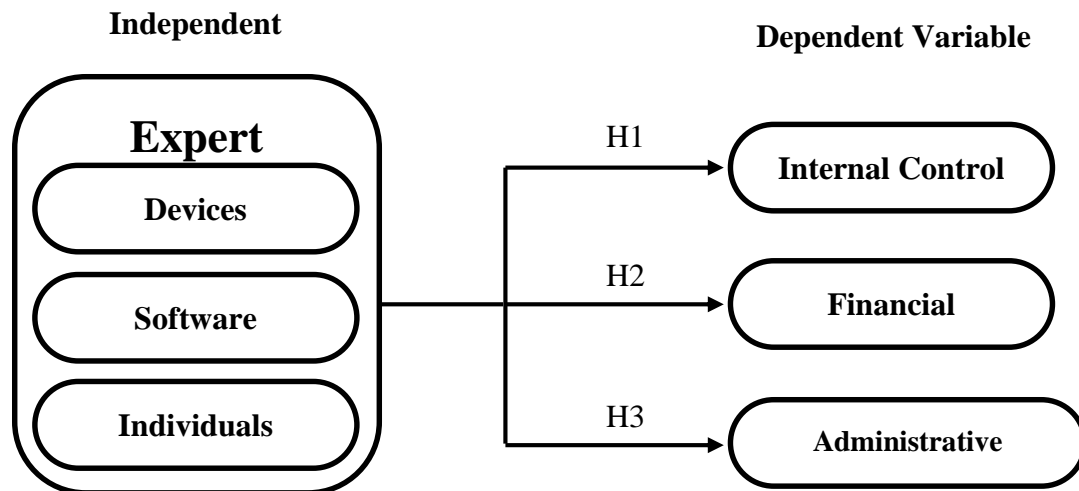


Figure 1. Theoretical framework

3. METHODOLOGY

To achieve the objectives of the study, the researcher adopted the descriptive analytical approach to analyze and classify data, in order to identify the impact of applying expert systems on the quality of internal auditing in Jordanian commercial banks. This approach is based on an accurate and integrated scientific description of the current situation or problem using statistical analysis, and is also based on related facts. It also includes analyzing, measuring and interpreting data, arriving at an accurate analysis of the phenomenon or problem and its results using inferential analysis, and presenting solutions and proposals to address it (Majid, 2018). The study population consists of (15) Jordanian commercial banks, according to the Securities Depository Center website (<https://www.sdc.com.jo>).

The sampling unit consisted of department directors, department heads, and auditors in the main centers of Jordanian commercial banks, and their number reached (206) individuals. The comprehensive survey method was followed, and (201) questionnaires were retrieved and (3) questionnaires were excluded. The questionnaires suitable for analysis reached (198) questionnaires, with a percentage of (96.1%).

4. Results And Discussion

The mean and standard deviation were calculated for the study variables, and the results were as follows:

Table 1. Mean for the expert systems dimensions

| | Dimensions | Mean | St.D | Level |
|----------------------------|-------------|-------------|------|-------------|
| Expert System | Devices | 3.82 | .730 | High |
| | Softwre | 3.84 | .770 | High |
| | Individuals | 3.95 | .620 | High |
| The mean as a whole | | 3.87 | | High |

It is clear from Table (1) that the mean of the independent variable “expert systems” as a whole is (3.87) with a high rating, the highest dimension is the (individuals) dimension, which was highly rated with a mean of (3.95) and a standard deviation of (0.62), followed by the (software) dimension, with a mean of (3.84), a standard deviation of (0.77), and a high rating, the mean of the (Devices) dimension was (3.82) and a high rating, which is the lowest mean among the dimentions. This indicates that there is a high level of application of the dimensions of expert systems in the Jordanian commercial banks under study

Table 2. Mean for the internal audit quality

| | Dimensions | Mean | St.D | Level |
|----------------------------------|-------------------------|-------------|------|-------------|
| Internal auditing quality | Internal Control | 4.31 | 0.48 | High |
| | Financial Auditing | 4.22 | 0.52 | High |
| | Administrative Auditing | 4.14 | 0.46 | High |
| The mean as a whole | | 4.22 | | High |

It is clear from Table (2) that the mean of the dependent variable “quality of internal audit” as a whole was (4.22) with a high rating, and that the (internal control) dimension was rated high with a mean mean of (4.31) and a standard deviation of (0.48), folwoed by (financial audit) with mean (4.22) and standard deviation of (0.52). Finally, the administrative audit dimension had the lowest mean, reaching (4.14). This indicates the high and sound interest of Jordanian commercial banks in the quality dimensions of internal auditing.

Table 3. Linear regression for testing hypothesis

| | | R | R² | Dimensions | Std. Error | B value | t-value | Sig. |
|----|-----------------------|----------|----------------------|-------------------------|-------------------|----------------|----------------|-------------|
| H1 | Expert systems | 0.560 | 0.314 | Internal Control | 0.048 | 0.56 | 11.67 | 0.000 |
| H2 | | 0.620 | 0.354 | Financial Auditing | 0.044 | 0.62 | 14.09 | 0.000 |
| H3 | | 0.550 | 0.303 | Administrative Auditing | 0.051 | 0.55 | 10.78 | 0.000 |

Table 4. Summary of hypotheses testing

| | Proposed Hypotheses | Decision |
|----|--|-----------------|
| H1 | There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of applying expert systems with their dimensions (Devices, Software, Individuals) on internal control in Jordanian commercial banks. | Accepted |
| H2 | There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of applying expert systems with their dimensions (Devices, Software, Individuals) on financial auditing in Jordanian commercial banks. | Accepted |
| H3 | There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of applying expert systems with their dimensions (Devices, Software, Individuals) on administrative auditing in Jordanian commercial banks. | Accepted |

The results in Table (3) related to the first hypothesis(H1) indicate that the value $R = 0.560$, which means that there is a positive correlation relationship with its value (56.0%), which is considered amoderate between expert systems and the internal control as one of the dimensions of internal audit quality. The value of the coefficient of determination is $R^2 = 0.314$, which means that the expert systems explains 31.4% of the variance in the internal control. The coefficient value of $B = 0.560$; that is, an increased in one unit in the independent variable (expert systems) leads to increasing of 56.0% in the dependent variable (internal control), and with a value of $T = 11.67$ at the level of significance $\text{sig} = 0.000$, which confirms the significance of the coefficient at the level of ($\alpha \leq 0.05$).

Regarding to the second hypothesis (H2), results in Table (3) indicate that the value $R = 0.620$, which means that there is a positive correlation relationship with its value (62.0%), which is considered a high between expert systems and the financial auditing as one of the dimensions of internal audit quality. The value of the coefficient of determination is $R^2 = 0.354$, which means that the expert systems explains 35.4% of the variance in the financial auditing. The coefficient value of $B = 0.620$; that is, an increased in one unit in the independent variable (expert systems) leads to increasing of 62.0% in the dependent variable (financial auditing), and with a value of $T = 14.09$ at the level of significance $\text{sig} = 0.000$, which confirms the significance of the coefficient at the level of ($\alpha \leq 0.05$).

Regarding to the thir hypothesis (H3), results in Table (3) indicate that the value $R = 0.550$, which means that there is a positive correlation relationship with its value (55.0%), which is considered a high between expert systems and the administrative auditing as one of the dimensions of internal audit quality. The value of the coefficient of determination is $R^2 = 0.303$, which means that the expert systems explains 30.3% of the variance in the administrative auditing. The coefficient value of $B = 0.550$; that is, an increased in one unit in the independent variable (expert systems) leads to increasing of 55.0% in the dependent variable (administrative auditing), and with a value of $T = 10.78$ at the level of significance $\text{sig} = 0.000$, which confirms the significance of the coefficient at the level of ($\alpha \leq 0.05$).

By testing the study hypotheses, the three hypotheses were accepted, meaning that there is a statistically significant effect of expert systems on the quality of internal audit, as shown in Table 4. This result was confirmed by Noordin et al. (2022) in his study showed that there is an important contribution to the application of expert systems in increasing the level of audit quality, as well as the study of Saaddit and Erian (2019) which showed that the application of expert systems plays a positive role in improving the internal audit quality, in addition to the study by Radi and Hamid (2017) showed that there is a positive impact of expert systems applications on internal control over the work of banks.

CONCLUSION AND IMPLICATIONS

The application of expert systems can provide automatic analysis of financial data and banking operations, which reduces human error and improves audit accuracy. The application of expert systems also provides better analysis capabilities and smarter decision-making. This can improve the quality of decisions made by the internal audit team at the bank.

The application of expert systems also contributes to enhancing the ability to predict potential risks and detect financial exceptions early. This can improve the overall effectiveness of audits. The use of expert systems can also reduce the time required to conduct audits and thus reduce the overall cost of operations. This can be one of the factors that contribute to improving the quality and efficiency of the audit. In addition, applying expert systems means taking advantage of modern information technologies and technological developments to improve internal audit operations.

Due to the importance of applying expert systems and the benefits derived from them, commercial banks must focus on developing and equipping data analysis systems and reports on the group's performance in order to achieve success, as well as continuing to apply the basic and fundamental dimensions of expert systems in order to develop human capital, as they are a measure of the success of the bank's management and its ability to Survive, grow, expand and gain more market share.

AUTHOR CONTRIBUTIONS

Conceptualization: Dr. Ghassan Abumatar.
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Formal analysis: Dr. Ghassan Abumatar.
Funding acquisition: Dr. Ghassan Abumatar.
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