

The Impact of Digital Transformation on the Quality Auditing: A Survey Study in the Iraqi Environment

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Abstract: This study aimed to explore the impact of digital transformation on the level of audit quality from the perspective of a sample of academics within the Iraqi context. Digital transformation was represented by four key technologies: cloud computing, big data, blockchain, and artificial intelligence, while audit quality was reflected through the practices and procedures adopted by auditors. The researcher targeted a sample of academics at the University of Tikrit due to the knowledge constraints posed by the novelty of the digital transformation topic and its associated technologies. A questionnaire was designed to collect primary data from the sample, which included postgraduate students and faculty members specializing in accounting. A total of 53 valid questionnaires were retrieved and analyzed. To achieve the study's objectives and test its hypotheses, the analytical descriptive method was employed. The findings revealed several key conclusions, most notably a significant positive impact of digital transformation on enhancing audit quality. The adoption of digital transformation technologies by audited firms serves as a catalyst for improving audit processes and auditor competencies in line with the evolving requirements of modern auditing practices.

Key words: Digital Transformation, Audit Quality, Cloud Computing, Big Data, Blockchain, Artificial Intelligence.



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Introduction

In recent years, digital transformation has garnered unprecedented international and local attention due to the remarkable advancements brought about by the technological revolution across various sectors. The rapid development of smart devices, machinery, and systems has introduced innovative solutions that reduce time, lower costs, and enhance operational efficiency. These advancements have driven profound and unprecedented changes in the economy and labor market,

leading to increased competition among organizations striving to keep pace with economic complexities, technological progress, and business risks.

Internet-based services and related information technologies such as big data, data analytics, artificial intelligence, cloud computing, and blockchain are rapidly transforming the traditional economy into a digital economy. These technologies offer immense business potential for seizing new opportunities and achieving higher revenue growth rates in line with stakeholder objectives. Moreover, digital transformation contributes to the creation and development of new and improved business models that add value for all stakeholders.

In parallel, auditing has recently gained significant attention due to the expanding size and scope of organizational activities. External auditing has become a fundamental mechanism of corporate governance and a vital tool for ensuring the reliability of information systems. It enhances the auditor's ability to detect irregularities and errors in financial statements and to assess whether the figures and disclosures presented in financial reports reliably reflect the company's true financial position and operational performance. In light of intense competition and the drive for excellence, the focus has shifted to audit quality as a means to adapt to the changes driven by digital transformation.

Accordingly, this study aims to examine the impact of digital transformation on audit quality within the Iraqi context.

Section One: General Framework of the Study

Research Problem

Based on the aforementioned context, the research problem can be articulated through the following questions:

1. Is there a statistically significant correlation between digital transformation, in general and across all its dimensions, and audit quality from the perspective of the study sample?
2. Does digital transformation, in general and across all its dimensions, have a significant impact on audit quality from the perspective of the study sample?

Research Significance

The significance of this study stems from the novelty of its subject matter. In addition, the topic suffers from a scarcity of academic research that addresses the combined impact of the variables examined in this study on audit quality, despite its importance. It is anticipated that this topic will attract growing interest in future research efforts.

Research Objectives

The main objective of the study is to examine and analyze the implications of digital transformation mechanisms as one of the innovations in information technology and their impact on the various factors influencing the auditing process. The study also aims to explore the future outlook for digital transformation within auditing practices, while identifying the challenges and difficulties that may hinder the implementation of digital transformation mechanisms in audit procedures. This overarching goal is supported by the following sub-objectives:

1. To identify the mechanisms of digital transformation, their importance, and their role in enhancing audit procedures.
2. To assess the effects of digital transformation mechanisms, as a foundation for IT innovations, on the factors influencing audit process management.

Research Hypotheses

To address the research questions which represent the core problem the researcher aims to solve the following hypotheses have been formulated:

(H1) First Main Hypothesis: There is a statistically significant correlation between digital transformation overall and across all its dimensions and audit quality from the perspective of the study sample.

(H2) Second Main Hypothesis: There is a statistically significant impact of digital transformation overall and across all its dimensions on audit quality from the perspective of the study sample.

Research Boundaries

The study includes the following boundaries:

1. Spatial Boundaries: The research was conducted at the University of Tikrit.
2. Temporal Boundaries: The study covers a one-week period from March 24, 2024, to March 31, 2024.
3. Human Boundaries: The sample consisted of academics in the accounting field at the University of Tikrit, including postgraduate students (Master's and Ph.D. candidates) and faculty members.
4. Subject Boundaries: The research focused on the topic of digital transformation using four dimensions (cloud computing, big data, blockchain, and artificial intelligence), and its relationship with audit quality.

Research Methodology and Model

The researcher adopted a two-source data approach: secondary data from relevant accounting literature, and primary data collected through a questionnaire. The descriptive-analytical method was employed to achieve the research objectives and test the hypotheses. The research model was constructed to interpret the degree of enhancement in audit quality as a function of digital transformation across its four dimensions.

Section Two: Theoretical Framework of the Study

Recent years have witnessed tremendous technological advancements across all fields, driven by the implementation of digital transformation strategies. Digital transformation represents a fast-paced technological tool that relies on smart contracts, advanced information infrastructure, and the integration of these technologies into auditing practices. This transformation enhances the ability to analyze data and communicate information more efficiently and effectively, thereby contributing to the improvement of audit quality.

1. The Concept of Digital Transformation

The concept of digital transformation has become one of the most widely discussed topics in recent times. Many studies have addressed it as one of the key technological innovations influencing the advancement of the auditing profession. Digital transformation refers to the way organizations utilize digital technologies to develop new business models that create greater value. It involves the adoption of modern digital technologies within organizations and the reengineering of their business models in an effort to improve and adapt them to the demands of the digital era.

Digital transformation is defined as the process of converting data and information into digital formats shifting from physical artifacts to digital equivalents. This includes transitioning from paper-based invoicing to electronic invoicing, and using technology and digital data to transform business operations and create a digital business environment capable of keeping pace with emerging digital innovations in the external environment.

It is considered a comprehensive and integrated program encompassing all organizational functions, facilitating the transfer of digital instructions, and enabling structural changes in tasks and procedures. This transformation enhances data processing capacity, adds vast storage capabilities, and provides more accurate information at lower costs and higher quality thus playing a vital role in decision-making processes.

In the same context, the Basel Committee, through the Financial Stability Board, referred to digital transformation as a form of financial innovation based on the use of technology. It has the potential to generate innovative strategic models, processes, or products that significantly impact financial markets, institutions, and the provision of financial services (Abu Al-Ala, Metwally, 2024, p. 175).

2. Digital Transformation Technologies

Digital transformation is characterized by the integration of several advanced information technologies. Among the most important of these technologies are the following (Shaaban et al., 2021, p. 53; Abu Al-Ala & Metwally, 2024, p. 178):

1. Cloud Computing

Cloud computing is considered a form of outsourcing computer software services. It is defined by five key technical characteristics: broad network access, high scalability and flexibility, shared resource pooling, dynamic resource scheduling, and general-purpose utility. Cloud computing delivers IT services through third-party providers and ensures continuous access to a wide range of IT resources via internet connectivity. For external auditors, cloud computing offers numerous services, most notably the ease of access to the financial data required to efficiently perform auditing functions in a timely manner.

2. Artificial Intelligence (AI)

AI is one of the most influential computing applications capable of studying and performing tasks traditionally executed by accountants. It enables automation of accounting operations and simulates perception, comprehension, and execution of accounting work in a short time. AI assists auditors by enhancing task efficiency and providing necessary audit evidence. The rapid evolution of AI continues to generate transformative effects across industries. Once automation becomes significantly cheaper than labor, organizations are expected to adopt AI to replace parts of the workforce, especially for programmable, repetitive tasks.

3. Big Data and Its Analytics

Auditing has entered a new era with the emergence of big data, where vast volumes of data are produced and stored, becoming a major strength for companies. Big data gives external auditors a greater role in improving fraud risk assessments, as they can analyze entire data sets rather than summarized samples. It also significantly enhances data processing capabilities. Big data generally refers to data sets that are extremely large and complex, making them difficult to manage and analyze using traditional tools and techniques.

4. Blockchain Technology

Blockchain consists of a network of nodes (computers), where each node stores a ledger of transactions occurring within the system. Transactions are grouped into encrypted blocks, each linked to the subsequent one, forming an immutable, time-stamped digital ledger shared across the internet. Blockchain offers auditors both opportunities and challenges. Key opportunities include the immutability of stored data, transparency of transactions, and the ability to verify and disclose them in reports. Blockchain allows auditors to audit and test all transactions within a period, eliminating the need for traditional sampling methods. Furthermore, it enables real-time, continuous auditing of a company's transactions over the internet.

3. The Concept of Audit Quality

The concept of audit quality is relatively recent and should be emphasized as one of the contemporary trends in auditing. It is also a dynamic and evolving topic. Audit quality is considered a goal in itself for accounting and auditing firms. Since it is closely linked to the audit as a product, it must fulfill the needs of the demand side particularly third parties and stakeholders involved in the audited entity. In recognition of its importance, professional organizations have established committees and issued standards aimed at enhancing audit quality (Abdul Hassan, 2013, p. 64).

According to Humaidat (2002, p. 56), audit quality is defined as the probability that an auditor will discover weaknesses or gaps in the client's accounting system and report them in the issued audit report.

Audit quality has become a central issue in the auditing profession. Since 1981, researchers have sought to define audit quality, identify its measurement methods, and study its various dimensions. One of the earliest and most influential definitions came from DeAngelo, who defined audit quality as "the probability that an auditor will both discover a material misstatement in the financial statements if one exists and report it once discovered" (Al-Zuhairi, 2014, p. 61).

4. The Importance of Audit Quality

The importance of audit quality lies in ensuring that the services provided by the auditor are performed with efficiency and effectiveness and that appropriate oversight has been maintained. This results in the auditor demonstrating objectivity and integrity, thereby enhancing the confidence of all stakeholders in the audit report. In essence, audit quality is not an optional attribute. Without it, the reliability and credibility of the auditor and consequently the information presented would be severely undermined (Khalaf, 2019, p. 39).

The importance of audit quality is further reflected in the following key areas (Noaman, 2020, p. 17):

1. Achieving the Primary Objective of Auditing:

Audit quality ensures the fundamental goal of auditing is met namely, obtaining reasonable assurance that the financial report as a whole is free from material misstatements.

2. Addressing Material Misstatements:

It guarantees that any material errors identified during the audit process are appropriately addressed or disclosed in the audit report.

3. Avoiding Professional and Legal Sanctions:

High audit quality helps audit firms avoid legal and professional penalties arising from misconduct or negligence. This is accomplished by ensuring compliance with national and international auditing standards, relevant laws and regulations, and through effective evaluation of client risk. It also involves implementing robust hiring and promotion policies focused on well-qualified, highly experienced professionals from diverse disciplines who possess strong objectivity.

4. Narrowing the Audit Expectation Gap:

Audit quality plays a crucial role in reducing the audit expectation gap the difference between what the public expects from auditors and what auditors actually deliver or are perceived to deliver.

5. Reducing Agency Costs:

Increased conflict between the interests of agents (management) and principals (shareholders) raises agency costs. Therefore, there is a greater demand for high-quality audit services in firms with significant interest misalignments, compared to firms where such conflicts are minimal and agency costs are lower.

6. Elements of Audit Quality

In 1978, the American Institute of Certified Public Accountants (AICPA) established the Quality Control Standards Committee (QCSC), assigning it the responsibility of assisting licensed public accounting firms in developing and implementing quality control standards. The QCSC identified nine key elements of quality control that accounting firms must consider when designing their policies and procedures (Al-Zuhairi, 2014, p. 61):

1. Independence

Individuals at all organizational levels must maintain independence to the extent required by professional codes of conduct.

2. Assignment of Personnel (Task Allocation)

Personnel should be assigned to specific audit engagements in a manner that ensures the work is performed by individuals possessing the required level of technical training and proficiency appropriate to the circumstances.

3. Supervision

Audit firms must provide reasonable assurance that auditing tasks are performed or supervised at all organizational levels in accordance with the firm's quality standards.

4. Consultation

Employees must seek consultation when necessary from individuals who possess adequate levels of knowledge, competence, judgment, and authority.

5. Hiring

Hiring practices should ensure the firm is staffed with personnel who possess the appropriate attributes to perform efficiently. Ultimately, the quality of the firm's work depends on the integrity, capability, and motivation of those who carry out and oversee the audit tasks. Therefore, recruitment and support programs are essential for maintaining audit quality.

6. Professional Development

Professional development programs should provide reasonable assurance that staff possess the required knowledge to fulfill their assigned responsibilities. Ongoing education and training activities are essential to equipping employees with the knowledge needed to perform their duties and advance within the firm.

7. Promotion

Promotion policies must provide reasonable assurance that individuals selected for advancement possess the qualifications necessary to fulfill their future responsibilities. These qualifications include good reputation, intelligence, sound judgment, and motivation.

8. Client Acceptance and Continuance

Decisions regarding client acceptance and continuance should be guided by the aim of reducing the likelihood of associating with clients whose management lacks integrity. It is prudent for audit firms to be selective in forming professional relationships.

9. Inspection

Internal inspection activities must be implemented to provide reasonable assurance that procedures related to other elements of quality control are effectively applied.

7. Characteristics of Audit Quality

Audit quality has recently attracted wide professional and academic attention. Due to the diversity of its definitions, the concept of audit quality has evolved into a broad and comprehensive term encompassing multiple characteristics. The Committee of the Heads of the Supreme Audit Institutions (SAIs) of the European Union emphasized that quality refers to the degree to which a set of attributes associated with the audit profession meets the requirements of the audit process. The most notable characteristics include the following (Al-Suwaidawi, 2021, p. 39):

1. Integrity and Objectivity

The auditor must express a fair, impartial, and unbiased professional opinion. This opinion should be grounded in facts, sound reasoning, and thorough analysis.

2. Timeliness

Audit results must be delivered promptly and within the specified deadlines. Timeliness also means providing audit findings when they are needed to address management weaknesses or to support timely decision-making.

3. Credibility

The information presented in the auditor's report must be accurate and faithfully represent the true financial position and performance of the audited entity.

4. Conciseness and Clarity

Auditor reports should be concise, clear, and easily understood by stakeholders, enabling them to make well-informed decisions. High-quality audit outputs are marked by their transparency and accessibility to all users.

5. Effectiveness and Efficiency

Effectiveness refers to how well audit results are accepted by the client, while efficiency pertains to the reasonable and sufficient allocation of audit resources, which should be aligned with the importance and complexity of the audited activities.

6. Materiality

The information included in the audit report should be relevant and significant to stakeholders. This can be assessed based on several dimensions, such as the financial size of the audited entity and the impact of its performance on major national policies or broader societal concerns.

7. Applied Methods

The methodologies adopted to ensure quality are critical characteristics, especially in a competitive environment. Effective and innovative methods can enhance the reputation and client base of audit firms.

8. Compliance with Professional Standards

Adherence to professional standards is essential to audit quality. Auditors must carry out their responsibilities with full professionalism, objectivity, and independence, strictly following established plans, policies, and procedures without external interference. They must avoid any circumstances that may suggest bias or alignment with management.

8. The Relationship Between Digital Transformation and Audit Quality

Recent years have witnessed significant technological advancements across various fields through the adoption of digital transformation strategies. These strategies leverage rapid technological tools such as smart contracts and advanced information technology infrastructure, which have been applied to the auditing process, enhancing data analysis capabilities and improving the communication of information more efficiently and effectively. This, in turn, positively impacts the quality of the audit process.

Digital transformation represents a qualitative leap for institutions and companies due to major developments in information and communication technology, alongside the emergence of the big data revolution. This revolution has expanded the scope of electronic services and enabled vast data storage capacities regardless of data size, at minimal cost and effort. Consequently, this has influenced the use of information technology in financial and accounting systems and the activation of internal control mechanisms. These developments have led to the integration of modern technologies associated with digital transformation into auditing practices.

Digital transformation is a phenomenon that refers to organizations using digital technologies to create new digital value streams or to transform from existing business models to new ones. It represents a fundamental and comprehensive change and development in the infrastructure of business performance models, relying on emerging technologies either partially or entirely to gain a competitive advantage and achieve added value. Digital transformation is considered the most widespread phase describing change at the organizational level, leading to the development of new business models that significantly impact accounting systems and the information they produce. This necessitates effective control and risk management related to these changes.

The quality of companies' accounting information is closely linked to surrounding technological advancements, extending to the final product of the accounting system the financial reports. Accordingly, these changes have brought about modifications in the activities and functions of the auditing profession through the use of emerging digital technologies. These technologies play a pivotal role in enhancing audit procedures, making them more flexible and capable of shifting negative perceptions about auditing practices (Abu Al-Ala & Metwally, 2024, p. 168).

As explained by Rashwan and Abu Arab (2022, p. 42), modern technologies and the digital transformation brought about by the Fourth Industrial Revolution have contributed to audit quality through the following:

1. A significant increase in data volume accompanied by the emergence of new scientific concepts, advanced practical applications, and sophisticated analytics, in addition to the advent of intelligent processors.
2. The emergence of Internet of Things (IoT) technology, blockchain, and the introduction of robotics into the business world, all of which have a substantial impact on accounting and auditing.
3. The introduction of changes in general concepts related to planning, analysis, and design of information systems in general, and specifically in accounting information system principles and design, through the incorporation of elements such as robotics and blockchain. This has added new dimensions to the lifecycle of accounting information systems.
4. A significant reduction in traditional manual tasks for both internal and external auditors, replaced by more analytical and consultative roles, along with a shift in roles between humans and robots in many accounting processes and internal control procedures.
5. Improvement in the quality of financial reports, enhancing their reliability, relevance, and the overall quality of accounting information.

6. Extensive integration among technologies, leading to complex interrelationships between management, accounting, and auditing functions.

The importance of digital transformation and its advanced methods lies in their impact on the steps and stages of the auditing process, as well as on the factors influencing audit management. This is due to the auditor's reliance on these technologies when forming their professional opinion in compliance with international auditing standards. Therefore, the relationship between digital transformation technologies and audit quality manifests through their influence on the stages of audit execution as follows (Abu Al-Ala & Metwally, 2024, p. 180):

1. Pre-Engagement Acceptance Stage as a Foundation for the Firm's Reputation:

At this stage, the auditor avoids engaging with high-risk clients regardless of the fees offered, because accepting to audit such a client exposes the auditor to legal liabilities, both short- and long-term. Hence, the auditor must obtain sufficient information to evaluate the client's business risks. Here, artificial intelligence plays a crucial role as the most innovative and powerful technology compared to others. It is the only technology comparable to human intelligence and its results can be trusted to a considerable extent.

2. Engagement Acceptance Stage as a Basis for Auditor's Professional Skepticism:

The decision to accept an engagement is challenging due to conflicting pressures between programming considerations and professional judgment. The auditor faces risks associated with client acceptance, including client business risks arising from external or industry changes beyond the auditor's control. Audit risk is affected by factors such as significant weaknesses in the internal control system, failure to prepare timely reports, and risks related to the auditor's reputation, litigation costs, and potential non-compliance with auditing standards. Big data influences this stage by:

Allowing the auditor to collect and analyze databases from various sources, using intelligent information systems to verify data reliability and assess preliminary risks, thereby providing contractual information in advance for smoother agreement completion.

Enabling the auditor to use expert systems or decision support systems to objectively decide whether to accept or reject the engagement based on anticipated risks.

3. Audit Planning Stage as a Basis for Pricing the Audit:

During this stage, the auditor gathers more audit evidence to increase confidence in the audit process by ensuring no material errors or irregularities exist. Big data provides high-quality audit evidence and valuable business insights, enabling auditors to better identify fraud risks and operational business risks through advanced data analytics.

4. Audit Execution Stage as a Basis for Potential Litigation Risks:

Auditors generally expect that the digitization of auditing through digital tools such as data analytics, data extraction, cloud computing, and cognitive technologies will lead to more value-relevant audits for clients. Digitization enhances the efficiency of audit-related tasks, thereby improving auditors' reputations.

Axis Three: Discussion of Results and Hypotheses Testing

First: Research Population and Sample

The research field is represented by Tikrit University, while the research population consists of academic individuals specializing in accounting, including faculty members and postgraduate students (master's and doctoral candidates). This population was selected due to the specificity of the researched topic, which involves contemporary and advanced technologies within digital

transformation that require academic knowledge of these technologies knowledge available within this population.

A comprehensive sampling method was used, where an electronic questionnaire was distributed to the entire research population of 72 individuals. The number of valid returned questionnaires for analysis was 53, representing a response rate of 73.6%. This figure constitutes the approved sample for data collection.

Table (1) presents the details of the research sample.

Item	Number	Percentage (%)
Questionnaires Distributed	72	100%
Questionnaires Returned	53	73.6%

Source: Table prepared by the researcher.

Second: Description of the Research Instrument and Measurement of Variables

The researcher formulated and prepared a questionnaire based on several studies related to the research topic. The purpose was to collect primary and reliable data to measure the research variables. The questionnaire was divided into two main sections:

The first section included demographic information reflecting the personal characteristics of the sample individuals. It consisted of three items: gender, educational attainment, and years of experience.

The second section focused on measuring the research variables and included two types of variables:

The independent variable represented by digital transformation, measured through 12 statements distributed across four dimensions: (1) Cloud Computing, (2) Big Data, (3) Blockchain, and (4) Artificial Intelligence, with three statements for each dimension.

The dependent variable represented by audit quality, measured through 10 statements. Table (2) shows the structure of the questionnaire.

Table (2): Structure of the Questionnaire

Axis	Item	Dimensions	Code	Number	Sequence
First Axis: Demographic Information	Gender		G		
	Educational Attainment		Q		
	Years of Experience		E		
Second Axis: Independent Variable	Digital Transformation	Cloud Computing	xx1	3	1-3
		Big Data	xx2	3	4-6
		Blockchain	xx3	3	7-9
		Artificial Intelligence	xx4	3	10-12
	Total		X	12	1-12
Third Axis: Dependent Variable	Audit Quality		Y	10	13-22

Source: Table prepared by the researcher.

The questionnaire data were quantified (i.e., converting qualitative data into quantitative) using the five-point Likert scale method, as shown in Table (3).

Table (3): Data Quantification Using the Likert Scale Method

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Score	5	4	3	2	1

Source: Table prepared by the researcher.

The researcher also weighted the mean values of the statements and research variables to determine the degree of agreement intensity. The intensity of agreement was divided into five categories, each with a category length of 0.8, calculated using the following formula:

Category Length = (Highest Value – Lowest Value) / Number of Categories

Category Length = $(5 - 1) / 5 = 0.8$

Table (4) shows the categories of agreement intensity according to the mean values of the statements and research variables.

Table (4): Categories of Agreement Intensity

Item	Degree of Agreement
From 1 to less than 1.8	Very Low
From 1.8 to less than 2.6	Low
From 2.6 to less than 3.4	Moderate
From 3.4 to less than 4.2	High
From 4.2 to 5	Very High

Source: Table prepared by the researcher.

Third: Description of the Sample Individuals

The first section of the questionnaire included three demographic variables: gender, educational attainment, and years of experience, which reflect the personal characteristics of the sample individuals.

Table (5) presents the distribution of the individuals according to their demographic information.

Table (5): Distribution of Individuals by Demographic Information

Information	Category	Number	Percentage (%)
Gender	Male	40	75.5
	Female	13	24.5
Educational Attainment	Master's Student	17	32.1
	Master's Degree	26	49.1
	PhD Student	3	5.7
	PhD Degree	7	13.2
Years of Experience	5 Years or Less	21	39.6
	6–10 Years	14	26.4
	11–15 Years	11	20.8
	16 Years or More	7	13.2

Source: Table prepared by the researcher based on SPSS software.

It is observed from Table (5) that the majority of the sample participants are male, with 40 individuals out of a total sample size of ($n = 53$), representing 75.5%. In contrast, females constituted only 24.5%. This indicates that the majority of the sample, consisting of postgraduate students and faculty members at the College of Administration and Economics, University of Tikrit, are male.

As for educational attainment, individuals holding a master's degree accounted for the highest percentage at 49.1%, followed by master's students at 32.1% of the total sample. This result supports the level of academic cognitive awareness among the sample members, which contributes to obtaining more reliable and valid responses to the questionnaire statements.

Regarding years of experience, the category of individuals with five years or less of service represented the highest proportion at 39.6%, followed by those with 6–10 years of experience at 26.4%, and then individuals with 11–15 years of service at 20.8%. Finally, individuals with 16 years or more represented the lowest proportion. This result supports the level of professional experience among the sample members in answering the questionnaire items.

Fourth: Validity and Reliability Testing of the Questionnaire

The validity and reliability of the questionnaire were tested as follows:

1. Validity Coefficient

The validity coefficient was adopted to test the extent to which the scale is valid. This coefficient was calculated by extracting the square root of the value of Cronbach's Alpha. Table (6) shows that the values of the validity coefficient ranged between (0.877 to 0.960) for the dimensions and variables of the study. These values confirm the validity of the scale and that the questionnaire accurately measures what it was designed to measure.

Table (6): Validity and Reliability of the Questionnaire

Variables and Dimensions	Code	Validity Coefficient	Cronbach's Alpha Coefficient
Cloud Computing	xx1	0.887	0.787
Big Data	xx2	0.877	0.770
Blockchain	xx3	0.895	0.801
Artificial Intelligence	xx4	0.922	0.850
Digital Transformation	X	0.943	0.889
Audit Quality	Y	0.960	0.922

Source: Table prepared by the researcher based on the SPSS program.

2. Internal Consistency

To test the reliability of the research instrument, Cronbach's Alpha coefficient was adopted to determine the possibility of obtaining the same results in the event of repeated data collection under similar conditions, which indicates an acceptable level of response consistency. As observed in Table (6), the values of Cronbach's Alpha ranged from (0.770 to 0.922), which are higher than the standard threshold of 70% for this measure. This supports the reliability of the scale and the possibility of using the questionnaire data in subsequent analyses, given their validity, reliability, and consistency.

Fifth: Descriptive Analysis of the Research Statements and Variables

The arithmetic mean and standard deviation were adopted as statistical methods within the SPSS Ver.22 program in order to describe the research statements that reflect individuals' orientations

and perceptions regarding the questionnaire items. Table (7) presents the description of the statements related to the independent variable: digital transformation.

Table (7): Description of Digital Transformation Statements

S	Statements	Arithmetic Mean	Standard Deviation	Relative Importance	Degree of Agreement
1	Cloud computing protects the confidentiality of the information transmitted through it.	4.340	0.898	86.79%	Very High
2	Cloud computing has technical and organizational measures in place in case of accidental or intentional data loss.	4.189	0.856	83.77%	High
3	Cloud computing helps perform accounting operations accurately and securely.	4.170	0.826	83.40%	High
4	The use of large volumes of data enables the company to predict future expectations for many important decisions.	4.509	0.846	90.19%	Very High
5	The company has the capability to extract data from its various sources at high speed.	4.264	0.812	85.28%	Very High
6	High-precision big data helps solve many issues faced by companies.	4.075	0.937	81.51%	High
7	Blockchain systems provide a high level of security and trust required for modern digital transactions.	4.226	0.800	84.53%	Very High
8	Blockchain uses three principles encryption, decentralization, and consensus to create a highly secure software system that is nearly impossible to manipulate.	4.245	0.918	84.91%	Very High
9	Blockchain is characterized by data immutability after recording and real-time ease of access to stored data.	4.170	0.871	83.40%	High
10	Artificial intelligence technologies play a vital role in the digital transformation of accounting.	4.226	0.800	84.53%	Very High

11	Artificial intelligence helps detect fraud and improve the efficiency of financial accounting operations.	4.113	0.993	82.26%	High
12	Artificial intelligence applications contribute to making financial processes accurate and secure.	4.057	0.929	81.13%	High

Source: Table prepared by the researcher based on the SPSS program.

It is observed from Table (7) that there is a high level of perception and agreement regarding the digital transformation statements among the sample individuals, as indicated by the high arithmetic mean, which exceeded the standard value of (3). In addition, all the statements related to the digital transformation variable showed high relative importance. Specifically, Statement No. (4), which represented "The use of large volumes of data enables the company to predict future expectations for many important decisions", recorded the highest level of agreement, with an arithmetic mean of (4.509) and a relative importance of (90.19%). On the other hand, Statement No. (12), which represented "Artificial intelligence applications contribute to making financial processes accurate and secure", recorded the lowest level of agreement, with an arithmetic mean of (4.057) and a relative importance of (81.13%).

Meanwhile, the low standard deviation values for all statements of the variable indicate the absence of dispersion in the responses of the sample individuals, which enhances the reliability and consistency of the arithmetic mean. This reflects the presence of availability and agreement regarding all digital transformation statements from the perspective of the research sample members at the College of Administration and Economics / University of Tikrit.

Table (8): Description of Audit Quality Statements

S	Statements	Arithmetic Mean	Standard Deviation	Relative Importance	Degree of Agreement
13	Commitment of audit firms and offices to professional standards.	4.5849	.71881	91.70%	Very High
14	Maintaining professional skepticism and performing audit work in accordance with the principles and ethics of the profession.	4.5283	.72334	90.57%	Very High
15	Effectiveness of the policies, procedures, and plans developed by the audit firm to assist in completing audit operations.	4.4906	.66860	89.81%	Very High
16	Precise and in-depth professional knowledge of clients' various activities as part of the audit firm's professional performance.	3.7358	1.42978	74.72%	High
17	Reduction of the expectation gap or minimizing the variance between	3.8302	1.29698	76.60%	High

	stakeholders' expectations and the auditor.				
18	Independence of the auditor and their team.	3.6604	1.41344	73.21%	High
19	Ensuring that the audited financial reports are prepared in accordance with generally accepted accounting principles.	3.9265	1.28376	78.53%	High
20	The commitment of audit firms to training their auditors contributes to improving their professional performance.	4.0755	1.15773	81.51%	High
21	Establishing good professional relationships with other audit firms contributes to enhancing audit effectiveness.	4.0943	1.27497	81.89%	High
22	The firm implements planning, execution, and supervision procedures in accordance with the required quality standards.	3.9245	1.32794	78.49%	High

Source: Table prepared by the researcher based on the SPSS program.

It is observed from Table (8) that there is a high level of perception and agreement regarding the audit quality statements among the sample individuals, as indicated by the high arithmetic mean, which exceeded the standard value of (3). In addition, all statements related to the audit quality variable showed high relative importance. Specifically, Statement No. (13), which represented "Commitment of audit firms and offices to professional standards", recorded the highest level of agreement, with an arithmetic mean of (4.5849) and a relative importance of (91.70%). On the other hand, Statement No. (18), which represented "Independence of the auditor and their team", recorded the lowest level of agreement, with an arithmetic mean of (3.6604) and a relative importance of (73.21%).

Meanwhile, the low values of standard deviation across all statements indicate the absence of dispersion in the responses of the sample individuals, which enhances the reliability and consistency of the arithmetic mean. This reflects the availability and agreement regarding all audit quality statements from the perspective of the research sample members at the College of Administration and Economics / University of Tikrit.

Table (9) presents the descriptive analysis of the overall research variables and dimensions, based on the researcher's use of central tendency measures such as the arithmetic mean, standard deviation, and others.

Table (9): Descriptive Analysis of the Overall Research Variables and Dimensions

Variables and Dimensions	Code	Arithmetic Mean	Standard Deviation	Minimum Value	Maximum Value	Relative Importance	Degree of Agreement
1. Cloud Computing	xx1	4.233	0.675	2.00	5.00	84.65%	Very High
2. Big Data	xx2	4.283	0.717	1.67	5.00	85.66%	Very High
3. Blockchain	xx3	4.214	0.731	2.00	5.00	84.28%	Very High
4. Artificial Intelligence	xx4	4.132	0.799	1.33	5.00	82.64%	High
Digital Transformation	X	4.215	0.588	1.75	5.00	84.31%	High
Audit Quality	Y	4.085	0.893	1.90	5.00	81.70%	High

Source: Table prepared by the researcher based on the SPSS program.

It is observed from Table (9) that there is a high level of agreement regarding the digital transformation variable and all its four dimensions (1. Cloud Computing, 2. Big Data, 3. Blockchain, 4. Artificial Intelligence), as indicated by the arithmetic mean values exceeding the standard value of (3). Furthermore, the relative importance of this variable and all its dimensions is high. The digital transformation variable recorded an arithmetic mean of (4.215) and a relative importance of (84.31%), which are high values confirming the availability of digital transformation in the studied environment represented by the College of Administration and Economics / University of Tikrit.

At the level of the dimensions of the digital transformation variable, it is noted that the dimension of (2. Big Data) recorded the highest level of agreement, with an arithmetic mean of (4.283) and a relative importance of (85.66%), followed by the dimension of (1. Cloud Computing) with an arithmetic mean of (4.233) and a relative importance of (84.65%), then (3. Blockchain) with an arithmetic mean of (4.214) and a relative importance of (84.28%), and finally (4. Artificial Intelligence) with an arithmetic mean of (4.132) and a relative importance of (82.64%).

The low standard deviation values indicate a low level of dispersion in the responses of the sample individuals, supporting the consistency of these responses and thus reinforcing the reliability of the arithmetic mean in generalizing its results to the entire sample. This reflects a significant availability of digital transformation and its four dimensions in the environment of the College of Administration and Economics / University of Tikrit, the research site.

Table (9) also shows a high level of agreement regarding audit quality, as indicated by the computed arithmetic mean of (4.085) for this variable, which exceeds the standard value of (3), alongside a high relative importance of (81.70%). The low standard deviation values further indicate low dispersion in the sample responses, supporting the consistency and reliability of the arithmetic mean in generalizing its results to the entire sample, which demonstrated a high perception of audit quality among the sample individuals at the College of Administration and Economics / University of Tikrit.

Sixth: Test of Normality of the Data Distribution

The researcher relied on both the Skewness and Kurtosis coefficients to test the normality of the data distribution. Normality is fundamental for selecting the type of statistical methods used to test the research hypotheses, whether parametric (if the data are normally distributed) or non-parametric otherwise. Data are considered normally distributed if the skewness coefficient ranges between (+1 and -1) and the kurtosis coefficient ranges between (+3 and -3). Table (10) shows that the calculated values for skewness and kurtosis fall within the specified ranges, indicating that the data approximate a normal distribution. Therefore, parametric statistical methods can be used to test the research hypotheses.

Table (10): Skewness and Kurtosis Values

Variables and Dimensions	Code	Skewness Coefficient	Kurtosis Coefficient
1. Cloud Computing	xx1	-.044-	1.023
2. Big Data	xx2	-.349-	2.261
3. Blockchain	xx3	-.431-	2.290
4. Artificial Intelligence	xx4	-.065-	1.379
Digital Transformation	X	-.542-	2.651
Audit Quality	Y	-.983-	-.136-

Source: Table prepared by the researcher based on the SPSS program.

Seventh: Hypothesis Testing

This section included one main hypothesis as follows:

(H1) Main Hypothesis 1: There is a significant correlation between digital transformation overall and all its dimensions with audit quality from the perspective of the sampled individuals.

To test this hypothesis, Pearson's correlation coefficient was calculated to determine the significance, strength, and direction of the relationship between digital transformation overall and all its dimensions with audit quality. Table (11) shows the values of the correlation coefficients.

Table (11): Correlation Coefficients Between Digital Transformation Overall and Its Dimensions with Audit Quality

Variables and Dimensions		Audit Quality
1. Cloud Computing	Pearson Correlation Coefficient	0.452 ^{**}
	Significance (Sig.)	0.001
2. Big Data	Pearson Correlation Coefficient	0.501 ^{**}
	Significance (Sig.)	0.000
3. Blockchain	Pearson Correlation Coefficient	0.295 [*]
	Significance (Sig.)	0.032
4. Artificial Intelligence	Pearson Correlation Coefficient	0.430 ^{**}
	Significance (Sig.)	0.001
Digital Transformation	Pearson Correlation Coefficient	0.520 ^{**}
	Significance (Sig.)	0.000

() Statistically significant at the 1% significance level, (*) statistically significant at the 5% significance level.**

Source: Table prepared by the researcher based on the SPSS program.

It is noted from Table (11) that there is a significant positive (direct) correlation between digital transformation with its four dimensions (1. Cloud Computing, 2. Big Data, 3. Blockchain, 4. Artificial Intelligence) and the audit quality variable. This means that a high level of digital transformation in the researched organization is accompanied by a corresponding increase in audit quality. At the dimension level, it is observed that the dimension (2. Big Data) has the highest correlation with audit quality, followed by (1. Cloud Computing), then (4. Artificial Intelligence), and finally (3. Blockchain). Therefore, the main hypothesis one is accepted.

Eighth: Testing the Effect Hypotheses

This section included one main hypothesis as follows:

(H2) Main Hypothesis 2: There is a significant effect of digital transformation overall and all its dimensions on audit quality from the perspective of the sampled individuals.

It branches into five sub-hypotheses as follows:

(H2.1) First sub-hypothesis: There is a significant effect of digital transformation overall and all its dimensions on audit quality from the perspective of the sampled individuals.

To test this hypothesis, a simple linear regression equation was prepared to estimate audit quality based on the cloud computing dimension, to determine the extent of its effect on audit quality. Table (12) shows the results of this effect.

Table (12): Results of the Effect of Digital Transformation Overall and Its Dimensions on Audit Quality

Dimensions	Beta (β)	T-value	Significance (Sig.)	F-value	Significance (Sig.)	R^2	Significance
1. Cloud Computing	0.452	3.616	0.001	13.073	0.001	0.204	Statistically Significant
2. Big Data	0.501	4.137	0.000	17.117	0.000	0.251	Statistically Significant
3. Blockchain	0.295	2.203	0.032	4.852	0.032	0.087	Statistically Significant
4. Artificial Intelligence	0.430	3.399	0.001	11.553	0.001	0.185	Statistically Significant
Digital Transformation	0.520	4.353	0.000	18.951	0.000	0.271	Statistically Significant

Source: Table prepared by the researcher based on the SPSS program.

It is observed from Table (12) that the regression model is statistically valid, as indicated by the F-value of (13.073) at a significance level less than 5%, meaning that audit quality can be estimated based on the cloud computing dimension. The T-value of (3.616) at a 5% significance level indicates a significant effect, while the positive Beta (β) coefficient of (0.452) shows that this effect is positive. This means that the availability of the cloud computing dimension will enhance and activate the levels of audit quality from the perspective of the research sample at the College of Administration and Economics / University of Tikrit. The determination coefficient (R^2) of (0.204) indicates that the cloud computing dimension explains 20.4% of the variation occurring in audit quality. Based on these results, the first sub-hypothesis is accepted.

(H2.2) Second Sub-Hypothesis: There is a significant effect of big data on audit quality from the perspective of the sampled individuals.

To test this hypothesis, a simple linear regression equation was prepared to estimate audit quality based on the big data dimension to determine the extent of its effect on audit quality. It is observed from Table (12) that the regression model is statistically valid, as indicated by the F-value of (17.117) at a significance level less than 5%, meaning that audit quality can be estimated based on the big data dimension. The T-value of (4.137) at a 5% significance level indicates a significant effect, while the positive Beta (β) coefficient of (0.501) shows that this effect is positive. This means that the availability of the big data dimension will enhance and activate the levels of audit quality from the perspective of the research sample at the College of Administration and Economics / University of Tikrit. The determination coefficient (R^2) of

(0.251) indicates that the big data dimension explains 25.1% of the variation occurring in audit quality. Based on these results, the second sub-hypothesis is accepted.

(H2.3) Third Sub-Hypothesis: There is a significant effect of blockchain on audit quality from the perspective of the sampled individuals.

To test this hypothesis, a simple linear regression equation was prepared to estimate audit quality based on the blockchain dimension to determine the extent of its effect on audit quality. It is observed from Table (12) that the regression model is statistically valid, as indicated by the F-value of (4.852) at a significance level less than 5%, meaning audit quality can be estimated based on the blockchain dimension. The T-value of (2.203) at a 5% significance level indicates a significant effect, while the positive Beta (β) coefficient (value missing) shows this effect is positive. This means the availability of the blockchain dimension will enhance and activate audit quality levels from the perspective of the research sample at the College of Administration and Economics / University of Tikrit. The determination coefficient (R^2) of (0.087) indicates that the blockchain dimension explains 8.7% of the variations occurring in audit quality. Based on these results, the third sub-hypothesis is accepted.

(H2.4) Fourth Sub-Hypothesis: There is a significant effect of artificial intelligence on audit quality from the perspective of the sampled individuals.

To test this hypothesis, a simple linear regression equation was prepared to estimate audit quality based on the artificial intelligence dimension. Table (12) shows the regression model is valid with an F-value of (11.553) at a significance level less than 5%, indicating audit quality can be estimated based on artificial intelligence. The T-value of (3.399) at 5% significance indicates a significant effect, and the positive Beta (β) coefficient of (0.430) indicates a positive effect. This means the availability of artificial intelligence will enhance audit quality levels from the perspective of the research sample at the College of Administration and Economics / University of Tikrit. The R^2 value of (0.185) indicates artificial intelligence explains 18.5% of variations in audit quality. These results support accepting the fourth sub-hypothesis.

(H2.5) Fifth Sub-Hypothesis: There is a significant effect of digital transformation overall on audit quality from the perspective of the sampled individuals.

To test this hypothesis, a simple linear regression equation was prepared to estimate audit quality based on overall digital transformation. Table (12) indicates the model is valid with an F-value of (18.951) at a significance level below 5%, indicating audit quality can be estimated based on digital transformation. The T-value of (4.353) at 5% significance indicates a significant effect, and the positive Beta (β) coefficient of (0.520) shows a positive effect. This means the availability of digital transformation will enhance audit quality levels from the perspective of the research sample at the College of Administration and Economics / University of Tikrit. The R^2 value of (0.271) indicates digital transformation explains 27.1% of the variation in audit quality. Based on these results, the fifth sub-hypothesis is accepted.

Based on the results of the five sub-hypotheses, the main hypothesis two is accepted.

Axis Four: Conclusions and Recommendations

First: Conclusions

Based on the discussion in both the theoretical and practical aspects of the research, the following key conclusions were reached:

1. There is a recurring research focus on discussing digital transformation technologies within accounting literature and their impact on accounting practices, including the reciprocal relationships in the influence process, indicating a promising future for expanding scientific research in this area.

2. The research sample individuals have a high level of awareness regarding the importance of digital transformation and the significance of adopting its four key technologies within Iraqi companies, due to the anticipated benefits of their application and implementation.
3. The research sample individuals demonstrate a high level of awareness regarding the potential to improve audit quality and the importance of this improvement process in the Iraqi environment.
4. There is a significant positive correlation between digital transformation with its four dimensions (1. Cloud Computing, 2. Big Data, 3. Blockchain, 4. Artificial Intelligence) and audit quality. This means that the availability of these technologies in the companies under audit is accompanied by an increase in audit quality, according to the perceptions of the sample individuals.
5. Digital transformation has a significant positive effect on raising audit quality levels. The adoption of digital transformation technologies by audited companies acts as a catalyst to enhance audit operations and skills, keeping pace with the requirements appropriate for this transformation.
6. The impact of the digital transformation technologies (dimensions) on the improvement and enhancement of audit quality varies. The dimension (2. Big Data) showed the highest positive effect, followed by (1. Cloud Computing), then (4. Artificial Intelligence), and finally (3. Blockchain). This indicates that within digital transformation, some technologies are more effective than others in stimulating processes that improve audit quality.

Second: Recommendations

Based on the theoretical and practical conclusions of the research, the following key recommendations are proposed:

1. Encourage companies to adopt digital transformation technologies due to their importance in developing company performance and activating digital accounting outputs.
2. Expand the scope of scientific research related to digital transformation technologies, as these have become a reality mirroring advanced countries and are expected to be adopted in developing countries, including the local environment of Iraq.
3. External audit firms should develop their professional staff's capabilities in using and handling digital transformation technologies to be adequately prepared for auditing companies that adopt such technologies.
4. Organize training courses and workshops to educate professional practitioners, including accountants and auditors, about digital transformation technologies. These courses and workshops should be delivered by academic professors specialized in this field.

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