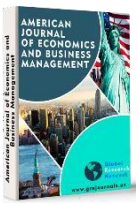

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The Impact of Artificial Intelligence on the Efficiency of System Management in Banks (Statistical Study)

Salih, Sufian Munther [1],

[1] Department of Management Economics Banking, College of Bussiness Economics, AlNahrain University, Baghdad, Iraq

Abstract:

Today's global economy is witnessing increasing competitiveness driven by the rapid development of information technologies, which have become pivotal in various sectors, including regional and urban planning. The tremendous advancement in information systems has propelled institutions, both in the public and private sectors, towards adopting modern technologies to process financial and accounting data in innovative ways characterized by professional and intellectual intelligence. This transformation is crucial for enhancing the sustainability of financial institutions, particularly banks, in a dynamic environment that demands continuous adaptation to cyclical, contingent, and sudden changes.

In the context of regional and urban planning, the efficiency of financial and banking systems has become a fundamental element in supporting sustainable development and effectively financing urban projects. However, traditional methods of bank management are no longer sufficient to keep pace with the accelerating developments in enhancing the efficiency of financial systems, especially concerning the prevention of manipulation, detection of fraud, and management of risks. This situation has necessitated the adoption of advanced methodologies based on Artificial Intelligence (AI), which provides sophisticated technologies that enable the enhancement of the efficiency and reliability of banking system management. This contributes to achieving the requirements of SAR and QIP necessary for highly efficient bank management, which positively reflects on regional and urban planning by improving project financing and directing investments in more accurate and sustainable ways.

Artificial intelligence is considered one of the most important modern technologies that significantly contribute to rapid technological development, thereby enhancing opportunities for innovation and growth in various fields. With the increasing use of AI technologies, it has become vital in improving the efficiency of urban planning, resource management, and enhancing the sustainability of cities, in addition to improving the quality of banking services and increasing the potential and efficiency of banks. Despite the widespread adoption of these technologies and the extensive discussion about their capabilities, they are still surrounded by ambiguity or exaggeration that may raise expectations and lead to unrealistic perceptions. This makes the understanding of AI and its real potential unclear to many decision-makers or executives in the public and private sectors, which calls for conscious strategies that effectively employ these technologies in supporting sustainable regional development.

This research seeks to achieve two main objectives: The first is to clarify the concept of artificial intelligence and its technologies, along with the concept of electronic financial auditing, its procedures, and everything related to bank management. The second objective is to demonstrate the role of artificial intelligence in enhancing the quality of bank management and its reflection on overall performance, with a focus on its impact on regional and urban planning. These technologies contribute to the development of financial systems that support urban projects and enhance the efficiency of regional planning through effective financial resource management and

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the achievement of economic sustainability in urban areas.

The research was based on two main hypotheses:

The use of artificial intelligence techniques helps in achieving quality bank management and performance in the implementation of all banking systems and programs (electronic auditing, deposits, withdrawals, etc.), thereby enhancing the efficiency of regional and urban planning by supporting development projects and improving the investment of financial resources.

The use of artificial intelligence plays a role in achieving quality performance, and the use of digital transformation technologies leads to the activation of continuous auditing. Electronic financial banking auditing in general, supported by artificial intelligence, helps in enhancing transparency and governance within banks, leading to more accurate financial decisions that positively reflect on the sustainability and financing of urban and development projects.

On the practical side, work was done to test the role of artificial intelligence in implementing the efficiency of banking system management and its role in achieving quality performance, through the use of a questionnaire distributed electronically to a number of academic accountants and auditors in a selected group of banks. A total of (54) questionnaires were distributed, and (32) questionnaires were answered and analyzed using the (SPSS 30 - 2024) program.

Based on this, the research was divided into four main axes:

The first axis dealt with the research methodology, while the second axis reviewed the theoretical framework of artificial intelligence and its role in improving the efficiency of banking system management. The third axis focused on the applied aspect, while the research concluded in the fourth axis with conclusions and recommendations aimed at enhancing the integration between artificial intelligence and bank management within the framework of sustainable regional planning.

Keywords: Artificial Intelligence in Bank Management, Sustainable Urban and Regional Planning, Risk Management, Fraud Detection, Urban Project Financing, Quality Performance, Technological Innovation, Financial Decision-Making.

Axis One: Research Methodology

1-1 Research Problem: The increasing volume, diversity, and complexity of banking financial operations, particularly in light of the expansion of institutional activities and the growing pressures on them, have led to reliance on methods and approaches that incorporate financial, accounting, and administrative patterns to achieve high levels of efficiency and performance. To achieve this, these banks need to control their internal systems involved in financial transactions, which necessitates the use of artificial intelligence to implement electronic auditing of financial activities, and thus the adoption of advanced technologies embodied by AI. Accordingly, the research problem has been formulated by posing several questions as follows:

1-Does the use of artificial intelligence help in implementing efficiency (comprehensive auditing of banking systems) in electronic auditing?

2-Does the use of artificial intelligence play a role in achieving quality performance?

1-2 Research Importance: The importance of the research stems from the following:

1-The significant role of using advanced electronic systems in influencing decision-makers and gaining the trust of clients and stakeholders within banks, and the necessity for banks to pay attention to its application to improve performance.

2-Identifying the role of artificial intelligence in implementing efficient electronic financial auditing and its role in achieving quality performance.

1-3 Research Objectives: By presenting the research problem and its importance, this research seeks to achieve the following objectives:

1-To explain the concept of artificial intelligence and its technologies, and the concept and procedures of using electronic systems.

2-To demonstrate the role of artificial intelligence in implementing the use of electronic auditing banking systems and its role in achieving quality performance in bank management.

1-4 Research Hypotheses: Based on the research problem, importance, and objectives, the research is based on two hypotheses:

1-The use of artificial intelligence leads to the implementation of electronic financial auditing.

2-The use of artificial intelligence plays a role in achieving quality performance in bank management.

1-5 Data Collection Methods:

Theoretical Aspect: Sources collected from Arabic and foreign journals, along with theses, dissertations, and modern scientific conferences that addressed the research topic, specifically those related to artificial intelligence and electronic auditing, were utilized.

Practical Aspect: To cover the research hypotheses and its theoretical framework and to reach conclusions, the research relied in its practical aspect on the preparation and design of an electronic questionnaire. This questionnaire was distributed to accountants and auditors working in a selected group of banks, totaling (54) distributed electronic questionnaires. (32) questionnaires were answered, (12) questionnaires were not answered, and (10) were invalid for analysis. The statistical program (SPSS) was used to test the hypotheses and reach conclusions.

Axis Two: Theoretical Framework

2. The Genesis of Artificial Intelligence

Artificial intelligence is considered a modern cognitive science. The beginnings of research related to artificial intelligence date back to the 1940s, with the circulation, spread, and use of computers. In the early 1950s, research interest focused on neural networks. Then, in the 1960s, research activity turned to knowledge-based systems, which continued to be worked on until the end of the 1970s. In the early 1980s, the announcement of the Japanese project, which adopted the fifth generation of computers, marked a significant leap in the field of artificial intelligence research (Al-Samarrai & Al-Shuraida, 2020: 18). Artificial intelligence is a science that works on researching how to make computers perform tasks and activities that humans perform, but in a way that takes less time and effort (Abdul Majeed, 2009: 17).

The use of information technology in managing the business matrices of banks is not a new matter, such as the current use of computers in financial transactions, which has been in use for a long time and continues to this day. However, the introduction of advanced information technologies such as artificial intelligence and the increase in the quantity and volume of data are important factors that have made those responsible for bank management focus on the benefits and gains from their use of information technologies in the process of improving the efficiency and quality of bank performance, which has become a modern trend towards that changing world of auditing (Samahdan & Salmo, 2021).

2.1. Concept of Artificial Intelligence

Artificial Intelligence (AI) is an application on computers that works to build programs capable of studying and applying the repetitive tasks and activities performed by humans (Anbar, 2015: 82). It has also been defined as giving the computer the ability to think

independently and through external data provided to machines, enabling them to learn, interpret, and develop themselves (Isaca, 2018: 4). Furthermore, it has been described as a machine that applies tasks through algorithms as its basis and in an intelligent manner through the machine's ability to receive data and information as inputs in a rapid manner (Aneta, 2019: 148), process these inputs. From this, artificial intelligence is a collection of modern and advanced methods and techniques for programming the accounting system that can be used to develop and grow a system that simulates elements of human intelligence, allowing the user to perform an inferential process based on the laws and facts stored in the computer's memory. This gives the computer the ability to make decisions and solve problems logically, similar to human thinking, but in a more accurate and organized manner.

2.2. Types of Artificial Intelligence

There are several types of artificial intelligence that can be used in banking operations, as follows:

a. Assisted Artificial Intelligence: This refers to machines that perform simple tasks, duties, and operations through the availability of computing power and big data, which helps in the decision-making process. This type of intelligence is characterized by its use in accomplishing main tasks and duties, thus freeing the auditor from performing the more complex and intricate duties (Helmy, 2022: 2).

b. Augmented Artificial Intelligence: This type of intelligence allows institutions and those in charge of banks to do things they cannot do by supporting human decision-making, rather than by simulating autonomous intelligence. Augmented intelligence can make some decisions on its own, but these are not completely independent decisions. Consequently, this type of intelligence poses a risk to management independence if the management is new and inexperienced in dealing with artificial intelligence and its application.

c. Autonomous Artificial Intelligence: This type of intelligence is more advanced and complex than its predecessors. It refers to machines and systems that perform activities and operations on their own, regardless of human intervention, and perform duties and tasks that were unsafe or impossible for management to carry out. This type is considered risky due to its independent operation, which leads to management's inability to see how the system makes decisions. This represents a risk to the efficiency of overall performance execution for banking activities (Uglum, 2021: 10).

Therefore, management must be aware and knowledgeable of these types and how to benefit from each type before using any of them, to avoid any risks that may result from such use.

2.12. Artificial Intelligence Techniques

Artificial intelligence includes several techniques, which are:

1. Neural Network Technology: This is a technology through which the process of integrating cognitive sciences and computing is carried out to perform specific duties and tasks by simulating the work of the brain's nervous system. This means it integrates artificial intelligence and neuroscience to solve many complex tasks (Madahi, 2022: 425). The emergence of this technology is necessary to teach the computer how to think like human thinking. It allows the computer to simulate and imitate the human brain more closely, while still being more accurate, faster, and less biased. A neural network is a computer system designed to categorize and classify data and information in the same way the human brain or thinking does. It can look at images, distinguish their contents, and classify them according to what has been presented. It uses data that the user can access and make a decision (Jarrah, 2019: 45).

2. Machine Learning Technology: This is a set of programming techniques that allow the computer to adapt its behavior to its environment without human intervention. From a technical standpoint, it is defined as an algorithm designed to make decisions independently without prior programming (Al-Ta'i, 2023: 410). This technology relies on a fundamental principle: that the computer receives data and information and learns on its own without any intervention (B., 2019: 1). This technology is promising within the realm of artificial intelligence techniques, and training and knowledge can be implemented very quickly through a large dataset for speech recognition, face recognition and distinction, recognition of the required translation, and recognition of other things. This is in contrast to manual intervention of a programmed software with limited instructions to complete a specific task (Reese, 2017: 2-3).

3. Deep Learning Technology: This is one of the artificial intelligence techniques that involves human intervention in creating a simulation of human thinking and is used to process data and information and assist in making decisions (Taher & Ahmed, 2022: 115). It is also a machine learning method, but it is broader and more fundamental, enabling high-precision use for auditing data and information and then drawing conclusions. With this technology, it has become possible for the computer to detect aspects that need to be noted among a dataset, which are called features or characteristics. The computer automatically acquires features that are difficult to explain logically and linguistically, such as classifying image data through programming. It is necessary for humans to input and define quantities of features (Jarrah, 2019: 46). In addition to the main techniques mentioned, there are other technical tools that can be included within artificial intelligence techniques, including expert systems, training and experience, and technical knowledge.

2.3 Integration of Bank Management with Electronic Auditing for All Banking Business Management Matrices

2.3.1 Concept of Electronic Auditing: Electronic auditing is a process that involves collecting, estimating, and evaluating information to determine whether the use of computers contributes to and protects the institution's assets, verifies the integrity and accuracy of its financial data, and achieves objectives with the required effectiveness and efficient use of resources (Barzan, 2015: 423). It has also been defined as the application of a computer system using information technologies to assist the auditor in planning, control, and documenting the audit process (Abu Aqlah & Othman, 2021: 9). Furthermore, it has been described as the process of auditing through information technology, which helps auditors in various stages of the audit process, including planning, control, risk identification, and risk assessment (Mohsen & Al-Saqqa, 2022: 115). Accordingly, electronic auditing is the process of applying modern computer technology, such as advanced artificial intelligence techniques, which will assist the auditor in performing the assigned audit task in its various stages and completing the audit process with high efficiency, accuracy, and speed that surpasses traditional auditing.

The use of artificial intelligence techniques enhances and significantly supports the electronic auditing process. The work will be characterized by efficiency, accuracy, good organization, and systematic approach through this intelligent machine that can do everything on its own automatically. The Italian philosopher Machiavelli mentioned that there are three types of intelligence: the first is excellent, which understands the details of things on its own; the second is good, which appreciates what others know; and the third is useless, as it does not understand things on its own (Abu Al-Qasim, 2012: 3).

2.3.2 Electronic Auditing Procedures: There are procedures and duties that bank management must follow when implementing electronic auditing, which are as follows:

a. Skills and Competence: Bank management must possess sufficient knowledge in using the systems implemented by the computer in its work to plan the assigned audit process and supervise the workflow. Management must also verify whether a set of specialized skills in these technical systems is required during the audit process. The objectives of following and using these skills are as follows (Barzan, 2015: 426):

- To understand adequately the accounting system and the control system affected by the use of technologies and systems on the computer.
- To determine the impact of this environment on risks and on overall risk assessments.
- To design and conduct appropriate control tests and substantive key procedures.

b. Planning the Audit Process: This is done through understanding the accounting system and the internal control system, which enables bank management to plan the assigned audit process and develop and envision an effective approach to its completion. When planning a part of the audit task affected by the computer information systems used, (bank management) must understand the complexity and importance of the activities and operations of those computer systems (Omoteso, 2012: 4).

c. Risk Assessment: This involves identifying the risk factors that impede the achievement of the audit process objectives. It is a crucial stage of the initial key stages in evaluating, assessing, and studying the internal control system, which will determine and establish the foundations and procedures that will be followed to correct and address any expected threats or negative impacts (Yassin et al., 2020: 240). Bank management should assess the inherent risks and control risks in the operation and environment of computer systems and technologies, and the overall impact and the impact on a specific account in the event of potentially incorrect key data or information (Al-Matarna, 2013: 230).

Thus, the electronic auditing followed by bank management using artificial intelligence techniques, including computer programs and systems, electronic data, and information, is considered a set of procedures that fall within the audit process to record and process incoming data and information related to audit significance within the institution's information system in general and for banks in particular.

2.3.3 Role of Artificial Intelligence in Implementing Electronic Auditing and Achieving Quality Performance for the Auditor: The use of artificial intelligence may help reduce the risks of the audit process that revolve around the failure to detect major and material errors in financial data and information or in the internal system due to the auditor's examination of only a specific sample of data and information. Thus, artificial intelligence techniques have emerged as a necessity due to their importance and their great ability to fully examine the financial data and information subject to audit. This helps auditors and enables them to identify suspicious and unusual transactions. In the presence of artificial intelligence techniques and their use in the institution, they will help in applying electronic auditing through speed in making decisions by providing the required data and information, shortening the completion of the audit process, and assisting in examining and evaluating data and information with high accuracy and a low margin of error during the application of the audit process. Thus, electronic auditing is applied using artificial intelligence.

Artificial intelligence will also assist bank management in performing its tasks of examination and evaluation using advanced programs and systems contained in artificial intelligence techniques to detect any potential violations or errors to be recorded in its report. This leads to increased audit efficiency in all aspects of bank transactions. These advanced technologies will qualify it to reach the highest levels of performance with less effort and less time spent, without spending long hours auditing financial data and information. Artificial intelligence techniques perform the audit process in an ideal and

standard time, which will help shorten the completion time for the bank, thereby achieving quality professional performance. (Tikrit Journal of Administrative and Economic Sciences, Vol. 19, No. Special Issue, Part (1): 159-182)

Axis Three: The Applied Framework

3. The Practical Aspect: The practical aspect is divided into:

3.1 Research Population:

To achieve the main objective of the research — namely, *"The Impact of Artificial Intelligence on the Efficiency of System Management in Banks"* and its role in achieving performance quality — the research population was selected to be the Islamic Bank, Al-Mansour Branch. This included accountants, auditors, and heads of departments and divisions.

A total of 54 electronic questionnaires were distributed. Of these, 12 questionnaires were not returned, and 10 questionnaires were deemed invalid for analysis. Thus, the number of valid questionnaires suitable for statistical analysis was 32, as shown in Table (1).

No.	Percentage	No. of questionnaires	Status
1	%22	12	not returned
2	%19	10	invalid
3	%59	32	returned
Total	%100	54	Total number of distributed questionnaires

Table (1): Distributed Forms, Source: Prepared by the Researcher.

3.2 Description of the Research Sample:

The description of the sample represents the first part of the distributed electronic questionnaire, which outlines the key personal information of the respondents. The information is presented in Table (2).

Scale	Percentage (%)	No.	Subcategory
Educational Qualification	65.6	21	Bachelor's Degree
	9.4	3	Higher Diploma
	6.3	2	Master's Degree
	12.5	4	Doctorate
Field of Specialization	93.8	30	Accounting
	6.3	2	Business Administration
	0	0	Financial Sciences
	0	0	Audit and Control
Years of Experience	15.6	5	Less than 5 years
	25.0	8	6-10 years
	37.5	12	11-15 years
	15.6	5	16-20 years
	6.3	2	21 years and above
Workshops and Training	9.4	3	None

Courses (Accounting)			
	25.0	8	One course
	15.6	5	Two courses
	50.0	16	Three or more courses
Workshops and Training Courses (Audit)	12.5	4	None
	40.6	13	One course
	15.6	5	Two courses
	31.3	10	Three or more courses

Table (2): Description of the Research Sample Based on Respondents' Personal Information

None		**One course**		**Two courses**		**Three or more courses**	
Number(s)	%	Number(s)	%	Number(s)	%	Number(s)	%
6	18.8%	8	25.0%	8	25.0%	10	%31.3

Table (3): Workshops and Training Courses of Respondents in Computer and Internet Programs, Source: Prepared by the Researcher (Based on Questionnaire Results)

3.3 Scales for Describing the Questionnaire Questions

Using artificial intelligence techniques, there will be an advanced electronic banking management and auditing information system that will help in making the right decisions.		
Answers	Frequency	Percentage
Neutral	2	6.3%
Agree	19	59.4%
Strongly Agree	11	34.4%
Total	32	100.0%

Table (4): Scale for Describing the First Question

From Table (4), it is clear that artificial intelligence techniques will help banks in creating a comprehensive, advanced electronic administrative and auditing system based on modern informational technologies, which in turn supports the decision-making process.

The practice of electronic auditing using artificial intelligence and its actual implementation leads to overcoming shortcomings.		
Answers	Frequency	Percentage
Disagree	1	3.1%
Neutral	1	3.1%
Agree	19	59.4%
Strongly Agree	11	34.4%
Total	32	100.0%

Table (5): Scale for Describing the Second Question

From Table (5), it is evident that the use of artificial intelligence in practicing electronic management and auditing in banks will help overcome all traditional shortcomings when applying the electronic auditing program for financial transactions.

The use of artificial intelligence through electronic auditing contributes to the development of internal control systems and reduces risks.		
Answers	Frequency	Percentage
Disagree	1	3.1%
Neutral	3	9.4%
Agree	16	50.0%
Strongly Agree	12	37.5%
Total	32	100.0%

Table (6): Scale for Describing the Third Question

From Table (6), it is clear that electronic auditing using artificial intelligence will contribute to the development of the internal control system and risk reduction by evaluating, estimating, and studying the internal control system. This will identify and establish the foundations and procedures to be followed in order to correct and address any expected threats, risks, or negative impacts.

Answers	**Frequency**	**Percentage**
Disagree	1	3.1
Neutral	4	12.5
Agree	18	56.3
Strongly Agree	9	28.1
Total	32	100.0

Table (7): Scale for Describing the Fourth Question: The knowledge and awareness of the auditor regarding artificial intelligence affect their level of competence when using the techniques.

From Table (7), it is clear that the auditor's possession of sufficient awareness and knowledge in using artificial intelligence systems and programs, which are implemented by computers in their work for planning the assigned auditing process and supervising the workflow, will help enhance their level of competence.

Answers	**Frequency**	**Percentage**
Disagree	1	3.1
Neutral	6	18.8
Agree	19	59.4
Strongly Agree	6	18.8
Total	32	100.0

Table (8): Scale for Describing the Fifth Question: The use of artificial intelligence greatly improves the accuracy of electronic auditing procedures.

From Table (8), it is clear that the use of artificial intelligence techniques, including computer programs, systems, and electronic data and information utilized by the bank's management, is considered part of the auditing process. This is done to record and process relevant data and information related to audit significance within the bank's information system.

Answers	**Frequency**	**Percentage**
Neutral	2	6.3
Agree	21	65.6
Strongly Agree	9	28.1
Total	32	100.0

Table (9): Scale for Describing the Sixth Question: The application of electronic auditing using artificial intelligence helps the bank's management by storing a vast amount of data and information and facilitates its retrieval and organization.

From Table (9), it is clear that the importance of artificial intelligence techniques has emerged as a necessity due to their great and high capacity to conduct a comprehensive examination of the vast amount of financial data and information stored and subject to electronic auditing, which is followed by bank management.

Answers	Frequency	Percentage
Disagree	1	3.1
Neutral	2	6.3
Agree	18	56.3
Strongly Agree	11	34.4
Total	32	100.0

Table (10): Scale for Describing the Seventh Question: The use of artificial intelligence helps reduce the risks of electronic auditing.

From Table (10), it is clear that the use of artificial intelligence helps reduce the risks of the electronic auditing process for financial matters followed by the bank's management. These risks revolve around the failure to detect major and essential errors in financial data and information or within the internal system due to the auditor's reliance on examining only a limited sample of data and information.

Answers	Frequency	Percentage
Neutral	3	9.4
Agree	17	53.1
Strongly Agree	12	37.5
Total	32	100.0

Table (11): Scale for Describing the Eighth Question: The application of electronic auditing helps the bank's management complete the auditing process with high efficiency, accuracy, and speed, surpassing traditional auditing.

From Table (11), it is clear that artificial intelligence techniques assist the bank's management in performing the assigned auditing task in its various stages: the planning phase, the control and monitoring phase, the identification of potential risks phase, and completing the auditing process with high efficiency, accuracy, and speed, thereby surpassing traditional auditing.

Answers	Frequency	Percentage
Neutral	1	3.1
Agree	14	43.8
Strongly Agree	17	53.1
Total	32	100.0

Table (12): Scale for Describing the Ninth Question: Enabling the bank's management to use computer-executed systems in their work for planning the auditing process will contribute to the implementation of electronic auditing.

From Table (12), it is clear that when planning a part of the auditing task affected by the work of the information systems used by the computer, the bank's management must understand the complexity and importance of the activities and operations of those computer systems. Additionally, the information must be available to be used in the auditing process, which contributes to the implementation of electronic auditing.

Answers	Frequency	Percentage
Disagree	2	6.3
Neutral	3	9.4
Agree	18	56.3
Strongly Agree	9	28.1

Total	32	100.0

Table (13): Scale for Describing the Tenth Question: The enhancement and support of artificial intelligence techniques for the electronic auditing process will result in work characterized by efficiency, accuracy, organization, and consistency.

From Table (13), it is clear that the use of artificial intelligence techniques, when enhanced within the efficient management of the bank and the electronic auditing process, serves as an important support. The work will be characterized by efficiency, accuracy, organization, and consistency through this intelligent machine, which is capable of performing everything autonomously.

Answers	**Frequency**	**Percentage**
Disagree	2	6.3
Neutral	7	21.9
Agree	13	40.6
Strongly Agree	10	31.3
Total	32	100.0

Table (14): Scale for Describing the Eleventh Question: Artificial intelligence poses a threat to data security in banks.

From Table (14), it is evident that the use of artificial intelligence and machine learning in banks does not necessarily indicate that the services and operations are as advanced as required. In some cases, there is incorrect usage in one way or another. Of course, there are also instances of proper use, adherence to correct principles and guidelines, accurate data interpretation and utilization, and proper algorithm execution — but not in all cases. This is especially relevant when it comes to information security procedures within the bank, which employ and implement artificial intelligence technologies and other modern IT solutions.

Answers	**Frequency**	**Percentage**
Disagree	1	3.1
Neutral	3	9.4
Agree	16	50.0
Strongly Agree	12	37.5
Total	32	100.0

Table (15): Scale for Describing the Twelfth Question: I have the ability and skill to use artificial intelligence technologies, computer systems, and auditing programs.

From Table (15), it is clear that the ability and skill of bank management in using advanced programs and systems provided by artificial intelligence technologies assist in carrying out their tasks—such as inspection, evaluation, and detection of any potential breaches or errors—to be documented in their reports.

Answers	**Frequency**	**Percentage**
Disagree	1	3.1
Neutral	1	3.1
Agree	20	62.5
Strongly Agree	10	31.3
Total	32	100.0

Table (16): Scale for Describing the Thirteenth Question: The use of artificial intelligence technologies enables me to complete the auditing tasks assigned to me in a timely manner.

From Table (16), it is evident that advanced artificial intelligence technologies will enable bank management to achieve the highest levels of performance while exerting less effort and spending less time. This eliminates the need to spend long hours auditing financial

data and information, as AI technologies can carry out the auditing process in an ideal and efficient timeframe.

Answers	Frequency	Percentage
Disagree	2	6.3
Neutral	5	15.6
Agree	19	59.4
Strongly Agree	6	18.8
Total	32	100.0

Table (17): Scale for Describing the Fourteenth Question: The use of artificial intelligence technologies allows me to possess the auditing efficiency and skills necessary to complete my work with high accuracy.

From Table (17), it is clear that with the presence and use of artificial intelligence technologies in banks, they will support the implementation of electronic auditing by enabling faster decision-making through the availability of required data and information, streamlining the completion of the financial audit process, and assisting in the examination and evaluation of data and information with high accuracy and minimal error margin during the application of electronic auditing for all banking financial operations.

Answers	Frequency	Percentage
Disagree	1	3.1
Neutral	5	15.6
Agree	15	46.9
Strongly Agree	11	34.4
Total	32	100.0

Table (18): Scale for Describing the Fifteenth Question: I inform senior management about the auditing programs used in the auditing processes at the bank.

From Table (18), it is clear that the financial auditor, who uses artificial intelligence techniques and is a part of the bank's workforce, is connected to the senior management. The auditor maintains continuous and ongoing communication with them, keeping them updated on the progress of the auditing process and the advanced programs and systems used. This allows for feedback and guidance that supports the electronic auditing process (feedback loop between the bank's management and employees).

Answers	Frequency	Percentage
Disagree	4	12.5
Neutral	4	12.5
Agree	13	40.6
Strongly Agree	11	34.4
Total	32	100.0

Table (19): Scale for Describing the Sixteenth Question: The use of artificial intelligence technologies contributes to the development of auditing programs used in auditing processes to serve the operational requirements of banks.

From Table (19), it is clear that artificial intelligence techniques assist in developing the auditing process by creating an advanced electronic auditing program based on modern technologies, systems, and information algorithms. This is achieved through the high capacity to conduct a comprehensive examination of financial data and information subject to auditing, thus helping auditors and supporting the decision-making process.

Answers	Frequency	Percentage
Disagree	1	3.1
Neutral	2	6.3
Agree	5	15.6
Strongly Agree	17	53.1
Total	7	21.9
Disagree	32	100.0

Table (20): Scale for Describing the Seventeenth Question: I work with a spirit of teamwork and cooperation with my colleagues, helping them perform their responsibilities with high effectiveness.

From Table (20), to complete and accomplish the management and auditing process as required, with high speed and accuracy, one of the key factors for success is the cooperation among employees and helping each other with a team spirit.

Answers	Frequency	Percentage
Disagree	2	6.3
Neutral	5	15.6
Agree	16	50.0
Strongly Agree	9	28.1
Total	32	100.0

Table (21): Scale for Describing the Eighteenth Question: I ensure continuous verification of the planned auditing objectives.

From Table (21), it is clear that assisting bank management in achieving the objectives of the electronic auditing process for all financial operations within the bank is done by implementing its planned and outlined goals. This is achieved by following a systematic approach in evaluating, supporting, and improving the efficiency and effectiveness of risk management, as well as governance and control.

Answers	Frequency	Percentage
Disagree	3	9.4
Neutral	2	6.3
Agree	20	62.5
Strongly Agree	7	21.9
Total	32	100.0

Table (22): Scale for Describing the Nineteenth Question: I ensure the application of professional conduct rules and auditing standards within the organization.

It is clear from Table (22) that the management's commitment to professional conduct rules and international auditing standards issued by professional and international organizations, including the use of modern technologies, helps achieve high-quality professional performance for the bank.

Answers	Frequency	Percentage
Disagree	5	15.6
Neutral	3	9.4
Agree	18	56.3
Strongly Agree	6	18.8
Total	32	100.0

Table (23): Scale for Describing the Twentieth Question: The use of artificial intelligence leads to an increase in the efficiency of bank management and electronic auditing in performing tasks and their quality.

From Table (23), the use of advanced programs and systems containing artificial intelligence techniques by the auditor helps in detecting any potential breaches or errors to be recorded in the report, which leads to an increase in the auditor's efficiency in performing their tasks and duties.

Answers	Frequency	Percentage
Disagree	5	15.6
Neutral	5	15.6
Agree	16	50.0
Strongly Agree	6	18.8
Total	32	100.0

Table (24): Scale for Describing the Twenty-First Question: In the presence of artificial intelligence techniques, the auditing reports I present to the bank's senior management are characterized by accuracy, objectivity, and clarity.

From Table (24), the use of artificial intelligence techniques in the electronic auditing process helps management quickly detect significant errors in the bank's system and document those errors in the report presented to senior management, which is characterized by clarity and accuracy.

Answers	Frequency	Percentage
Disagree	2	6.3
Neutral	2	6.3
Agree	22	68.8
Strongly Agree	6	18.8
Total	32	100.0

Table (25): Scale for Describing the Twenty-Second Question: The bank's management ensures the training and provision of advanced educational opportunities for employees in using artificial intelligence technologies.

From Table (25), it is clear that in order for employees in banks to possess the necessary knowledge and skills to use the computer-based programs and systems in their work—specifically for planning the auditing process they are assigned to and overseeing the workflow—management must provide training courses and workshops to learn how to use modern technologies.

3.4 Friedman Test: Ranking the Importance Levels Based on the Mean Rank Value

Mean Rank	Sentence
14.19	Enhancing and supporting artificial intelligence technologies for the electronic auditing process will result in work that is characterized by efficiency, accuracy, good organization, and orderliness.
12.28	I have the ability and skill to use artificial intelligence technologies, computers, and auditing software.
12.13	Practicing banking management and electronic auditing using artificial intelligence and its actual application helps overcome shortcomings.
12.06	By using artificial intelligence technologies, there will be an advanced electronic information auditing system in the banking sector that aids in making the right decisions.
12.06	Applying electronic auditing using artificial intelligence helps banking management by storing vast amounts of data and information and facilitating their retrieval and organization.
11.91	The use of artificial intelligence technologies enables me to complete the tasks assigned by banking management in a timely manner.
11.89	The knowledge and awareness of management regarding artificial intelligence affects the level of their efficiency in using these technologies.

Mean Rank	Sentence
11.69	The use of artificial intelligence through electronic banking auditing contributes to the development of internal control systems and the reduction of risks.
11.28	I brief senior management on the auditing programs used in the bank's auditing processes.
11.06	Enabling bank management to use computer-executed systems in their work for audit planning will contribute to the implementation of financial electronic auditing in general.
10.75	Artificial intelligence poses a threat to data security in banks.
10.70	I make sure to continuously verify that the planned audit objectives are being achieved.
10.63	The application of electronic auditing helps carry out the financial audit process in the bank with high efficiency, accuracy, and speed—surpassing traditional auditing.
10.55	Bank management is keen on providing training and advanced learning opportunities for employees to use artificial intelligence technologies within the banks.
10.27	The use of artificial intelligence helps reduce the risks of electronic auditing.
10.13	The use of AI technologies contributes to the development of auditing programs used in audit operations to meet the work requirements in banks.
10.90	I make sure to apply professional conduct rules and auditing standards in banks.
10.08	The use of AI technologies enables me to possess the auditing efficiency and skills necessary to carry out my work with high accuracy.
9.70	The use of artificial intelligence greatly improves the accuracy of electronic auditing procedures.
9.39	I work with a spirit of teamwork and cooperation with my colleagues and assist them in fulfilling their responsibilities effectively.
9.33	The use of artificial intelligence increases the efficiency of internal auditors in performing their tasks.
8.94	With the use of artificial intelligence technologies, the audit reports I present to senior management are characterized by accuracy, objectivity, and clarity.

Table No. (26): Rank Importance Ordering Table

Based on the first research hypothesis, the use of artificial intelligence leads to the implementation of electronic financial auditing and the execution of all banking systems and programs with high quality (including electronic auditing, deposits, withdrawals, etc.). The data collected from respondents' answers indicates the need to use an appropriate test—namely, the **Friedman Test**, a non-parametric test. By using the **Mean Rank**, the highest level of importance is attributed to:

"Enhancing and supporting artificial intelligence technologies for the general electronic financial auditing process in the bank, as the work will be characterized by efficiency, accuracy, good organization, and orderliness."

On the other hand, the lowest level of importance is attributed to:

"With the use of artificial intelligence technologies, the audit reports I present to senior management are characterized by accuracy, objectivity, and clarity."

The rest of the dimensions fall in between the first and last in terms of importance.

As shown in the **Rank Importance Ordering Table (Table No. 26)** and based on the mean rank values, in order to determine whether there are significant differences among the studied dimensions, the **Friedman Test** was applied. The result, which was **43.643** at a **significance level of 0.05**, indicates the presence of highly significant differences, as confirmed by comparison with the tabulated value.

Test Statistics

N	
32	Friedman Test
20	d.f
0.05	Sig.

Table No. (27)

3.5 Regression (Model Summary)

Model	r	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
All variables	0.438	0.192	0.002	0.58167	0.192	0.990	6	25	0.453
After removing the variables with weak effect	0.324	0.105	0.075	0.55877	-0.021-	0.696	1	29	0.411

Table No. (28)

As for the **regression** in the second hypothesis, the use of artificial intelligence plays a role in achieving performance quality in bank management, where the use of digital transformation technologies activates continuous auditing. This hypothesis was addressed through **regression analysis**, which involves dealing with the variable of electronic auditing. As for the other dimensions previously mentioned, which are considered independent variables, **stepwise regression** was used to identify the effect of all variables and only those with statistically significant effects. Additionally, through the first model under the title **All Variables**, the correlation coefficient reached **0.438**, and the coefficient of determination was **0.192**.

3.6 ANOVA Test

ANOVA table

	Model	Sum of Squares	df	Mean Square	F	Sig.
All variables	Regression	2.010	6	0.335	0.990	0.453b
	Residual	8.458	25	0.338		
	Total	10.469	31			
After removing the variables with weak effect	Regression	1.102	1	1.102	3.530	0.070a
	Residual	9.367	30	0.312		
	Total	10.469	31			

Table No. (29)

It is evident from the **ANOVA test** that the **F value** was **0.990**, and at the **significance level**, it was **0.453**, which is a non-significant value.

6.3. (Coefficients)

Model	Variables	Non-standard coefficients	Standardized coefficients	Other statistics
		B	Standard Error	Beta
1	**(Constant)**	5.715	0.940	
	Educational Qualification	0.136	0.142	0.228
	Specialization	-0.893	0.450	-0.378
	Number of years of experience in the field	-0.159	0.120	-0.306
	Number of training courses attended by the respondent	0.158	0.141	0.293
	In the field of auditing	-0.004	0.138	-0.007
	In the field of computers and the internet	-0.053	0.142	-0.101
2	**(Constant)**	5.767	0.797	
	Specialization	-0.767	0.408	-0.324

Table No. (30)

The independent coefficients for the variables (Coefficients), including qualifications, years of experience, and the training courses for both computers and auditing, are fixed at their values in the **Coefficients** table. Some of these had a significant effect, while others did not.

As for the second model, which involves removing variables with non-significant effects, the specialization variable remained solid. The significant effects of the other variables were observed. The correlation coefficient for this model reached **0.324**, and the coefficient of determination was **0.105**. The **F value** in the **ANOVA table** was **3.530**, which was significant at the **0.70** level. Thus, we notice that, except for the specialization variable, all other variables had a weak effect.

3.7 Fourth Axis: Conclusions and Recommendations (Through Strengthening the Integration of Artificial Intelligence and Banking Management within the Framework of Sustainable Regional Planning)

3.7.1 Conclusions

1. The Role of Artificial Intelligence in Developing Banking Systems: Artificial intelligence is a set of advanced methods and techniques used to program accounting systems in banks, enabling the development of intelligent systems that mimic human abilities in reasoning and decision-making. By analyzing financial data and deriving solutions based on stored rules and standards, these systems can improve the accuracy and efficiency of banking operations, thereby enhancing their integration with sustainable regional planning by supporting economic and development projects.

2. Electronic Auditing in Banks and Its Role in Regional Planning: Electronic auditing is an essential part of modern banking management, relying on artificial intelligence techniques in all stages of auditing, starting from planning, through monitoring, risk assessment, and up to corrective actions. This development contributes to improving banking governance, positively impacting the quality of financial resource management in urban and regional projects, and ensuring efficient investment in infrastructure and economic development.

3. Banking Performance Quality and Its Reflection on Regional Planning: The quality of banking performance is measured by the bank's adherence to international auditing standards, ensuring the accuracy and transparency of financial processes. Furthermore,

detecting potential errors and breaches in the accounting system enhances trust in banking institutions, a crucial factor in supporting large projects and sustainable regional planning by providing a stable financial environment that attracts investments.

4. The Importance of Artificial Intelligence in Achieving Banking Efficiency: Artificial intelligence significantly contributes to the efficient application of electronic financial auditing programs, making financial and administrative auditing processes more accurate and effective. Additionally, improving the quality of banking services and increasing security and trust in financial operations enhances banks' ability to support urban initiatives, especially when appropriate staff training is provided on using these technologies.

5. Enhancing Banking Management Efficiency through Artificial Intelligence Technologies: Relying on intelligent systems and software helps banks improve their ability to detect financial violations and prepare accurate reports, which improves administrative performance and strengthens the role of banks in supporting regional and urban projects by providing more advanced and sustainable financial solutions.

6. Research Results on the Impact of Artificial Intelligence on Banking Management: The research findings revealed that artificial intelligence techniques contribute to accelerating the implementation of banking management plans and effectively applying electronic auditing programs. This feature ranked first with a relative importance of 14.19. Providing skills and capabilities to employees ranked second with 12.28, while these techniques helped overcome deficiencies in banking management, placing them third with 12.13. Together, these factors enhance the role of banks in financing and organizing regional and urban projects effectively, ensuring sustainable development according to the best financial and planning practices.

3.7.2 Recommendations

1. **The Role of Artificial Intelligence in Developing Banking Systems and Supporting Regional Planning:**

Artificial intelligence is an integrated system of advanced methods and techniques that contributes to programming accounting and management systems within banks. It enables the development of intelligent solutions that mimic human abilities in analysis, reasoning, and decision-making. By processing financial data according to precise standards, artificial intelligence helps improve the efficiency of banking operations, which enhances the role of banks in supporting economic and developmental projects. It enables them to perform a strategic role in sustainable regional planning by providing accurate and advanced financial tools.

2. **Electronic Auditing as a Pillar in Banking Management and Urban Planning:** Electronic auditing is a key element in the modern development of banking management, relying on artificial intelligence technologies throughout all stages, from planning and evaluation to monitoring, risk management, and taking necessary corrective actions. This modern approach ensures a high level of transparency and efficiency in the banking system, which contributes to improving the management of financial resources allocated to urban and regional projects. It also enhances the ability of governments and the private sector to fund infrastructure and development projects sustainably.

3. **The Quality of Banking Performance and Its Role in Achieving Stability in Regional Planning:**

Adherence to international auditing standards is a key factor in achieving banking performance quality, as these standards ensure the accuracy of financial processes, detect potential violations, and enhance the reliability of banking systems. By developing auditing mechanisms supported by artificial intelligence, a more stable financial environment can be achieved, which supports the implementation of major regional

projects and contributes to economic sustainability by efficiently managing financial resources.

4. **Artificial Intelligence as a Tool to Enhance Financial and Administrative Auditing Efficiency:**
Artificial intelligence directly contributes to improving the accuracy and effectiveness of financial and administrative auditing processes within banks. This leads to the development of more efficient procedures in financial data analysis, reducing human errors, and enhancing security and trust in the banking system. This, in turn, helps improve the sustainability of urban and regional projects by providing reliable funding sources and reducing financial risks that may affect regional planning processes.

5. **Improving Banking Management Efficiency through Smart Technologies:** By relying on artificial intelligence technologies, banks enhance their ability to detect financial violations and produce accurate and objective reports, improving administrative performance. This efficiency positively reflects on regional planning, as it allows financial institutions to offer more sustainable financing solutions and assists in developing financial policies that align with long-term developmental goals.

6. **Research Findings on the Impact of Artificial Intelligence on Banking Performance and Regional Planning:**

The research findings showed that artificial intelligence technologies significantly contribute to accelerating the implementation of banking management plans and the efficient application of electronic auditing programs. This benefit ranked first with a relative importance of **14.19**. Furthermore, improving the skills and capabilities of employees ranked second with **12.28**, while these technologies helped overcome administrative deficiencies by **12.13**. These results confirm that the effective integration of artificial intelligence with banking management contributes to financial stability and enhances the banks' ability to support and finance regional and urban projects, ensuring sustainable development according to the best financial and planning practices.

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