The Quality of Audit Work Under Expert System

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Abstract:
The research aims to extrapolate the repercussions of the use of expert systems in the work of the external auditor on the quality of audit, as the research problem was that despite the use of these techniques in audit work, there is a problem related to the efficiency and effectiveness of these technological systems used in audit work, the feasibility of their use and the extent of their impact: The quality of the audit process.

The researchers adopted the questionnaire as a tool for collecting study data from a community composed of auditors in auditing offices and companies in Iraq, and the auditors of the Iraqi Federal Financial Supervision Bureau. The number of recovered and valid questionnaires reached (100), or 76% of the total number of questionnaires distributed.

The researchers concluded several results, the most important of which was that the auditor in auditing offices and companies in Iraq, in addition to the auditor of supervisory bodies, are aware of the positive effects of using expert systems in the work of the external auditor on the quality of audit work.

The researchers also concluded many recommendations, the most important of which are: the need for the regulatory authorities, whether in the public sector represented by regulatory bodies, or audit offices and companies, to benefit from these modern technologies, the need for professionals and audit offices to invest in this modern technology, the need to integrate modern technologies related to the accounting profession And auditing the curricula of Iraqi universities, institutes, and colleges.

Keywords: audit quality, expert systems, external audit.
1-Introduction:

The auditor faces many challenges related to the audit process, which are estimating the risk and assessing the internal control structure, planning audit programs, and writing reports, in light of the massive technological acceleration and the entry of information technology and its creation of any real changes in the audit environment and what it changes in various operations such as keeping accounts and proving financial operations, 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.

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

In this study, the researchers present a study of the role of expert systems in the audit process, the areas of their use by audit firms, and their implications for the quality of audit work.

To achieve the goal of the research, the researchers relied on the opinions of a group of external auditors and auditors in the same research units. Based on the following hypotheses:

There is no significant statistically significant difference in the average quality of audit work under expert systems from the hypothetical mean (3).

2- Theoretical background for the quality of audit work

2-1: The concept of the quality of audit work:

There is no clear term that defines the concept of audit work due to the diversity and change of these works and according to the factors and variables that the auditor deems required to achieve the required quality of the financial auditor in the fairness of the statements. Accurate to ensure high quality of work, and thus can determine the nature and timing of audit work (Bahrain Audit Bureau, 2013:49).

And the emergence of many terms that were circulated at the academic and professional levels used to verify the quality of audit work, including (audit quality, quality control, quality assurance, peer review). Despite the multiplicity of concepts related to the quality of auditing, the quality of audit requires a comprehensive concept. It clarifies the main objective expected of it, and it can be said that the quality of the audit is to ensure that the auditor performs his work in a way that achieves the relevant parties for the expected objectives of the audit work. Users of the financial statements (Al-Qaisi, 74: 2015)

2-2: Audit quality elements:

In 1979, the Quality Control Standards Committee (QCSC) of the American Institute of Certified Public Accountants issued Standards Bulletin No. (1), as it identified nine elements of audit quality that audit firms should consider when developing policies and procedures. These elements include the following: (Thomas and Henke, 190: 2010)

1- Independence
2- Assignment of Personnel
3- Supervision
4- Consultation
5- Hiring
6- Professional Development
7- Advancement
8- Acceptance and continuance of customers
9- Inspection


1- Audit fees: When starting negotiations regarding professional services, the auditor can set the fees he deems appropriate, and the fact that one auditor sets fees less than another is not in itself an unethical act. However, the level of costs charged may affect adherence to the Fundamental principles, for example, a threat to personal interest arises on professional competence and due diligence if the fees offered are so low that it may be difficult to perform the audit by the technical and professional standards applicable for that price.

2- Independence of the auditor: The auditor must have a personal personality that makes him not influenced by others and perform his duties despite any pressure on him and despite the conflict between his interests and duties. American (Al-Mutarna, 2009). The auditor's independence and impartiality are the ability of the external auditor to maintain his independence as one of the audit quality measures. The auditor independence is an intellectual condition that requires him to express his opinion through his independence in thought and action. There is no agreement on the auditor's independence, but it is possible to distinguish between two conceptions of independence developed by the Securities Commission (Al-Nasan, 2018: 42-43).

A - The first concept: Mental independence: This mental independence requires that auditors be in a state of mind that allows them to express themselves opinions about the entity they are auditing without pressure due to independence issues a sense of being in the workplace, and under their audits objectively and according to a professional skepticism methodology.

B - The second concept: hypothetical independence: As for the apparent autonomy, it is linked to a third party's perception of the auditor's independence. This third party when the does not believe in the independence of the auditor, although the auditor is considered mentally independent, the third party does not trust the auditor.

3- Professional specialization and due diligence: The rule of professional discipline and due diligence imposes the following obligations on professional accountants:

A- Maintaining professional knowledge and skills at the level required to ensure that clients or employers receive a highly qualified professional service.

b- Efficient, professional service requires the exercise of sound judgment in applying professional knowledge and skills to that service's performance. Professional competence can be divided into two separate stages, the first: obtaining professional competence, and the second: maintaining professional competence.
Experience of audit offices in the industry to which the client belongs: There is no doubt that the experience of audit offices in the industry to which the audited company relates increases the possibility that the audited financial statements are free of material errors, which means that the audio quality is high.

The extent of the auditor's awareness of the importance of achieving quality in the audit process: that is, the auditor's awareness that the audit process is performed in the required manner and with the highest possible quality, as the external users of the financial statements Expect from the audit process outcomes represented in the auditor's report of complete quality because they depend on taking their decisions on this report.

Expert systems and their importance in the field of auditing:

3-1: The concept of expert systems:

Expert systems are interconnected and interacting components that work within a computer program designed to prepare a model based on human experience and be able to justify, solve problems and explain the results obtained. And it is based on the accumulated experience in it to solve a specific problem” (Radi, 2017: 16), while some see it as software and equipment that store knowledge and give results similar to human experience (Stair and Reynolds, 2011: 323).

In the field of accounting control, expert systems can be defined as computer programs that contain the knowledge and experience gained from one or more experts in account control. They are designed to simulate the ways of thinking and decision-making rules of the expert auditor in a particular field so that he can solve a new and non-recurring problem. (Al-Saqqa and Rashid, 2012: 115). Thus, expert systems can be defined as “a computerized information system designed to simulate the ability of human experts to solve the problems faced by the organization, and these problems need a quick solution and have a significant impact on its growth and stability.”

3-2: Functions of expert systems:

Expert systems perform five functions through which they achieve their goal of reaching solutions and results and thus achieving the goals of their users, and these functions are (Abdullah and Abd al-Wahhab, 8:2010):

1. Diagnosing: Expert systems diagnose the problem by using the information to determine the causes of the problem. This is what is focused on in expert systems when control operations, as the problem is diagnosed, such as diagnosing a problem in preparing financial statements.

2. Interpreting: The system describes the inferred positions through the data monitoring. For example, for the previous problem, the system represents a problem in applying a certain principle of generally accepted accounting principles.

3. Predicting: The expert system deduces the results of the situations that have been interpreted and their similarity with previous situations, such as the statement of financial position with the provision for doubtful debts is not calculated, and it will not appear in the statement of financial position with the required book balance.

4. Instructing Instructions: The expert system performs a set of operations within the system through which it can offer the appropriate solution to the problem at hand.
5. Monitoring: The system then (i.e. after solving the problem) compares the evidence and the actual results with what is expected, that is, a picture of the problem is drawn, and its status is stored as a previous reference. From this, it is clear that expert systems perform these functions according to each type of these systems and in any field in which they are used.

3-3: Components of Expert Systems:

   Expert systems consist of integrated and interacting elements, namely: (Al-Dweik and Salem, 27:2013) and (Affana, 2012: 17).

1- Knowledge Base (KB): The knowledge base consists of facts in a particular field, topic or problem, and heuristics that represent the rules that guide the use of knowledge in solving a specific issue, and they are conditional statements that link the limitations of inference or results.

2- Inference Engine (IE): Software for searching the contents of the knowledge base in a precise context and sequence. It mixes and approximates the facts in memory when consulting on an issue, compares the presented issue and transfers it through the dialogue unit, and links it with its stored knowledge bases to solve the problem and choose the appropriate advice, is the basis of expert systems.

3- Explanation Facility (EF): Expert systems are characterized by their ability to interpret thinking and perception. They contain an important part called the Explanation Tool or (interpretation facilities). This tool allows the user or the decision-maker to understand how the expert system arrives at the results.

4- Knowledge Acquisition Facility (KAF): It is a tool that allows the creation, modification, updating, and development of knowledge bases, to provide a convenient and effective means that captures and stores all components of the knowledge base and is the link and interaction between the expert and the knowledge base.

5- User Interface (UI): It facilitates the user to set up and use his expert system because it shows how to solve the problem and the procedures that must be implemented to solve the problem as well as contains the hypotheses and alternatives generated by the system.

6.- Domain expert: A person or group of people with experience and knowledge in the field in expert system’s field.

7- A Knowledge Engineer: A person who has training or experience in the design, development, implementation, and maintenance of the expert system, assists the knowledge engineer in transferring knowledge from the expert system to the knowledge user.

8 - The Knowledge User: A person or group of people who uses knowledge (the user of knowledge previously stored in the expert system) through training on systems and computers. Expert systems are easy for users to understand, even if they are not specialists, because they provide a solution to the problem in an easy language.

3-4: Advantages of using expert systems:

   Expert systems share with traditional information systems some advantages, which take the form of speed, efficiency, and accuracy in giving outputs, but expert systems have some advantages that can outperform other systems. (Mohammed, 203:2020)

   1- Increased output and productivity, increased service quality and process, and enhanced problem-solving process.
2 - Reducing work stops, reducing the time for making decisions, and performing various tasks.
3 - Retain scarce knowledge and experience, freeing human experts from routine problems.
4 - The ability to work in the presence of incomplete or uncertain data.
5 - Training employees to deal with expert systems and their means of clarifying justifications.
6 - Reliability, ease of use, and ability to operate in multiple and remote geographies.
7 - Contribute to strengthening the work of other information systems used by the facility.

3-5: **Using expert systems in auditing:**

There is no doubt that the use of all information systems, whether traditional or advanced, provides many advantages and benefits, the most important of which is achieving efficiency and reducing the time spent on accounts. Perform various tasks. However, using expert systems in auditing accounts can give other benefits in addition to the traditional benefits of any information system. Following is a brief explanation of a number of those benefits that were mentioned in some studies that dealt with this topic: (Al-Dweik and Al-Salem, 2013: 107-108)

1-When using specialized audit systems that improve the ability of non-experts when make difficult or prepared decisions, these systems can also be used by experts to work as an aid to them in making quick decisions that require them to dedicate a period to deal with them.

2-Expert systems increase the efficiency of auditing accounts by reducing costs from several aspects, including reducing the time taken to complete various tasks, reducing the number of individuals required to complete difficult tasks, the possibility of working in one system in several locations, and the presence of an unlimited number of Audit clients. At the same time, the cost of acquiring commercial expert systems is among the acceptable prices.

3- Expert systems can handle a very large amount of data use many problem-solving methods, and employ them to perform various audit tasks, which humans can only do by several people.

4 - Quality of decisions Expert systems give audit firms a competitive advantage over firms that do not use them by providing the best service.

5.Although expert systems are mainly used in the field of real work, they can be used as a training tool for junior training auditors, and as a teaching tool in institutes and universities.

6- The expert systems, including the knowledge base they contain, can publish and distribute the experiences stored in them to all individuals and employees of the audit firm, not to mention their ability to save these experiences over time and retrieve them when needed.

7- Decisions of good systems are distinguished from those of ordinary thinkers in the following stability and objectivity since such systems cannot take into account any of the personal considerations which could affect the impartiality and independence of common auditors and are thus free from fraud, deception, and fraud.
8- Expert systems help expert auditors audit companies' accounts with different activities from their field of expertise, as they reduce the time taken to understand the nature of the activity and the company's work environment.

4-Presenting and analyzing the results of the questionnaire and testing the research hypotheses

Table (1) below shows the demographic information for the items of the research sample, which were included in the questionnaire list:

Table (1): The division of categories to determine the degree of approval

<table>
<thead>
<tr>
<th>Categories</th>
<th>border of upper boundary to degree of approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>The first category strongly disagrees</td>
<td>1 less than 1.80 Too low approval score</td>
</tr>
<tr>
<td>second class not agree</td>
<td>1.8 less than 2.60 Low approval score</td>
</tr>
<tr>
<td>third category neutral</td>
<td>2.6 less than 3.40 Medium approval score</td>
</tr>
<tr>
<td>fourth category OK</td>
<td>3.4 less than 4.20 High degree of approval</td>
</tr>
<tr>
<td>Fifth class Strongly Agree</td>
<td>4.2 5 Very high approval rating</td>
</tr>
</tbody>
</table>

Source: prepared by the two researchers in light of the results of the statistical analysis of the field study data

1. Adoption of the hypothetical average (3) degrees for the theoretical mean, which represents the minimum acceptance of the degree of approval to find the theoretical compromise, is as follows:

\[
\text{standard mean} = \frac{\text{All alternative values}}{5} = \frac{1 + 2 + 3 + 4 + 5}{5} = 3
\]

First: Presentation of the study sample according to personal data:
1. Distribution of the study population according to the educational level variable:

Table (2) Educational level

<table>
<thead>
<tr>
<th>Category</th>
<th>Master's degree or equivalent</th>
<th>PhD or equivalent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: prepared by the two researchers. In light of the results of the statistical analysis of the field study data
It is clear from the table (2) that the percentage of the study community are from the campaign Higher degrees. This means that they can understand the paragraphs of the questionnaire, and answer them with high efficiency, and this enhances the validity and accuracy of the results reached through conducting this study.

3. Distribution of the study population according to the variable number of years of experience:

Table (3) Variable number of years of experience

<table>
<thead>
<tr>
<th>Category</th>
<th>1_5 years</th>
<th>6_10 years</th>
<th>11_15 years</th>
<th>16-20 years</th>
<th>20 Years and over</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>percentage</td>
<td>7</td>
<td>34</td>
<td>8</td>
<td>12</td>
<td>39</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: prepared by the two researchers In light of the results of the statistical analysis of the field study data

It is clear from the Table (3) that 41% of the study sample have experience from one to 10 years, and that 59% of the study sample have experience over 11 years, and this indicates the high level of practical experience of the respondents, which helps that the answer is characterized by relative accuracy, and helps to Validity and accuracy of the results to be reached.

Second: Analysis of the study data:

Arithmetic averages, standard deviations, coefficient of variation and the relative importance of the respondents' perceptions were calculated for each paragraph of the tool, then the results were discussed for each paragraph, and Table No. (4) Illustrates this:

It can be seen from the table next one that the arithmetic averages of the paragraphs of the quality of audit work under expert systems are limited between (4.22 - 3.76) and between two degrees of importance (84.40 - 75.20). The arithmetic mean for the axis as a whole was (3.95), with a standard deviation of (0.66), with a significance percentage (79%), and with a coefficient of difference of (16.71), and at a high degree of agreement.

And Paragraph No. (4 ), which (the expert systems contributed significantly to reducing the effort required to implement the audit process), ranked first with an arithmetic mean of (4.22), and a standard deviation of (0.61), with a coefficient of difference in the degree of approval of the study sample members, which amounted to (14.52), and the relative importance reached For this paragraph (84.40%), at a very high degree of approval.

Paragraphs No. (7, 9) ranked last with an arithmetic average of (3.76) for each of them, and their text was respectively (Auditing using expert systems contributed significantly to reducing cases against the supervisory authority.), (Expert systems contribute to reducing discovery risks. ) with a standard deviation (0.85, 0.68), and with two coefficients of difference in the degree of agreement of the study sample members, which amounted to (22.72-18.18), and the relative importance of each of them reached (75.20%), at a high degree of agreement.
Table (4) Arithmetic averages, standard deviations, coefficient of variation, and relative importance

<table>
<thead>
<tr>
<th>Paragraphs</th>
<th>Paragraphs</th>
<th>Arithmetic mean</th>
<th>standard deviation</th>
<th>Variatioin coefficient</th>
<th>Relative importance</th>
<th>ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I depend significantly on the expert systems in planning the audit process</td>
<td>3.96</td>
<td>0.79</td>
<td>19.96</td>
<td>79.2</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>Expert systems enable me to develop the program that I deem appropriate for the audit process</td>
<td>4.08</td>
<td>0.76</td>
<td>18.66</td>
<td>81.6</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>There is a greater saving in the time taken to complete the audit process by adopting expert systems than in the case of the traditional audit process for the same unit</td>
<td>4.12</td>
<td>0.71</td>
<td>17.35</td>
<td>82.4</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>Expert systems have greatly contributed to reducing the effort required to carry out the audit process</td>
<td>4.22</td>
<td>0.61</td>
<td>14.52</td>
<td>84.4</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>With the adoption of expert systems in auditing, the costs of the audit process have become much lower than before.</td>
<td>4.03</td>
<td>0.85</td>
<td>21</td>
<td>80.6</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>Shrink Errors committed in audit work with my reliance on expert systems in auditing.</td>
<td>3.97</td>
<td>0.73</td>
<td>18.41</td>
<td>79.4</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>The audit using expert systems contributed significantly to reducing the cases filed anti body</td>
<td>3.76</td>
<td>0.85</td>
<td>22.72</td>
<td>75.2</td>
<td>15</td>
</tr>
<tr>
<td>8.</td>
<td>Expert systems contribute to reducing control risks.</td>
<td>3.96</td>
<td>0.65</td>
<td>16.42</td>
<td>79.2</td>
<td>8</td>
</tr>
<tr>
<td>9.</td>
<td>Expert systems contribute to reducing detection risk.</td>
<td>3.76</td>
<td>0.68</td>
<td>18.18</td>
<td>75.2</td>
<td>15</td>
</tr>
<tr>
<td>10.</td>
<td>Usually, the work of new auditors is done using expert systems under the supervision of an expert auditor in that</td>
<td>4.05</td>
<td>0.86</td>
<td>21.17</td>
<td>81</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>Expert systems help new auditors get experience quickly</td>
<td>3.86</td>
<td>0.74</td>
<td>19.14</td>
<td>77.2</td>
<td>13</td>
</tr>
<tr>
<td>12.</td>
<td>Rely on expert systems to solve recurring and routine structural problems.</td>
<td>3.81</td>
<td>0.69</td>
<td>18.16</td>
<td>76.2</td>
<td>14</td>
</tr>
</tbody>
</table>
13. Expert systems help me solve complex problems of defining the audit program. & 3.91 & 0.64 & 16.3 & 78.2 & 10 \\
14. Expert systems help achieve the objectives of the audit process with high quality. & 3.96 & 0.75 & 18.97 & 79.2 & 8 \\
15. Expert systems enable Instructing inexperienced auditors what information should be taken into account in order to arrive at a valid opinion. & 3.95 & 0.77 & 19.5 & 79 & 9 \\
16. Insights associated with auditing based on expert systems are often good and powerful. & 3.87 & 0.61 & 15.86 & 77.4 & 12 \\
17. My reliance on expert systems in the audit process contributed a lot to limiting errors that were occurring during the audit. & 3.91 & 0.64 & 16.3 & 78.2 & 10 \\
18. Use of expert systems Contributed to reducing the problems that were occurring when working within the audit team. & 3.88 & 0.78 & 20.16 & 77.6 & 11 \\
axis as a whole & 3.95 & 0.66 & 16.71 & 79 &  \\

Source: prepared by the two researchers In light of the results of the statistical analysis of the field study data

Hypothesis Test There is no statistically significant difference in the average quality of audit work under expert systems from the hypothetical mean (3).

Table (5)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Arithmetic mean</th>
<th>standard deviation</th>
<th>Test</th>
<th>morale</th>
</tr>
</thead>
<tbody>
<tr>
<td>The quality of audit work under expert systems</td>
<td>3.95</td>
<td>0.52</td>
<td>18,356</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: prepared by the two researchers In light of the results of the statistical analysis of the field study data
The table indicates that the arithmetic means of The quality of audit work under expert systems It reached (3.95), which is higher than the hypothetical mean of this study, which is (3), with a standard deviation of (0.52). The value of (t) calculated (18.356) with a probability value for the axis (0.000) which is less than the level of significance (0.01), so this hypothesis is considered statistically significant, and this means that there is approval by the respondents on this quality of audit work under expert systems. Thus, we accept the alternative hypothesis that says: There is a statistically significant difference in the average quality of audit work under expert systems from the hypothetical mean (3).

Although there are fundamental differences between the opinions of the study sample parties about the role of expert systems in evaluating internal control systems, these differences are not in the direction of the effect, but in its extent or amount, as the average answers of the respondents were greater than (3), which represents the degree of neutrality, which is This means that these differences were in terms of magnitude, not direction.

5-Conclusions and Suggestions
The researchers' conclusions are the following:
1- Expert systems contribute significantly to reduce the effort, time, and costs required to carry out the audit process.
2- The expert systems enable the planning and development of the appropriate program for the audit process, to achieve the objectives of the audit process with high quality.
3- Expert systems can be relied upon to solve recurring and routine structural problems, and complex problems related to defining the audit program.
4- Expert systems help reduce the committed errors, and the problems that were occurring during the audit.

The researchers suggest the following:
1- The need for professionals and audit offices to invest in this modern technology because of its importance in improving performance, efficiency, and audit quality.
2- The necessity to integrate modern technologies related to the accounting and auditing profession into the curricula of Iraqi universities, institutes, and colleges.
3- The regulatory authorities, whether in the public sector represented by the Financial Supervision Bureau, or audit offices and companies, must benefit from these modern technologies.
4- The auditors should take into consideration the need to develop the specialized skills required to practice audit work using emerging technologies.
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جودة أعمال التدقيق في ظل استعمال النظم الخبرية

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