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Article

The Impact of Digital Transformation on the Development of the Professional Competence of the External Auditor (Field Study in Audit Companies in Iraq)

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Abstract: This study aimed to demonstrate the impact of digital transformation in the development of the professional competence of the external auditor among Iraqi audit firms, given the increasing expansion in the use of digital technologies within the audit environment and the accompanying challenges related to the development of professional skills and raising the standard of performance. The study started from the problem of the lack of clarity of the degree of influence of applications for digital transformation, especially big data analysis and electronic auditing, in enhancing the professionalism of the external auditor in the Iraqi environment. The study sought to measure this effect and test the relationship between the research variables. The study adopted the descriptive analytical approach, and the questionnaire was used as a main tool for data collection, as (130) questionnaires were distributed to employees of Iraqi audit companies, and (120) questionnaires were retrieved valid for statistical analysis using the SPSS V29 program. The results showed a statistically significant positive impact of digital transformation in the development of The external auditor's professional proficiency, and also showed that electronic auditing was the most influential compared to big data analysis, with strong positive correlations between the study variables. The study concluded that the adoption of digital technologies contributes to raising the efficiency of the external auditor and improving the quality of professional performance, and recommended increasing investment in the digital infrastructure, enhancing continuous training programs, and expanding the use of electronic audit tools and data analysis in keeping with the demands of the audit profession's digital transformation.

Keywords: digital transformation, professionalism, external auditor, electronic audit, Big Data Analysis.

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1. Introduction

In recent years, the world has been witnessing an accelerated digital transformation that has brought about fundamental changes in the business environment, management methods, accounting and auditing, due to the substantial advancements in information and communication technologies, artificial intelligence, big data analysis and cloud computing. Organizations of all kinds are increasingly relying on digital technologies to improve the efficiency of their operations and enhance their decision-making ability in an environment characterized by constant change and

increasing competition. Digital transformation is more than just the use of technology, as it represents a comprehensive strategic shift in business methods, knowledge management and process redesign to achieve efficiency, flexibility and sustainability, which has made it one of the most important topics that have received the attention of researchers and professional organizations in recent years. In light of this transformation, the profession of external audit has witnessed accelerated developments imposed by the modern digital environment, where the external auditor no longer relies on traditional examination methods, but has become required to use advanced tools and techniques capable of dealing with enormous volumes of non-financial and financial data, and extracting important information to make wise professional decisions. Among the most well-known digital transformation tools that have helped to change audit practices are big data analysis and electronic auditing. These technologies make it possible to improve the quality of audit evidence, increase the effectiveness of risk assessment, detect errors and fraud indicators more quickly and accurately, improve the quality of professional reports, and increase the dependability of audit results. International Professional Standards also confirm that the development of professional competence of auditors requires the possession of advanced digital skills commensurate with the nature of the digital business environment. The influence of digital transformation on the audit profession has been the subject of a growing number of scientific research, reflecting this global trend [1]. Numerous recent studies have shown that the use of digital technologies improves audit quality., improving the efficiency of professional performance, and enhancing the ability to analyze data and make decisions. Other studies have also focused on the importance of continuous training, developing digital skills, and creating the necessary technological infrastructure to ensure the successful implementation of digital transformation within audit companies. This growing interest reflects the academic and professional community's awareness of the importance of keeping abreast of technical developments, especially in light of the growing reliance on electronic data and smart systems in the implementation of audits. This study gains scientific importance from the fact that it contributes to enriching the accounting literature on the relationship between digital transformation and the professionalism of the external auditor, especially in developing environments where studies are still limited compared to developed countries. Its applied importance also consists in providing results that can benefit audit companies, professional bodies, universities, and decision makers in developing training programs, updating electronic audit systems, and promoting investment in digital infrastructure to raise the quality of professional services and increase the efficiency of external auditors. Despite the significant developments in this field, the Iraqi environment still faces challenges related to the varying levels of digital technology usage among audit companies, and the limited applied studies that directly addressed the impact of digital transformation on the development of the professional competence of the external auditor inside Iraq. Most of the previous studies focused on different foreign or Arab environments, without providing sufficient field evidence to reflect the reality of Iraqi audit firms, which indicates a knowledge and application gap that requires further research and analysis [2]. Based on this, this study comes to investigate the impact of digital transformation, represented by the use of Big Data Analysis and electronic auditing, in enhancing Iraqi audit firms' external auditors' professional proficiency, in preparation for answering the research problem, testing its hypotheses and achieving its goals in subsequent sections [3].

2. Materials and Methods

Research methodology and previous studies

2.1 Research problem

The use of digital transformation technology has fundamentally changed the external auditing field., which included data analysis and electronic auditing, which contributed to reshaping the methods of professional work of the external auditor. This was reflected in the level of professionalism in terms of improving accuracy, speeding up audit procedures, enhancing the quality of financial reporting. However, the extent of the impact of these technologies on the

development of the professional competence of the Given the differing degrees of use and dependence on contemporary digital techniques, the role of an external auditor in Iraqi audit firms is still uncertain., which necessitates studying this impact scientifically and systematically. It is possible to formulate the primary research hypothesis. **What is the impact of digital transformation on the development of the professional competence of the external auditor in audit companies in Iraq** In light of this, the following sub-problems of the study stand out as follows:

1. What is the impact of the use of data analysis in the development of the professional competence of the external auditor.
2. What is the use of electronic audit in improving the quality of professional performance of the external auditor.

2.2 Research importance

The digital transformation in external audit represents an important input for understanding the development of the professional competence of the external auditor in the contemporary Iraqi environment, and the importance of research can be highlighted through the following :

1. elucidating the connection between digital transformation and the expertise of the external auditor and concentrating on data analysis methods and electronic auditing, the study enhances the accounting and audit literature.
2. provides a theoretical and methodological framework that can be used in future studies to measure the impact of digital technologies on the quality of professional performance in the audit profession.
3. the research helps to raise the dependability and quality of financial reports, which supports decision makers in Iraqi companies and institutions.
4. contributes to improving openness, decreasing errors and financial statement manipulation in the company environment, and increasing the effectiveness of external auditors.

2.3 Research objectives

This research aims to analyze the impact of digital transformation in the development of the professional competence of the external auditor in audit companies in Iraq through the following

1. building a theoretical framework that explains the concepts of digital transformation and its dimensions in the external audit environment and its relationship with the auditor's level of expertise.
2. clarifying the conceptual role of both data analysis and electronic audit in improving the the external auditor's level of professionalism.
3. measuring the impact of the use of data analysis on the development of the professional competence of the external auditor in the Iraqi audit companies.
4. using field data to assess how electronic audits have improved the external auditor's professional performance.

2.4 Research hypothesis

The research is based on the analysis of the relationship between digital transformation and the professionalism of the external auditor in the modern Iraqi audit environment. It is possible to formulate the primary research hypothesis. "**there is a statistically significant impact of digital transformation on the development of professional competence of the external auditor in audit companies in Iraq**". The research's sub-hypotheses are developed in accordance with the primary hypothesis:

1. There is a statistically significant impact of the use of big data analysis in the development of the professionalism of an external auditor.

2. There is a statistically significant impact of the use of electronic audit in improving the quality of professional performance of an external auditor.

2.5 Research limits

This study's analytical and field framework for examining how digital transformation affects external auditors' professional competency.

1. **time limits:** The study's scope is restricted to Iraqi audit businesses' operations in 2026.
2. **spatial boundaries**: the study is conducted in audit companies operating in Iraq, focusing on Class A licensed companies that practice the profession of external audit in the private sector.

2.6 previous studies

The previous studies were divided into several sections, including

Section I: summarizing the essence of previous studies

1. study It aimed to demonstrate the role of digital transformation in enhancing the professional specialization in Information Technology at the external auditor. In the context of Iraq, the study used a quantitative technique., and the results showed that the use of digital technologies contributes to raising the auditor's ability to analyze data and use modern software and improve the quality of professional judgment. .
2. Study She focused on the impact of digital technology on the quality of external audit and its reflection on the value of companies. Using a field approach, the study found that using digital tools in audit procedures enhances the accuracy of the examination and the speed of error detection, which positively reflects on the quality of financial reports.
3. study It aimed to examine how digital transformation technologies may enhance the caliber of external audits. The findings demonstrated that digitization helps to the development of evidence collection and analysis procedures, and supports the practice of continuous auditing, but its full use requires appropriate professional qualification for auditors.
4. The study It addressed the requirements for the digital transformation of the external audit profession, and adopted an analytical approach. She stressed that the success of digital transformation is linked to the availability of an appropriate technical structure, continuous professional training, and updating audit standards and practices that are compatible with the digital world.
5. study I researched the impact of digital transformation on external audit outputs. The results indicated that digitization can improve the efficiency of the audit process and the quality of reports, but it may pose challenges related to Information Security, data protection, and the need for advanced analytical skills among auditors.

Section II comparative and critical analysis of studies

A review of previous studies shows that there is a general agreement that digital transformation is an influential factor in the development of the external audit profession, Whether by increasing the effectiveness of processes or the quality of audits, or enhancing the auditor's ability to deal with electronic data. Arab Studies, in particular have verified that the usage of digital technologies enhances the external auditor's professional performance.. In turn, studies differ in the angle of focus. Some focused on audit quality as the final outcome of the audit process, while the study focused on the professionalism and technical specialization of the auditor. The Foreign Studies dealt with digital transformation from a broader perspective, including organizational and technical requirements and accompanying challenges. From the methodological point of view, Arab studies are characterized by the fact that they have mostly adopted the quantitative field approach, which gives them a good ability to measure the relationships between variables within real work environments. However, some of these studies focused more on the quality of the audit than on The external auditor's professional competency dimensions, such as digital skills, analytical ability,

continuous learning, and the use of electronic audit systems. As for foreign studies, they provided a broader framework for digital transformation, but they did not focus directly on the Iraqi environment, which has specificity in terms of technological structure, The degree of preparedness of audit firms and the type of professional training accessible to external auditors.

Section III general trends in scientific literature

A set of general trends on which modern scientific literature has settled can be drawn: There is a positive relationship between digital transformation and the quality of external audit. The digital and analytical skills of the external auditor are becoming increasingly important. The importance of continuous professional training to keep up with modern technologies. The adoption of electronic audit tools and big data analysis has become a key element in the development of the profession. There are challenges associated with information security, data protection, and the high cost of digital transformation. In contrast, there is still a relative debate about the readiness of all audit offices and companies to adopt digital transformation, and whether digitization automatically leads to improved professionalism, or it depends on the level of qualification, experience and training.

Section IV theoretical and methodological frameworks

Most of the studies are based on the concepts of digital transformation, technology adoption, audit quality, professionalism. In the literature, there is a frequent reliance on technology adoption models and theories of professional performance development, although not all studies disclose in detail the theoretical framework used. In terms of methodology, the quantitative approach was the most widely used, which is suitable for measuring Digital transformation's effects on variables such as audit quality or professionalism. Its strengths are that the results can be relatively generalized, while the main shortcomings are the limited depth in the behavioral and organizational aspects that may affect the adoption of digital technologies.

Section V the added value of current research and the research gap

Although previous studies have made important contributions to clarifying the relationship between digital transformation and audit quality or the development of the external audit profession, they have not directly and comprehensively addressed the impact of digital transformation on the development of the professional competence of the external auditor in Iraqi audit companies. Most of the studies focused on audit quality as a dependent variable, We discussed digital transformation in a broad sense., without a detailed analysis of the dimensions of professional competence such as digital skills, the ability to analyze data, the use of electronic audit systems, and continuous professional learning. The Iraqi environment still needs recent field studies that measure the level of adoption of digital transformation within audit companies, and the extent to which this reflects on the performance of external auditors and their professional competence. The importance of the current study integrates the variables of digital transformation and external auditor professional ability within an Iraqi field setting emphasizes its significance., which contributes to filling a clear gap in the Arabic accounting literature. The current research is expected to provide practical results that can benefit audit companies and professional entities in designing training programs, developing digital infrastructure, and enhancing the readiness of external auditors to the requirements of the modern audit environment.

3. Result and Discussion

3.1 Digital transformation in external audit

The concept of digital transformation

Digital transformation is one of the central concepts in the contemporary management literature, as it explains the fundamental changes that digital technologies bring about in business models, organizational processes, value creation and Competitiveness Enhancement. Digital transformation refers to a fundamental process of change for an organization that relies on the integration of digital technologies to bring about strategic transformations in processes, business models and organizational capabilities, enabling the creation of new value and enhancing the ability

to adapt to the changing digital environment. Digital transformation is defined as a comprehensive organizational transformation driven by digital technologies, leading to the restructuring of organizational structures, strategies and value creation mechanisms, enabling organizations to continuously adapt within digital ecosystems [4].

Objectives of digital transformation

Digital transformation aims to redesign business models and organizational processes by strategically employing digital technologies, improving operational efficiency, enhancing organizational flexibility, accelerating innovation, and creating sustainable value for customers and stakeholders. Additionally, it enables businesses to gain a sustained competitive edge and react swiftly to changes in the environment. Digital transformation focuses on enabling organizations to develop their organizational capabilities, restructure their strategies, and improve decision-making processes based on data and digital technologies. It also aims to build institutions that are more capable of continuous adaptation to technical and Market Variables, and promote the integration of technology and human resources to achieve comprehensive transformation. One of the most prominent goals of digital transformation is to improve organizational performance, increase productivity, develop services and products, raise the quality of customer experience, as well as support innovation and sustainable growth. Additionally, it helps to improve data investment and process integration., and enabling organizations to achieve higher economic and organizational value in the digital environment [5].

Digital transformation tools in auditing

The most prominent digital transformation tools used in auditing are as follows:

1. **big data and data analytics (Big Data & Audit Data Analytics)** One of the most crucial digital transformation tools for auditing is big data., as it enables the external auditor to analyze huge and diverse amounts of financial and non-financial data, whether structured or unstructured, using advanced analysis techniques instead of just testing limited samples. This helps in detecting abnormal patterns, identifying material risks, improving the evaluation of the internal control system, early detection of fraud and errors, as well as providing more comprehensive and reliable audit evidence. Data analytics also allows the implementation of continuous and real-time tests, which, in comparison to conventional techniques, improves the caliber of expert assessments and raises the audit process' efficacy and efficiency.
2. **electronic auditing (Electronic Auditing)** One of the most significant uses of digital transformation is e-audit, which depends on software, digital platforms and information systems in planning, implementing, documenting audit procedures and issuing reports. This method allows direct access to electronic databases, checking all transactions with high accuracy, implementing remote audit procedures, and continuously monitoring operations, while minimizing manual intervention and reducing the likelihood of error. Electronic auditing also contributes to raising the speed of completing tasks, improving the quality of evidence, and enhancing cooperation between the audit team and the client via cloud environments, It improves the audit process's effectiveness and adaptability in contemporary digital environments.
3. **artificial intelligence (Artificial Intelligence)** Artificial intelligence has become an essential tool in the digital transformation of auditing, as machine learning algorithms are used to analyze financial data, predict risks, detect abnormal transactions, and support professional decision-making [6]. It also helps in automating routine procedures, improving risk assessment, increasing the accuracy of fraud detection, while allowing the auditor time to focus on professional judgments and complex issues, It results in enhanced audit quality and increased professional performance efficiency.

3.2 Professionalism of the external auditor

The concept of professionalism of the external auditor.

The external auditor's level of expertise is one of the main pillars of the quality of the audit process, as it reflects his ability to employ professional knowledge, skills, experience and commitment to ethical standards to issue a reliable audit opinion. The professional competence of an external auditor is defined as the auditor's ability to employ technical knowledge, professional skills, practical experience, values and professional ethics in an integrated manner to carry out audit tasks in accordance with professional standards and achieve the expected level of performance with high quality and objectivity. The professional competence of an external auditor refers to the continuous ability to perform audit responsibilities at a specific professional level, by integrating technical competence, professional skills, values and ethics, with continuous professional development to keep pace with changes in the audit environment.

Dimensions of the professionalism of the external auditor.

We examine the following aspects of the external auditor's professional competence:

1. **Knowledge and Technical Competence** The knowledge and technical dimension refers to the external auditor's in-depth knowledge of accounting and auditing standards, relevant legislation, in addition to the ability to apply audit procedures using traditional and digital methods. This dimension also includes continuous professional development to keep abreast of organizational and technological developments, This improves the effectiveness of performing audit jobs and the caliber of professional judgments [7].
2. **Ethical and Professional Values** One of the most important aspects of an external auditor's expertise is their adherence to professional ethics, which include independence, integrity, objectivity, confidentiality, and respect for the standards of professional conduct. Studies confirm that these values represent the basis of confidence in the audit profession, and directly affect the quality of the audit process and the credibility of professional opinion, as well as enhancing the auditor's ability to make objective decisions away from pressure or conflicts of interest.
3. **Professional Skills and technology Competence** This dimension includes the auditor's possession of critical thinking skills, effective communication, teamwork, professional reporting, along with proficiency in the use of digital technologies, IT applications and data analytics. With the digital transformation, technical skills have become an essential element of professional competence, as the auditor has been able to deal with electronic environments, analyze big data, and implement audit procedures more efficiently and effectively.

International professional standards for the external auditor.

The international professional standards for the external auditor deal with the following

1. **international audit standard ISA 220 (Revised):** quality management in the audit of financial statements The ISA 220 (Revised) Standard defines the responsibilities of the audit function partner and the audit team in quality management during the implementation of the audit process, and emphasizes the need to adhere to ethical requirements, exercise professional judgment, continuously review evidence, and effectively supervise audit team members to ensure the issuance of a high-quality audit report that complies with international standards [8].
2. **international standard of quality management ISQM 1** ISQM 1 obliges audit offices and companies to establish an integrated quality management system based on the proactive identification, assessment and response to quality risks, focusing on governance, independence, human resources management, control over the execution of tasks, continuous monitoring, ensuring the improvement of the quality of external audit services and compliance with international professional standards.

3. **international audit standard ISA 315 (Revised 2019) ISA 315** (Revised 2019) focuses on the responsibility of the external auditor in identifying and assessing the risks of material misstatements through understanding the entity, its environment and the internal control system, while encouraging the application of contemporary technology and expert judgment in risk assessment and the creation of more effective and efficient audit procedures, which helps to improve the audit process' quality and the dependability of financial reporting [9].

Digital skills of the external auditor.

There are many digital skills of the external auditor, including

1. **skills of using digital technologies and data analytics** The ability to use digital technologies and data analytics is one of the most important skills that an external auditor should possess in light of digital transformation, because it makes it possible for him to examine vast volumes of data, identify anomalous patterns, extract risk indicators, and produce more precise and trustworthy audit proof. Additionally, these abilities boost the effectiveness of the audit process in digital contexts and enhance the caliber of expert judgments [10].
2. **competency skills in Information Technology** The digital skills of the external auditor include proficiency in the use of accounting information systems, electronic audit programs, databases, cloud computing, in addition to the ability to self-continuous learning to keep abreast of technical developments. Studies have shown that continuous training, accounting education and learning in the work environment are key factors in developing the technical competence of an external auditor and improving his professional performance [11].
3. **technology recruitment skills in fraud risk assessment** Digital skills associated with the use of artificial intelligence and digital tools in assessing fraud risks have become a basic requirement for an external auditor, as they help him to automatically examine data, analyze financial transactions, and detect fraud indicators more efficiently. These skills also contribute to enhancing the quality of professional decisions and raising the effectiveness of audit procedures in the digital environment [12].

The relationship between digital transformation and the professionalism of the external auditor

The adoption of digital technologies contributes to the advancement of expert knowledge and abilities, enhance the speed and accuracy of business completion, and support data-driven decision-making, which raises the level of professional performance and The caliber of services rendered. The theory of dynamic capacities is used to describe how big data analysis affects the growth of an external auditor's professional competence, which holds that organizations and individuals achieve a competitive advantage by acquiring new capabilities to absorb modern technologies and employ them in changing work environments. Big data analysis allows the external auditor to process huge and diverse amounts of data in real time, detect abnormal patterns, improve risk assessment, increase the accuracy of professional judgments, which leads to the development of technical knowledge, analytical skills, the ability to make more objective judgments, thereby enhancing the professionalism of the external auditor. The relationship between electronic auditing and improving the quality of professional performance of an external auditor is theoretically founded on the Technology Acceptance Model (TAM) idea, which postulates that people's understanding of the benefits and usability of technology boosts its adoption in the environment . In the field of auditing, electronic auditing contributes to automating audit procedures, reducing human errors, speeding up the implementation of tests, raising the efficiency of documenting evidence, improving communication with clients, This is demonstrated by the external auditor's increased accuracy in their professional performance, objectivity and efficiency in carrying out audit tasks, as well as enhancing the ability to detect errors and fraud and provide more reliable reports.

3.3 The applied aspect

Community and research sample

Employees in the audit companies under study who hold positions such as audit partner, audit manager, audit supervisor, senior external auditor, external auditor, or assistant auditor are representative of the research community because they are most relevant to the research variables and can evaluate the role of digital transformation in enhancing the professional competence of the external auditor. In order to gather reliable data reflecting the reality of practical application of research variables, the study used the deliberate sampling method, distributing 130 questionnaires to sample members, of which 120 were retrieved valid for statistical analysis [13].

Research methodology and tools

The descriptive-analytical approach was chosen for the study because it was utilized in both the theoretical and practical domains to examine the literature and prior research on digital transformation and professionalism, as well as to evaluate field data and test research hypotheses. A five-point Likert scale questionnaire that was created based on prior research and literature was used to gather the data. The data were analyzed using SPSS version 29, through descriptive statistics, the kronbach Alpha stability test, the Pearson correlation coefficient, simple linear regression and the (T) test.

The demographic distribution of the research sample

Table No. (1) shows the demographic distribution of the members of the research sample according to years of experience, educational attainment, and job nature.

Categories	Type	Number	Percentage
Years of experience	1-5 years	52	43.3 %
	6-10 years	28	23.3 %
	11-15 years	30	25.0 %
	old More than 15 years	10	8.3 %
Total		120	100 %
Educational attainment	Bachelor	66	55.0 %
	Masters	34	28.3%
	Ph. D.	20	16.7%
Total		120	100 %
Functional nature	Assistant Auditor	20	%16.7%
	External auditor	32	26.7%
	Senior external auditor	28	23.3%
	Audit supervisor	18	15.0%
	Audit partner	12	10.0%
	Audit manager	10	8.3%
Total		120	100%

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

The majority of respondents have sufficient practical experience to evaluate the effects of digital transformation in the audit environment, according to the results of years of experience, which show that the category (1–5 years) came in first place with 43.3%, followed by the category (11–15 years) with 25.0%, the category (6–10 years) with 23.3%, and the category (over 15 years) with 8.3%. Bachelor's degrees accounted for the largest percentage of educational attainment (55.0%), followed by master's degrees (28.3%) and doctorates (16.7%). This indicates the existence of different scientific levels that support the data's trustworthiness. Regarding the functional aspect, external auditors made up the largest portion (26.7%)., followed by senior external auditors (23.3%), then assistant auditors (16.7%), audit supervisors (15.0%), audit partners (10.0%), and finally audit managers (8.3%). This distribution indicates the representation of various functional levels within audit firms, This

improves the sample's comprehensiveness, boosts the outcomes' capacity to convey the truth of digital transformation activities, and advances the external auditor's professionalism.

Test of honesty and constancy (cronbach Alpha)

In order to confirm the validity of the measuring tool and its reliability for statistical analysis, the table displays the results of testing the internal consistency and constancy of the paragraphs of the study variables using the item correlation coefficient with the total and the Cronbach Alpha coefficient.

Table (2) results of the test of constancy and internal consistency of the paragraphs of the study variables

Phrases: The use of big data analysis in the development of the professionalism of the external auditor	**Kronbach's correlation coefficient and item-sum correlation coefficient**	**Phrases The use of electronic audit in improving the quality of professional performance of the external auditor**	**Kronbach's correlation coefficient and item-sum correlation coefficient**
X1	0.864	Y1	0.881
X2	0.847	Y2	0.869
X3	0.873	Y3	0.894
X4	0.885	Y4	0.878
X5	0.891	Y5	0.902
X6	0.879	Y6	0.886
X7	0.858	Y7	0.875
X8	0.888	Y8	0.890
Cronbach Alpha Coefficient	0.918	Cronbach Alpha Coefficient	0.931

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

For the large data analysis axis, the item's correlation coefficients with the total ranged from 84.7% to 89.1%. These high values above the statistically admissible limit of 30%, indicating that all paragraphs are consistent with the axis to which they belong. The item's correlation coefficients with the e-audit axis total varied from 86.9% to 90.2%., which are high values reflecting the strength of internal consistency between paragraphs. The value of the cronbach's Alpha coefficient for the first axis was 91.8%, and for the second axis it was 93.1%, which is higher than (0.70), It suggests that the study tool has a very high level of stability and dependability. All of the study's variables and paragraphs have a strong correlation.; the coefficients of the item's correlation with the total were all high and positive, which indicates that the paragraphs measure the same dimension well. Additionally, the strong Cronbach's alpha values show that the study instrument measured what it was intended to measure and had a high level of internal consistency and stability, making it appropriate for use in statistical analyses and hypothesis testing.

Table (3) alpha cronbach coefficient for measuring resolution stability

Variables	**Cronbach Alpha Coefficient**
The use of big data analysis in the development of the professionalism of the external auditor	0.918
The application of computerized auditing to enhance the external auditor's professional performance	0.931
The questionnaire as a whole	0.945

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

The table's findings show that all the values of the cronbach's Alpha coefficient exceeded the statistically acceptable minimum (0.70), reaching 0.918 for the axis of using big data analysis, and

0.931 for the axis of using electronic auditing, while the value of the cronbach's Alpha coefficient for the questionnaire as a whole reached 0.945, which is a very high value indicating that the study tool has an excellent degree of stability and internal consistency . Accordingly, the resolution has high reliability, and its data can be relied on in testing study hypotheses and conducting various statistical analyzes.

Descriptive analysis of search variables

A. **there is a statistically significant impact of the use of big data analysis in the development of the professional competence of the external auditor** The table displays the findings of the descriptive analysis of the paragraphs on the axis of the use of big data analysis in the development of the external auditor's professionalism using the arithmetic mean, standard error, standard deviation, and the relative significance of figuring out the respondents' response level.

Table (4) descriptive statistics on the use of big data analysis in the development of the professional competence of the external auditor

Paragraphs	questionnaire paragraphs	arithmetic mean	standard error	standard deviation	relative importance
1	The use of tools for collecting and extracting big data contributes to the development of the auditor's ability to efficiently obtain audit data from multiple electronic sources.	4.28	0.067	0.73	85.60
2	The use of techniques for collecting and extracting big data enhances the auditor's skill in dealing with electronic accounting databases and systems during the execution of the audit process	4.31	0.064	0.70	86.20
3	Using big data analysis helps auditors become more adept at managing and cleaning data to guarantee the quality of data used in audit operations	4.36	0.061	0.67	87.20
4	The use of big data analysis techniques helps to detect and correct incomplete or inconsistent data before starting the analysis process	4.24	0.069	0.75	84.80
5	Big data analysis improves the auditor's capacity to to make more accurate professional judgments by providing comprehensive and reliable audit evidence	4.47	0.056	0.61	89.40
6	Utilizing big data analysis outcomes enhances the auditor's capacity to assess	4.42	0.058	0.63	88.40

	risks and make appropriate professional decisions during the implementation of the audit process				
7	The application of big data analysis encourages the further development of the auditor's digital skills to keep pace with the digital transformation and modern technologies in the audit profession	4.33	0.063	0.69	86.60
8	The use of data visualization and interactive reporting tools contributes to the development of the auditor's ability to clearly present audit results that support the quality of professional reports.	4.39	0.060	0.66	87.80
The general rate of the paragraphs of the first axis		4.35	0.062	0.68	87.00

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

As the overall arithmetic average of the axis reached (4.35 out of 5) and the relative importance reached (87.00%), the results of the descriptive analysis show that the respondents showed a high level of agreement towards the paragraphs of the axis of using big data analysis in developing the professional competence of the external auditor [14]. This indicates a high awareness of the importance of applying big data analysis techniques in developing the professional competence of external auditors. While the standard error reached (0.062), the total standard deviation also reached (0.68), a rather low level that shows a clear homogeneity and convergence in the respondents' thoughts about the paragraphs of this axis, which reflects the stability and accuracy of the arithmetic averages. At the level of paragraphs, With an arithmetic average of 4.47 and relative importance of 89.40%, the fifth paragraph came in first, indicating that most respondents concur that big data analysis improves the auditor's capacity to make more accurate professional judgments by providing comprehensive and reliable audit evidence, It highlights how crucial these methods are to raising the caliber of professional work and boosting the accuracy of audit findings. The sixth paragraph also ranked second with an arithmetic average (4.42) and relative importance (88.40%), which confirms the importance of the results of big data analysis in improving evaluating risks and making wise professional choices while carrying out the audit process. On the other hand, the fourth paragraph recorded the lowest arithmetic mean (4.24), However, its relative importance reached 84.80%, a significant figure that validates respondents' ongoing agreement on the significance of employing big data analytic techniques to identify and fix inconsistent or missing data. In general, The first sub-hypothesis, which states that there is a statistically significant impact of using big data analysis in developing the professional competence of the external auditor, is supported by the results, which show a strong positive trend among the respondents regarding the importance of using big data analysis in developing the professional competence of the external auditor [15]. It also shows that the use of these technologies contributes to improving the quality of audit

procedures, improving decision-making efficiency, and raising the level of reliance on electronic audit evidence, in keeping with the demands of the audit profession's digital transformation.

B. **there is a statistically significant impact of the use of electronic audit in improving the quality of professional performance of the external auditor**. Using the arithmetic mean, standard error, standard deviation, and relative importance of evaluating the respondents' trends, the table presents the findings of the descriptive analysis of the paragraphs of the axis of the use of electronic auditing in improving the quality of professional performance of the external auditor.

Table (5) descriptive statistics of the use of e-audit in improving the quality of professional performance of the external auditor

Paragraphs	questionnaire paragraphs	arithmetic mean	standard error	standard deviation	relative importance
1	The use of electronic audit software contributes to improving the efficiency of carrying out audit procedures by automating routine tasks and minimizing manual intervention	4.38	0.060	0.66	87.60
2	The use of electronic audit software helps to increase the comprehensiveness and accuracy of audit procedures when examining financial statements and transactions	4.42	0.058	0.64	88.40
3	The analysis of electronic data contributes to improving the quality of professional judgments by providing more comprehensive and reliable audit evidence	4.47	0.055	0.61	89.40
4	The use of electronic data helps to strengthen the auditor's ability to make more accurate and objective audit decisions when evaluating audit results	4.40	0.059	0.65	88.00
5	The use of electronic data analysis tools and anomaly tests contributes to an increase in the auditor's ability to detect material errors and indicators of fraud	4.51	0.053	0.58	90.20
6	The use of electronic risk assessment and Control tools improve the auditor's capacity to recognize high-	4.46	0.056	0.61	89.20

	risk areas and improve the efficiency of audit procedures				
7	The use of electronic evidence management systems reduces the time and effort required to document and review audit evidence while maintaining the quality of work	4.36	0.062	0.68	87.20
8	The preparation of electronic reports helps to improve the speed of completion of the audit process and the quality of professional reports provided to its users	4.44	0.057	0.63	88.80
The general rate of the paragraphs of the second axis		4.43	0.058	0.63	88.60

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

As the total arithmetic average of the axis reached (4.43) out of five scores and the relative importance reached (88.60%), the descriptive analysis results show that there is a high degree of agreement among the respondents regarding the role of using e-audit in improving the quality of professional performance of the external auditor [16]. This indicates a high awareness of the importance of applying e-audit tools and techniques in developing professional performance and raising the quality of audits. Additionally, the overall standard deviation reached a comparatively low level of 0.63, indicating a high degree of homogeneity and convergence of the respondents' responses., while the standard error reached (0.058), which reflects the stability and accuracy of the arithmetic averages. At the level of paragraphs, With an arithmetic average of 4.51 and relative importance of 90.20%, the fifth paragraph ranked highest, indicating that most respondents concur that the usage of computerized data analysis tools and anomaly tests contributes significantly to the detection of fundamental errors and indicators of fraud, This improves the audit process's quality and boosts the accuracy of its findings. With an arithmetic average, the sixth paragraph was ranked second. (4.46) and relative importance (89.20%), stressing the importance of risk assessment and electronic control tools in identifying high-risk areas and improving the efficiency of audit procedures. Additionally, the third paragraph displayed a high average of 4.47, reflecting the respondents' conviction that the analysis of electronic data contributes to improving the quality of professional judgments by providing more comprehensive and reliable audit evidence. The seventh paragraph recorded the lowest average of (4.36), however, its relative value reached 87.20%, a significant figure that demonstrates respondents' ongoing agreement with the significance of electronic evidence management systems in reducing the time and effort required to document and review audit evidence. In general, the results confirm that all paragraphs achieved high arithmetic averages and relative importance exceeded (87%), It illustrates the respondents' favorable trend toward the use of electronic auditing to raise the caliber of the external auditor's professional performance [17]. Consequently, the findings corroborate the second sub-hypothesis, which claims that using e-audit has a statistically significant effect on raising the external auditor's level of professional competence, as e-audit applications contribute to enhancing the accuracy of procedures, raising the efficiency of risk assessment, enhancing the caliber of audit evidence and expediting audit work completion in accordance with the demands of the audit profession's digital transformation.

Testing and analysis of search variables

A. Testing the first hypothesis

The results of evaluating the first hypothesis using a test (One-Sample T-Test) to confirm the existence of a statistically significant effect of employing big data analysis in the growth of the external auditor's professionalism based on the study data are displayed in the table.

Table (6) outcomes of the initial hypothesis test using the One-Sample T-Test

Statistical indicators	Estimated parameters
Arithmetic mean	4.35
Standard deviation	0.68
Standard error	0.062
Differences of means	1.35
Degree of freedom	119
(T-Test) Tabular	1.980
Hypothetical arithmetic mean	3.00
(T-Test) calculated	21.82
Moral significance	0.000
The decision	accept the hypothesis

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

The arithmetic mean of the variable of using big data analysis in developing the professional competence of the external auditor was (4.35), according to the results of the (One-Sample T-Test) Test. This is higher than the hypothetical arithmetic mean of (3.00) with a difference of (1.35), reflecting the high level of approval of respondents on the paragraphs of this axis [18]. The standard deviation (0.68) and the standard error (0.062) were also reported, which indicates the homogeneity of the respondents ' responses and the accuracy of the average estimate. The calculated value of (T) was (21.82), which is greater than the tabular value (1.980) at a degree of freedom (119) and the moral significance value (Sig.=0.000), which is less than the significance level (0.05). Therefore, it rejects the nihilistic hypothesis and accepts the alternative hypothesis that there is a statistically significant impact of using big data analysis in the development of the professional competence of the external auditor, which confirms the positive role of the application of big data analysis techniques in enhancing the efficiency of external auditors.

B. Testing the second hypothesis

The table displays the findings of a test (One-Sample T-Test) used to confirm the statistical significance of the average responses of respondents in order to test the hypothesis that the use of electronic auditing improves the quality of professional performance of an external auditor.

Table (7) results of the hypothesis test: there is a statistically significant effect of the use of electronic audit in improving the quality of professional performance of the external auditor

Statistical indicators	Estimated parameters
Arithmetic mean	4.43
Standard deviation	0.63
Standard error	0.058
Differences of means	1.43
(T-Test) calculated	27.05
Degree of freedom	119

Hypothetical arithmetic mean	3.00
(T-Test) Tabular	1.980
Moral significance	0.000
The decision	accept the hypothesis

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

The arithmetic mean of the variable of using electronic auditing to improve the quality of professional performance of the external auditor was (4.43), which is higher than the hypothetical arithmetic mean of (3.00), with a difference of (1.43) averages, according to the results of the One-Sample T-Test, reflecting the high level of agreement among respondents on the importance of using electronic auditing in improving professional performance. The standard deviation (0.63) and the standard error (0.058) also reached, indicating the closeness of the respondents ' responses and the high degree of homogeneity between them. The computed T-Test value was (27.05), which is greater than the tabular value (1.980) at a degree of freedom (119), and the moral significance value was (0.000), which is less than the significance level (0.05). These results show that the use of electronic auditing has a statistically significant impact on the external auditor's professional performance. Accordingly, the research hypothesis accepts and rejects the nihilistic hypothesis, which is in line with the findings of the study's descriptive analysis of the axis [18], [19].

To examine the link between research variables, use correlation analysis.

The table displays the analysis's findings,of the Pearson correlation coefficient to measure the strength and direction of the relationship between the dimensions of digital transformation and the professionalism of the external auditor, checking the significance of statistical relationships between the study variables.

Results of the Pearson correlation coefficient analysis between research variables are shown in Table (8).

Variables	**correlation coefficient (Pearson r)**	**level of significance (Sig.)**	**The nature of the relationship**	**decision**
The use of big data analysis in the development of the professionalism of the external auditor	0.812	0.000	Strong and statistically significant positive correlation	accept the hypothesis
The application of computerized auditing to enhance the external auditor's professional performance	0.846	0.000	A very strong and statistically significant positive correlation	accept the hypothesis
The impact of digital transformation on the development of the professional competence of the external auditor	0.829	0.000	Strong and statistically significant positive correlation	Acceptance of the main hypothesis

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

The results of the Pearson correlation coefficient research show that the external auditor's professionalism and the aspects of digital transformation have strong and statistically significant positive correlations. The correlation coefficient between the use of Big Data Analysis and professional competence reached (0.812) at an indicative level (0.000), which indicates a strong direct relationship confirming that increased reliance on Big Data Analysis contributes to the development of the external auditor's professional proficiency. The correlation coefficient between the use of e-auditing and professional competence also reached (0.846), which is the highest correlation coefficient, indicating that e-auditing represents the dimension most closely related to improving professional performance [20]. Regarding the degree of digital transformation as an independent variable overall, the correlation coefficient reached (0.829) at an indicative level (0.000), which confirms a strong positive relationship between digital transformation and the development of the professional competence of the external auditor. Since all the values of the moral significance came less than (0.05), the statistical relationships are considered moral, which supports the acceptance of research hypotheses and confirms The proactive contribution of digital transformation to improving external auditors' professionalism.

Regression analysis

The table shows the results of a simple linear regression analysis to measure the impact of the dimensions of digital transformation on the development of the professional competence of the external auditor, determine the significance of the model and the strength of the influence of The dependent variable's independent variables.

Table (9) results of a simple linear regression analysis to test the impact of digital transformation on the development of the professional competence of the external auditor

Variables	R	R^2	Calculated F	β (Beta)	Calculated T	Sig.	decision
Using big data analysis	0.812	0.659	228.47	0.812	15.12	0.000	There is a moral effect
Use of electronic audit	0.846	0.716	297.83	0.846	17.26	0.000	There is a moral effect

Considering the analysis's findings, the researcher used the SPSS v29 software to construct the table.

The results of a simple linear regression analysis indicate a positive and moral effect of both the use of Big Data Analysis and the use of electronic auditing in the development of the professionalism of an external auditor. The coefficient of correlation (R) was 0.812 for the big data analysis variable, and explained 65.9% of the variance in the dependent variable, while the calculated F value was 228.47, and the calculated T value was 15.12 at the level of 0.000 significance, which confirms the model's significance [21]. Additionally, the findings demonstrated that the application of electronic auditing achieved a higher correlation coefficient of 0.846, and explained 71.6% of the variance in professional competence, with an F value of 297.83 and a T value of 17.26 at the 0.000 significance level. These results indicate that electronic auditing was the most influential compared to Big Data Analysis, and that these aspects greatly improve the external auditor's professional competence, supporting the research hypothesis about how the digital transformation affects the evolution of the external auditor's professional performance.

Discussion of the results

The main hypothesis and the two sub-hypotheses were clearly supported by the study's applied aspect results, which demonstrated a statistically significant positive impact of digital transformation on the growth of the professional competence of the external auditor in Iraqi audit companies [22]. The results of the T-Test showed that the average responses of the respondents came

higher than the hypothetical average, has a significant (Sig = 0.000), and the correlation analysis's findings also demonstrated the presence of robust positive relationships. between the study variables, as the correlation coefficient between the use of Big Data Analysis and professional competence (r = 0.812), between the use of electronic auditing and professional competence (r = 0.846), while the correlation coefficient between digital transformation as a whole and professional competence (r = 0.829). The results of the regression analysis also showed that electronic auditing was the most influential in professional competence, as it explained (71.6%) of the variation in the dependent variable, compared to big data analysis, which explained (65.9%) of the variation. These results confirm the validity of the research hypotheses and objectives, as the research succeeded in proving that the use of digital transformation tools directly contributes to the development of the professional competence of the external auditor, and the goal of measuring the impact of Big Data Analysis and the goal of evaluating the impact of electronic audit in improving professional performance was achieved [23]. The high arithmetic averages and the relative importance of the two axes indicate that the respondents are aware of Digital technologies are essential for raising the standard of professional practice in Iraqi audit businesses. The present study's conclusions are in line with the research's earlier findings, as they are in line with the investigation of, which confirmed that digital transformation enhances the professional specialization and technical capabilities of the external auditor, as well as agreed with the study of, which proved that digital technology raises the quality of audit and accuracy of examination. The results also came in line with the, which showed that digitization develops procedures for collecting and analyzing evidence, and with the, which emphasized the significance of education and training for the accomplishment of digital transformation, in addition to its compatibility with the , which indicated that digital transformation improves audit efficiency and the quality of financial reports, with the need for auditors to have advanced digital skills [24]. However, the current study was distinguished by its focus on the Iraqi environment and its direct link between digital transformation and the professionalism of the external auditor, which represents a scientific addition that fills a clear gap in the Arabic literature. The results can be explained scientifically based on the dynamic capabilities Theory, which assumes that the possession and development of digital capabilities increases performance efficiency and gives individuals and organizations a competitive advantage, which explains the positive impact of big data analysis in enhancing analytical skills, improving risk assessment, and raising the quality of professional judgments. The stronger impact of electronic auditing can also be explained in the light of the technology acceptance model (TAM), as the ease of using electronic systems and realizing their benefits increases their adoption, which is reflected in the speed of implementation of audit procedures, reducing human errors, and raising the caliber of expert reports and evidence. The scientific importance of the study is highlighted in providing a modern field guide that supports the literature that dealt with the impact of digital transformation in the audit profession, This further advances our understanding of the external auditor's professional competence. in the Iraqi environment. In practice, the results provide a basis for decision makers in audit companies and professional bodies to expand investment in digital infrastructure, and adopt specialized training programs in Big Data Analysis and electronic auditing, it improves the audit's quality services and raises the competitiveness of Iraqi audit companies [25]. The study did not show fundamentally unexpected results, but the superiority of e-audit over big data analysis in terms of impact strength is an important indicator, which can be explained by the fact that e-audit programs have become more widespread and easy to apply within audit firms compared to big data analysis techniques that require advanced technical architecture, the availability of integrated databases, and specialized analytical expertise. As for the limitations of the study, it is limited to the Iraqi audit companies classified (A) during 2026, and its reliance on the analytical descriptive approach and questionnaire data only, It might make it more difficult to extrapolate the findings to all audit contexts. or over different time periods. The study also did not address intermediate or modified variables such as organizational culture, administrative support, or readiness of the technological structure, which could be the subject of future studies.

4. Conclusion

This study examined the impact of digital transformation on the professional competence of external auditors in Iraq and found a statistically significant positive relationship between digital transformation and auditors' professional competence. The findings indicate that the adoption of digital technologies, particularly e-audit systems and big data analytics, significantly enhances auditors' ability to assess risks, analyze complex data, make informed professional judgments, and improve the effectiveness and efficiency of audit processes. Among the dimensions examined, e-audit demonstrated the strongest influence on professional competence, while the high level of adoption of digital transformation tools among respondents reflects growing awareness of their importance within the auditing profession. The study further shows that technological investment alone is insufficient to achieve sustained professional competence; it must be accompanied by continuous professional training, digital skills development, and improvements in the technological infrastructure of audit firms. These findings contribute empirical evidence from the Iraqi context and help address a gap in the Arabic auditing literature. Accordingly, audit firms and professional bodies should strengthen training programs in big data analytics, e-auditing, and artificial intelligence, invest in modern digital audit systems and secure technological infrastructure, and enhance collaboration with universities and professional organizations to align educational and professional development initiatives with international standards. Future research should examine the effects of emerging technologies such as blockchain, artificial intelligence, and machine learning on audit quality and professional competence, while employing advanced analytical approaches, including structural equation modeling, to investigate the influence of organizational culture, technological readiness, and managerial support on the relationship between digital transformation and external auditors' professional competence.

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