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THE ROLE OF ACCOUNTING INFORMATION SYSTEMS IN ADVANCING DIGITAL TRANSFORMATION AND ENHANCING INTERNAL AUDIT QUALITY: A CASE STUDY OF RAFIDAIN BANK

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ABSTRACT

In this article, we present a field study examining auditing practices in Iraqi banks. To ensure the study is data-driven, we selected Rafidain Bank as a case study. Given the global digital transformation, particularly within the financial sector, it was essential to investigate its impact on internal auditing practices at Rafidain Bank. Banks and the financial sector have adopted a digital transformation strategy across all facilities, utilizing applications and implementing digital financial transactions. This trend has had an impact through accounting information systems, which have been digitally integrated into the development of internal auditing. Our study involved conducting field interviews with banking sector employees (specifically Rafidain Bank), employing a rigorous and sequential research methodology. Our research significantly contributed to understanding the readiness of banks' infrastructure for digital transformation. The impact of implementing accounting systems was evident in facilitating the understanding of the necessary elements for achieving banking objectives, namely maintaining banking value and streamlining banking operations. Technologies such as artificial intelligence, data analytics, or other technologies such as blockchain contribute to supporting and facilitating the digital transformation process and positively impacting internal audit practices.

KEYWORDS: *Accounting Information Systems; Digital Transformation; Internal Audit; Rafidain Bank; Blockchain.*

1. INTRODUCTION

Recent developments in digital technologies, such as blockchain and distributed ledger technologies, have attracted a lot of attention from academicians due to the potential of these technologies in revolutionizing the accounting and audit process. The nature of blockchain technology, being immutable, decentralized, and transparent, has the potential to disrupt the traditional accounting process (Kupenova et al., 2022). According to the literature, the potential of this technology in significantly reducing the incidence of fraud and material misstatement, thereby increasing the level of confidence among stakeholders, is quite high, and the audit process can also be significantly streamlined (Sharma et al., 2024). Further, the introduction of smart contracts has the potential to automate complex financial transactions, thereby increasing the level of compliance with regulatory norms in an efficient manner (Patak et al., 2024).

Along with blockchain-based technologies, other digital innovations such as cloud computing platforms, big data analytics, and artificial intelligence have also been found to significantly enhance the analytical capabilities and decision-making performance of accountants (Xin et al., 2024). These technologies contribute to improving the accuracy, consistency, and timeliness of accounting information, which subsequently strengthens the effectiveness of corporate governance systems (Almasria et al., 2024). However, internal auditing processes in banks still largely rely on traditional manual approaches, which are widely viewed as time-consuming, inefficient, and prone to errors (El-Sayed et al., 2023). In addition, conventional auditing techniques are considered limited in scope, potentially allowing fraudulent activities and unethical business practices to remain undetected. The lack of real-time auditing can negatively impact a bank's overall performance and may pose a serious risk to its long-term organizational sustainability (Zhang et al., 2024).

In the context of the digitalization of the corporation, accounting is considered a continuous and systematic process of gathering, measuring, processing, and reporting information. The improvement of the performance of the accounting system as an information system, with its foundation being financial accounting, consists of generating information as financial reporting and management reporting, providing financial and non-financial information to internal users of the information provided reliably, and providing information transparently, thereby facilitating access to information concerning the economy and finance. The most important qualitative characteristics of the accounting system, as an international language of business and finance, are enhancing the information provided with its usefulness and comparability with regard to the reporting of different entities.

One of the modern digital challenges in the practice of auditing is the delivery of digital services. In the last few years, the issue of digital transformation, particularly in its considerable impact on the fields of accounting and auditing, has been gaining more and more interest, which has, in turn, highlighted the need to educate in this area (Pourali Laklaei & Faramarzi Kangerlouei, 2023). In these circumstances, digital technologies play a role in addressing the challenges connected with the improvement of accounting information systems to meet the information needs of relevant stakeholder groups.

For instance, during the First Gulf War, the bank encountered significant losses. Moreover, the bank's branch in London was closed in 1990 following international sanctions. Nevertheless, Rafidain Bank has continued to operate and remain a pillar in the banking system of Iraq and internationally. With almost half of the country's banking market asset size, the bank is in the process of digitalization in all aspects of banking.

Currently, the internal auditing process at Rafidain Bank remains outdated and time-consuming, as it depends on auditing records and documents in a traditional form. However, such a process is not only time-consuming and costly in terms of human resource utilization, as it can lead to errors and document forgery. Since banks are now at the frontlines in terms of digital revolution, Iraqi banks can improve their financial and accounting system with the use of technology to remain competitive in a dynamic business environment. However, what remains to be seen is how to utilize technology to a greater advantage to achieve business knowledge in order to make better management decisions.

Theoretical Literature and Research Background

Bank management seeks to provide accounting information that is transparent, reliable, and cost-effective. In the future, the integration of digital technologies is expected to lead to more reliable banking data and more efficient financial markets. The primary reasons for adopting digital technologies in corporate lending include eliminating human error, increasing operational efficiency, limiting manipulation, and reducing fraud in accounting and auditing records, while simultaneously saving time and costs (Purk & Lee, 2021). However, some have proposed that the proper application of digital technology may help improve the quality of accounting information, which is utilized during the financial reporting process. Digital transformation is capable of improving the quality and timeliness of accounting information, which is more reliable and better than traditional accounting and auditing practices (Kokina et al., 2017).

Several studies have been done on the role played by digital technologies in the banking and auditing sectors. For instance, Issa et al. (2016) carried out studies to examine the impact of digitalization on the audit institution's risk assessment and efficiency. Brown-Liburd et al. (2015) examined the impact of digital

technologies on audit judgment quality. New digital technologies and data analytics have been increasingly incorporated into internal audit functions. However, independent audit firms have not kept pace with the adoption of innovative technologies. According to prior research, the implementation of audit engagement standards by internal auditing has significantly contributed to the effectiveness of the audit. Moreover, compliance with professional standards was established as the most significant factor influencing value creation in internal auditing. Quality, in this case, means that the auditors have to fulfill the basic requirements set by auditing standards. On the other hand, the availability of qualified staff within the internal audit unit, coupled with the management of such staff, was established as a key driver of internal audit performance. Auditing, as a practice, requires professional staff with the required education, training, and experience, and the required professional competencies to conduct a wide range of audit engagements required. Moreover, the auditors have to comply with the minimum professional education and the professional standards set by the relevant professional bodies and the Institute of Internal Auditors (Purwohedi, Memon, & Zakaria, 2020).

During the digital transformation process, studies on the impact of digital technologies on accounting and the implications on the quality and effectiveness of internal auditing are introduced and analyzed. In addition, research on internal auditing in the banking system is reviewed to clarify existing findings, identify research gaps, and establish the foundation for the present study.

Schiavi et al. (2024) stated that the purpose of their study was to clarify digital transformation in the accounting domain from an institutional change perspective. Using a quantitative approach, data were classified through the latent semantic analysis (LSA) technique, and a systematic literature review was conducted to examine how institutional change can be applied to accounting information systems (AIS) research. In addition, a qualitative approach based on hierarchical content analysis was employed as a foundation for inference. In this study, 309 articles applying institutional theory in accounting and AIS were examined.

Bank management wants to ensure that accounting information is clear, dependable, and cost-effective. However, in the future, it is believed that there will be more dependable banking data and more efficient financial systems due to the integration of digital technology. The main motives that lead banks to use digital technology in corporate lending include eliminating human error, increasing efficiency, controlling manipulation, and preventing fraud in accounting and auditing records, in addition to saving time and costs (Purk & Lee, 2021). Some researchers have suggested that using digital technology appropriately will improve the quality of accounting information used in financial reporting practices. Digital transformation has immense potential to improve accounting information reliability and efficiency in terms of offering a superior choice over traditional accounting and auditing practices (Kokina et al., 2017).

Several studies have been done on the impact of digital technologies on banking and auditing. For instance, Issa et al. (2016) carried out studies to examine the impact of digitalization on the assessment of risk and efficiency in audit institutions. Another study done by Brown-Liburd et al. (2015) focused on the impact of these technologies on the quality of audit judgment. The application of the latest digital technologies in internal audit has been on the increase. On the other hand, the application of these technologies in independent audit firms has not kept pace.

Based on previous studies, the execution of audit engagements based on the standards applicable to the field of internal auditing was found to contribute significantly to the efficiency of auditing. Moreover, compliance with professional standards was found to be the most critical factor affecting the creation of value within the field of internal auditing. Quality, within this scope, entails the satisfaction of the basic requirements mentioned within the auditing standards. Lastly, the presence of qualified employees within the unit responsible for the field of internal auditing, combined with the management of the employees, was found to be one of the critical factors affecting the efficiency of the auditing. For auditing, professional employees are needed, who, on the one hand, possess the appropriate education, training, experience, and professional competencies needed to execute the many auditing engagements that are necessary. For the execution of their responsibilities, the auditors are obligated to satisfy the standards on continuing professional education, professional standards, applicable professional bodies, and the standards mentioned within the publications by the Institute of Internal Auditors.

As a result of the digital transformation process, studies that address the impact of digital technology on accounting, as well as the implications of this impact on the quality and effectiveness of internal audit, are introduced and analyzed. In addition, studies that address internal audit in the banking system are analyzed in order to understand the existing knowledge, the gaps, and the foundation of the present study.

Schiavi et al. (2024) asserted that the objective of their research was to "provide a clear understanding of the concept of digital transformation in the accounting domain from an institutional change perspective." Within this realm of inquiry, another study by Balika (2023) focused on the potential offered by the latest digital technologies in terms of the improvement of the performance of Accounting Information Systems (AIS) in supporting managerial decision-making processes, with special reference to the application of artificial intelligence. The aim of the study was to reveal the ways in which the latest digital technologies could enhance the performance of AIS. The study revealed that there is a considerable level of predictive accuracy, with the average error rate being below 3%, through the application of the Long Short-Term Memory model. The theoretical and practical outcomes of the study are consistent with the strategic role of digital technologies in enhancing the performance of AIS. Another study by Nabilou (2023) examined the influence of the implementation of modern AIS on audit quality and organizational performance. The study revealed that there are statistically significant relationships between the implementation of modern AIS and organizational performance, as well as between the implementation of AIS and audit quality. Moreover, the study revealed that some of the elements of modern AIS are considered reliable indicators of audit quality and organizational performance.

In their study, the authors used a quantitative method of data classification, which is based on latent semantic analysis, and also combined this with a literature review to determine the role of institutional changes in the study of accounting information systems. Moreover, a qualitative method of data analysis, which is based on hierarchical content analysis, was used for inference in this study. A total of 309 articles were used in the study, which focused on the application of institutional theory in the study of accounting and information systems. Al Shanti and Elessa (2023) focused on examining the impact of digital transformation in enhancing the quality of accounting information and corporate governance in the banking sector, with emphasis on blockchain technology. From the study, it is evident that digital transformation has a positive and significant impact on the quality of accounting information. Moreover, the study indicates the need for organizations to adopt digital transformation in order to maximize the benefits of blockchain technology Mohammadi Noura et al. (2021).

Most of the international research highlighted the significance of digital technologies, accounting information systems, in terms of their influence on the quality of financial information, managerial decisions, and internal auditing Pourali Laklaei et al. (2023). Most of the domestic research highlighted the significance of the relationship between accounting information systems, the quality of internal auditing, and organizational performance. Most of the prior research was focused either on accounting information systems or mainly highlighted traditional factors that influence the effectiveness of internal auditing. In this regard, this research, which places its focus on one of the biggest state-owned commercial banks in Iraq, i.e., Rafidain Bank, aims to explore and examine the influence of digital innovation on the process of internal auditing, specifically in terms of identifying the opportunities, challenges, and implications that relate to accounting information systems and blockchain technology. Based on the analysis of the research background, the following conclusions pertain to the content of the preceding research. Most prior research concentrated on the influence of accounting information systems, digital transformation, and organizational factors on the efficacy of internal auditing. Moreover, this research aims to explore and examine the different aspects of this phenomenon with the aim of establishing its significance in terms of its contributions to the quality of internal auditing, communicability, added value, and execution of certain audit practices. Therefore, in terms of its objectives, it is safe to state that this research aims to contribute to providing useful insights that will enhance and improve the supervisory framework of Rafidain Bank, specifically in an era of technological innovation.

Research Methodology

The present study has been implemented with an application of qualitative study with a grounded theory approach. A sequential exploratory study has been used to offer in-depth explanation about Rafidain Bank's

real-world experience with regard to its digital transformation journey and implications on internal auditing. For conducting the study, the population has been identified as chief executive officers, board members, senior managers, internal auditors, and academic experts with regard to digital technology and accounting. Purposive sampling with a snowball sampling approach has been used to identify knowledgeable individuals. For data collection purposes, in-depth interviewing, participant observation, and relevant document analysis have been used. For ensuring data validity, triangulation has been used as a data analysis approach. For ensuring reliability in conducting a study, participant validation and peer review by relevant specialist individuals have been used. For data analysis purposes, three coding methods have been used to develop a paradigmatic model with regard to data analysis. For ensuring ethical clearance in conducting a study, confidentiality, seeking permission, and upholding academic integrity have been used as a data analysis approach.

Table 1. Reliability Calculation

Row	Interview Title	Total Number of Codes	Number of Agreements	Number of Disagreements	Test-Retest Reliability (%)
1	Interview No. 3	36	12	6	0.66
2	Interview No. 7	26	9	5	0.69
3	Interview No. 10	18	6	3	0.66
Total	—	80	27	14	0.67

As indicated in Table 1, the total number of codes at two points of time within an interval of 15 days was found to be 80, with the total number of agreements being 27 and the total number of disagreements being 14. The reliability of the interviews conducted during the test and re-test of the instrument was calculated at 67% with the help of the given formula. As most of the reliability coefficients were found to be above 0.70, the reliability of the instrument was considered acceptable, reflecting an acceptable level of internal consistency between the variables included within the instrument.

Table 2. Reliability Calculation for the Quantitative Section

Variable	Cronbach's Alpha
Strategic Conditions	0.900
Contextual Factors	0.917
Causal Factors	0.858
Intervening Factors	0.879
Core Category	0.822
Outcomes	0.891

The data analysis process of the qualitative section involved the theoretical coding method, as derived from grounded theory methodology. Data analysis of the data collected in this study involved separate analysis of the data collected. More specifically, analysis of the qualitative data involved a process of open, axial, and selective coding, as well as the respective methodologies of each of those processes, towards the ultimate construction of the research model. Upon construction of the questionnaire based on the developing theory, the validity of the constructed model is determined via the Delphi method.

Findings

In this section, the characteristics of the research sample are presented by position, field of study, level of education, and area of activity. In this study, interviews were conducted with 15 participants until theoretical saturation was achieved. Following these interviews, the researcher and the research team concluded that the collected information had reached saturation and that additional interviews were unnecessary. The second stage of data coding corresponds to axial coding. At this stage, categories are linked into an interconnected network. In the course of the analysis, the researcher identifies many initial codes. A critical issue at this stage

is that the codes have to be basic; that is, related phenomena must be grouped. Otherwise, the analysis becomes complicated by the large number of concepts without any particular direction. Once the particular phenomenon is recognized, the concepts can be grouped around the phenomenon. This reduces the number of concepts that have to be considered. The process of classifying the concepts that appear related to particular phenomena is referred to as categorization. Next, the conceptual name for each category representing the particular phenomenon is developed, which has to be more abstract than the initial conceptual names (Charmaz, 2006). In fact, this stage represents the most abstract level of coding, through which the relationships among the developed categories are articulated. To achieve the desired integration at this stage, the researcher must define the core phenomenon and remain committed to it. The outcome of this stage is the development of a theory. Friedman (1999) regarded theory as an organizing framework that allows similar data to be used to predict and explain empirical events. Others have viewed theory as a substitutable hypothesis. These perspectives are largely rooted in quantitative and empirical paradigms; however, within a qualitative perspective, theory can be understood as a process of conceptualization (as cited in Flick, 2002). In this section, axial codes were integrated in a composite manner, and the content of each was organized within the theoretical code framework.

Table 4. Axial Coding of Causal Conditions Affecting Digital Innovation in Internal Auditing

Key factors	Main category	Subcategory
- Weak AI infrastructure - Limited intelligent analytics software - Poor data integration - Inadequate technical support - Lack of processing equipment - Cost-cutting measures	Technological infrastructure	Infrastructure development
- Limited data analysis skills - Resistance to smart technology - Lack of knowledge of machine learning algorithms - Need for specialized training - Low organizational acceptance of technology	Auditor competencies	Skills and attitudes
- Limited management support for artificial intelligence - Insufficient funding for smart technology - Weak management involvement in digital transformation	Administrative support	Leadership and Finance
- Resistance to technological change - Positive attitudes towards digital learning - The importance of knowledge sharing - Supporting creativity and experimentation	Organizational culture	Learning and Innovation
- Increased competitive pressure - Stricter regulations - High customer expectations for intelligent analytics - Global shift in analytics tools	External requirements	professional and organizational environment
- Limited assessment of internal digital capabilities - Low employee readiness for digital innovation	digital maturity	Level of digital transformation
- Limited technical knowledge sharing - Irregular and inconsistent training - Poor documentation of smart project experiences - Limited investment in data-driven capabilities	Process quality	Institutional learning

Based on the qualitative analysis of the interviews, the subcategories and codes identified as the causal factors in digital innovation in internal auditing were seven and 31, respectively. Therefore, the conceptual model of the identified causal factors is as follows:

Table 5. Axial Coding of the Core Phenomenon Affecting Digital Innovation in Internal Auditing

Row	Main Category	Subcategory	Logical Statements (Initial Codes)
1	Core phenomenon affecting digital innovation in internal auditing	Enhancing audit accuracy and efficiency through digital innovation at Rafidain Bank	Reduction of human error in financial analysis through digital innovation in the bank's auditing
2			Increased transaction processing speed at Rafidain Bank through intelligent tools
3			Prediction of financial risks using machine learning models
4			Improved reliability of digital audit results
5			Reduction of audit process duration at Rafidain Bank through digital systems
1		Transformation in auditors' professional judgment and decision-making through digital innovation	Data-driven decision-making in auditing using intelligent tools
2			Integration of human judgment with digital analytics
3			Identification of hidden risks through intelligent data analysis
4			Increased accuracy in evaluating internal controls through technology
5			Reduced reliance on personal judgment
1		Data-driven transparency and accountability through digital innovation	Reduced human intervention in audit reports at Rafidain Bank
2			Transparent and data-based reporting
3			Enhanced managerial oversight of digital audit processes
4			Increased stakeholder trust in reports based on intelligent analytics
1		Technological innovation and the development of organizational capabilities	Establishment of innovation and data analytics units at Rafidain Bank
2			Development of intelligent and applied analytical tools at Rafidain Bank
3			Collaboration with technology firms to develop systems
4			Promotion of a culture of innovation and technology acceptance within teams
5			Synergy between auditors and data specialists at Rafidain Bank to improve processes

The analysis of the qualitative interviews indicated that the core phenomenon influencing digital innovation in internal auditing comprised four subcategories and 24 codes. Accordingly, the conceptual model of the core phenomenon is presented as follows:

Table 6. Axial Coding of Contextual Conditions Affecting Digital Innovation in Internal Auditing

Row	Main Category	Subcategory	Logical Statements (Initial Codes)
1	Contextual conditions affecting digital innovation in internal auditing	Strategic interaction of Rafidain Bank with external stakeholders	Receiving customer feedback on audit reports
2			Coordination with regulatory and governance bodies;
3			coordination with university and research center organizations;
4			coordination with consulting and technology organizations are integral aspects.
1		Strengthening the security of digital audit innovations at Rafidain Bank	Data confidentiality in digital auditing,
2			restricting access to digital audit systems, and countering cyber threats are essential.
3			Monitoring and countering cyber threats
4			Developing security protocols for audit processes
1		Provision and allocation of financial resources for digital innovation development	Budget allocation for the development of emerging technologies
2			Allocation of resources for employee training
3			Investment in artificial intelligence platforms
4			Budgeting for testing and developing new tools
1		Development of legal frameworks and professional standards in digital transformation	Compliance with data protection regulations
2			Transparency and accurate reporting requirements
3			National and international auditing standards
4			Compliance with regulatory frameworks governing AI use
1		Development of the organizational social and cultural infrastructure	Active acceptance of digital innovations by employees
2			Trust among teams and organizational units
3			Positive employee engagement with technological change
4			Strengthening a culture of continuous learning
5		Empowerment and active participation of employees in digital innovation	Collaboration among different employee generations
1			Encouragement of teamwork in digital projects
2			Sharing successful experiences among employees
3			Motivation and reward systems

4		Creating a safe environment for experimenting with ideas
1	Identification and evaluation of emerging technologies	Identification of new financial and auditing technologies
2		Evaluation of the competitive advantages of new tools
3		Alignment with global digital trends
4		Assessment and utilization of emerging technologies
1	Future outlook of digital innovation	Assessment of the future role of AI in internal auditing
2		Potential use of blockchain for transaction recording
3		Need to develop intelligent early-warning systems
4		Planning for partial automation of audit processes
1	Commitment to professional ethics and transparency in digital processes	Adherence to professional ethics in data processing
2		Identification and management of conflicts of interest
3		Commitment to transparency in reporting
4		Observance of social responsibility in technology implementation

The analysis of the qualitative interviews indicated that the contextual conditions influencing digital innovation in internal auditing comprised nine subcategories and 37 codes. Accordingly, the conceptual model of the contextual factors is presented as follows:

Table 7. Axial Coding of Intervening Conditions Affecting Digital Innovation in Internal Auditing

Row	Main Category	Subcategory	Logical Statements (Initial Codes)
1	Intervening conditions affecting digital innovation in internal auditing	Absence of legal and regulatory infrastructure at Rafidain Bank	Lack of explicit regulations governing the use of AI
2			Absence of relevant national and international standards
3			Lack of transparency in regulatory frameworks
4			Gaps in data security protocols
5			Absence of guidance on stakeholder protection
6			Weak oversight of technology implementation
7			Lack of governance policies for innovation
8			Employee confusion regarding legal requirements
1		Cultural and human resistance within Rafidain Bank	Employee fear of technological change
2			Negative attitudes toward data-driven analysis
3			Low motivation to learn new technologies

4		Weak knowledge sharing among teams
5		Poor teamwork in innovation projects
6		Distrust of AI-based decision-making
1	Financial and budgetary constraints at Rafidain Bank	Budget limitations
2		Lack of financial support for machine learning technologies
3		Shortage of adequate processing equipment
4		Limited budget for tool development
5		Insufficient allocation to research and development
1	Insufficient data-driven and AI skills among employees	Unfamiliarity with AI algorithms
2		Lack of experience with digital tools
3		Weakness in analyzing complex data
4		Limited ability to integrate human and artificial intelligence
5		Poor data-driven problem-solving skills
1	Weak managerial support for digital innovation	Lack of managerial support for adopting new technologies
2		Limited managerial participation in digital projects
3		Low managerial motivation to learn new technologies
4		Insufficient support for employee creativity
5		Weak monitoring of project progress by management
1	Deficiencies in technology and IT infrastructure	Lack of data integration
2		Infrastructure instability and weak security
3		Inability of systems to connect with AI tools
4		Incompatibility of software with emerging technologies
5		Limited system scalability
6		Inability to generate automated and accurate reports
7		Limited access to data analytics tools
1	Constraints in aligning with standards and digital technologies	Rising customer expectations

2	Inability to comply with international standards
3	Insufficient tools to reduce human error
4	Ambiguity in legal and regulatory requirements
5	Misalignment with global digital technology developments

The analysis of the qualitative interviews indicated that the intervening conditions influencing digital innovation in internal auditing comprised seven subcategories and 41 codes. Accordingly, the conceptual model of the intervening factors is presented as follows:

Table 7. Axial Coding of Strategic Factors Affecting Digital Innovation in Internal Auditing

Row	Main Category	Subcategory	Logical Statements (Initial Codes)
1	Strategic factors affecting digital innovation in internal auditing	Application of intelligent technologies to improve the performance of Rafidain Bank	Implementation of intelligent analytical tools
2			Enhancement of automated reporting systems
3			Continuous updating of software and systems
4			Rapid data processing through cloud platforms
5			System integration to achieve data coherence
1	Strategic factors affecting digital innovation in internal auditing	Improving Rafidain Bank's performance through blockchain technology	Transaction transparency
2			Data security and integrity
3			Improvement of the audit process's automation using blockchain technology
4			Continuous education on technology developments
5			Intelligent analytics and automation
6			Elimination of human errors
1		Technology-oriented future development of the audit system	Development of intelligent auditing using artificial intelligence
2			Development of advanced analytics using real-time data
3			Development of a digital ecosystem within bank units
4			Improvement of predictive automation in audit processes
1		Development of an innovation culture and technology adoption	Encouragement of the use of emerging technology by employees
2			Creating incentives for innovation among staff
3			Dissemination of successful practices within the bank
4			Establishment of a safe environment for innovation
5			Promotion of learning and creativity
1		Strengthening intelligent decision-making through artificial intelligence	Predictive risk analysis using AI tools

2		Supporting managerial decisions through AI
3		Detection of anomalies and fraud using AI algorithms
4		Optimization of resource allocation through AI
1	Enhancement of legal infrastructure and standardization	Formulation of explicit laws and policies for AI use
2		Compliance with standards and increased credibility of reports
3		Implementation of security protocols and risk reduction
4		Development of transparent regulatory frameworks
5		Continuous evaluation and revision of standards
1	Transparency and accuracy of transactions through blockchain	Immutable transaction recording
2		Real-time transaction transparency
3		Automation of data verification
4		Prediction and identification of anomalies
1	Future-oriented digital transformation with audit transparency	Real-time transaction traceability
2		Assurance of data accuracy and security
3		Improvement of audit process automation
4		Risk prediction and analysis using artificial intelligence
5		Increased stakeholder trust

The analysis of the qualitative interviews revealed that the strategic conditions for digital innovation in internal auditing had eight subcategories and 38 codes. Hence, the conceptual model of the strategic factors is as follows:

Table 8. Axial Coding of Outcome Factors Affecting Digital Innovation in Internal Auditing

Row	Main Category	Subcategory	Logical Statements (Initial Codes)
1	Outcome factors affecting digital innovation in internal auditing	Increased accuracy and trust in Rafidain Bank reports	Reduction of human errors in bank reports
2			Improved validity and accuracy of data analyses
3			Increased stakeholder trust in bank reports
4			Data integration and enhanced reporting accuracy
5			Improved transparency through data analytics
6			Preventive risk identification using analytical tools
1	Enhanced audit efficiency through digital technologies		Optimization of time and resources in digital auditing
2			Accelerated analysis of complex data
3			Strengthened rapid, data-driven decision-making
4			Reduced the need for human intervention in repetitive stages
5			Rapid processing of big data through advanced systems
6			Increased operational capacity of the audit team through digital tools

1	Strengthened accountability and responsibility through transparent systems	Enhanced employee accountability via data-driven systems
2		Increased customer responsiveness and satisfaction
3		Accurate documentation and transparency in auditing through digital systems
4		Reinforced accountability through digital platforms
5		Role of transparent systems in reducing conflicts of interest
1	Data-driven risk prediction and management	Forecasting financial and operational trends
2		Risk reduction through automated systems
3		Risk mitigation via enhanced early-warning systems
4		Data-based risk-oriented decision-making
1	Strengthening digital innovation through blockchain technology	Reduction of errors and risks through blockchain
2		Improved automation of audit processes
3		Real-time tracking and monitoring of transactions
1	Enhancement of employee skills through modern technologies	Development of audit team knowledge and skills through training and analytical tools
2		Application of emerging technologies in projects
3		Improved analytical capabilities of employees
4		Strengthened skills through learning intelligent tools
1	Interaction with regulatory and supervisory institutions	Collaboration with universities and research centers
2		Partnership with consulting and technology firms
3		Engagement with regulatory bodies
4		Inter-organizational collaboration and improvement of digital projects
1	Strengthening competitive advantage and organizational value	Increased customer trust in digital systems
2		Creation of a competitive advantage over other organizations
3		Enhanced reputation and credibility
4		Alignment with global standards and developments
5		Identification of opportunities and service development through emerging technologies

The analysis of the qualitative interviews showed that the strategic conditions for digital innovation in internal auditing consisted of eight subcategories and 37 codes. Consequently, the conceptual model for the strategic factors is proposed as follows:

Selective Coding

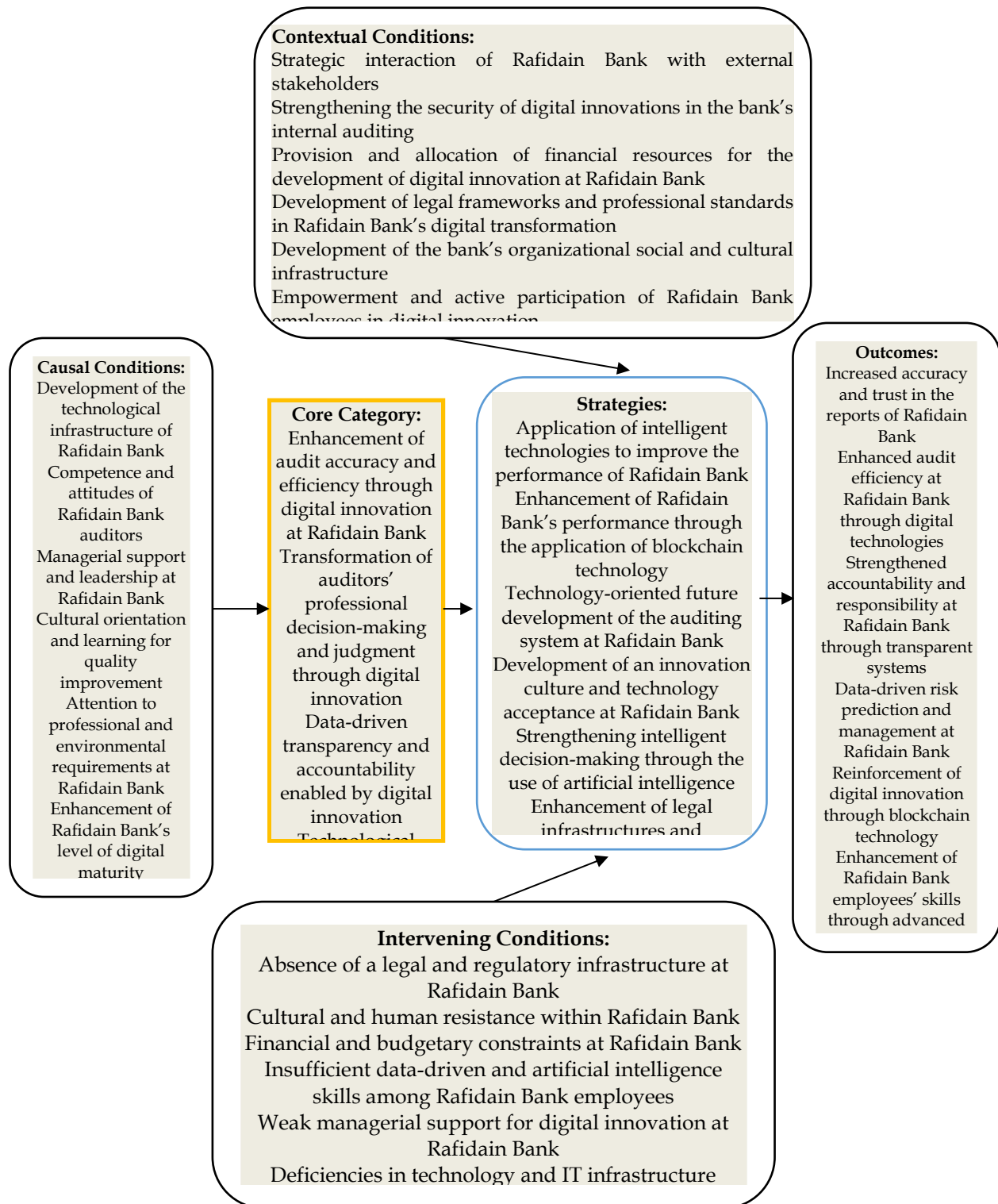
Theoretical coding is the term used to describe the arrangement of axial codes in a systematic way side by side, according to their logical relationship and their relationship to other codes, the validation of such relationships, and filling in the gaps using codes that require further refinement and development (Charmaz, 2006). This stage represents the most abstract level of coding, through which the relationships among the generated categories are explicated. To achieve the intended level of integration at this stage, the researcher must define the core phenomenon and remain analytically committed to it. The outcome of this stage is the development of a theory. Friedman (1999) conceptualized theory as an organizing framework that enables the use of similar data to predict and explain empirical events. Others have regarded theory as a substitutable hypothesis. These perspectives are primarily grounded in quantitative and empirical paradigms; however, within a qualitative perspective, theory can be understood as a process of conceptualization (as cited in Flick,

2002). In this section, axial codes were integrated in a composite manner, and the content of each was organized within the framework of theoretical codes, as presented in Table 9.

Table 9. Theoretical (Selective) Coding of the Model of the Impact of Digital Innovation on Internal Auditing: A Case Analysis of Rafidain Bank

Row	Main Category	Subcategory
1	Causal Factors	Development of Rafidain Bank's technological infrastructure
2		Competence and attitudes of Rafidain Bank auditors
3		Managerial support and leadership at Rafidain Bank
4		Cultural and learning orientation in quality improvement
5		Attention to the professional and environmental requirements of Rafidain Bank
6		Enhancement of Rafidain Bank's digital maturity level
7		Improvement of process quality and learning at Rafidain Bank
1	Core Category	Enhancing audit accuracy and efficiency through digital innovation at Rafidain Bank
2		Transformation of auditors' professional judgment and decision-making through digital innovation
3		Data-driven transparency and accountability through digital innovation
4		Technological innovation and the development of organizational capabilities
1	Contextual Factors	Strategic interaction of Rafidain Bank with external stakeholders
2		Strengthening the security of digital innovations in auditing at Rafidain Bank
3		Provision and allocation of financial resources for digital innovation development at Rafidain Bank
4		Development of legal frameworks and professional standards in Rafidain Bank's digital transformation
5		Development of the bank's organizational, social, and cultural infrastructure
6		Empowerment and active participation of Rafidain Bank employees in digital innovation
7		Identification and evaluation of emerging technologies at Rafidain Bank
8		Future outlook of digital innovation at Rafidain Bank
9		Commitment of Rafidain Bank to professional ethics and transparency in digital processes
1	Intervening Factors	Absence of legal and regulatory infrastructure at Rafidain Bank
2		Cultural and human resistance within Rafidain Bank
3		Financial and budgetary constraints at Rafidain Bank
4		Insufficient data-driven and artificial intelligence skills among Rafidain Bank employees
5		Weak managerial support for digital innovation at Rafidain Bank
6		Deficiencies in technology and IT infrastructure
7		Constraints in aligning Rafidain Bank with digital standards and technologies
1	Strategies	Application of intelligent technologies to improve Rafidain Bank's performance
2		Enhancement of Rafidain Bank's performance through blockchain technology
3		Technology-oriented future development of the audit system at Rafidain Bank
4		Development of an innovation culture and technology adoption at Rafidain Bank
5		Strengthening intelligent decision-making through the use of artificial intelligence
6		Enhancement of legal infrastructure and standardization at Rafidain Bank
7		Transparency and accuracy of transactions at Rafidain Bank through blockchain
8		Future-oriented digital transformation with audit transparency at Rafidain Bank
1	Outcomes	Increased accuracy and trust in Rafidain Bank's reports
2		Enhanced audit efficiency at Rafidain Bank through digital technologies
3		Strengthened accountability and responsibility through transparent systems at Rafidain Bank
4		Data-driven risk prediction and management at Rafidain Bank
5		Strengthening digital innovation through blockchain technology
6		Enhancement of Rafidain Bank employees' skills through modern technologies and tools
7		Interaction with regulatory and supervisory institutions
8		Strengthening Rafidain Bank's competitive advantage and organizational value

Based on the integration of the layers presented in the preceding sections, the final research model is described as follows.



The findings of the study reveal a notable transformation in the internal audit practices of Rafidain Bank following the implementation of digital accounting information systems. The evidence suggests that financial information is available in real-time, manual processes minimize errors, and continuous audit and monitoring processes improve transparency.

Discussion and Conclusion

The purpose of this study is to examine and develop a model to describe the impact of digital innovation on internal auditing, particularly in the case of the Rafidain Bank case study. The research design has been based

on a mixed research approach, with both quantitative and qualitative components, the latter of which has been based on the grounded theory approach of Strauss and Corbin. One of the strategic challenges in the banking audit system, especially in the case of Rafidain Bank, has been the lack of a comprehensive model to leverage the advantages of modern digital technologies in the audit system in a way that is compatible with the developments in technology, on the one hand, and the needs of the internal audit system, on the other, in a way that enhances the accuracy, efficiency, and transparency of the audit reports. The bank has tremendous potential in terms of technology, human resources, and management, but no clear model based on the concept of digital innovation and the application of advanced technologies like AI and blockchain has yet been developed and implemented in the internal audit system.

Through our thorough and comprehensive review of the banking sector, specifically an Iraqi bank under study, we can conclude that the gaps and problems facing the banking system can be attributed to a lack of the necessary technological capabilities to overcome them. Therefore, we can emphasize the urgent need to develop the banking sector technologically and provide all the necessary financial and logistical support to build and develop this vital sector in line with aspirations and to keep pace with the global banking sector.

Moreover, the empowerment of employees regarding the utilization of advanced technology can improve the productivity of the audit units of the bank and help the bank adopt new technologies. Finally, the interaction with the relevant regulatory authorities can help the bank comply with the relevant standards and accurately account for the results, thus ensuring the results of the digital innovation process and developing a higher level of trust in the results of the digital innovation process. It can be stated that the utilization of modern digital technologies can improve the competitive advantage of Rafidain Bank and its organizational value. Therefore, it can be stated that the aforementioned factors can ensure the effective implementation of the digital innovation process and the improvement of the internal audit results of Rafidain Bank.

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