

The Role of Digital Accounting in Enhancing Information Security and Improving the Efficiency of Financial Reports: Applied Study in a Sample of Iraqi Banks

Hayder Oudah Kadhim

Department of Accounting College of Administration and Economics, University of Al-Qadisiyah, Iraq
hadier.saidy@qu.edu.iq

Abstract: The study purposes to analyze the role of digital accounting (DA) in enhancing information security (IS) and refining the efficiency of financial journalism, through an applied education on a taster of Iraqi banks. The importance of the study comes from the fast shift near digitization in the accounting field, particularly in the banking environment, which is one of the greatest sensitive subdivisions for IS and accuracy of reports. The study relied on the descriptive analytical approach, in addition to collecting data through a questionnaire distributed to the employees of accounting and information technology departments in a number of Iraqi banks. The results found a statistically significant positive relationship between the application of DA and the enhancement of IS, as well as a clear impact on improving the quality and efficiency of financial reports in terms of accuracy, speed, and analysis. The study recommended the need to support the digital infrastructure in Iraqi banks, develop the capabilities of workers in the field of DA, and strengthen cybersecurity systems in line with the rapid technological development.

Keywords: Digital Accounting, Information Security, Financial Reports, Iraqi banks.



This is an open-access article under the [CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/) license

Introduction:

In recent decades, the world has witnessed rapid developments in the field of information and communication technology, and this development has been directly reflected in accounting practices, as institutions, especially banks, have begun to adopt digital accounting systems based on cloud computing, artificial intelligence, and big data analysis techniques, with the aim of improving work efficiency and ensuring the accuracy and reliability of financial information. In light of this digital transformation, there is an urgent need to enhance IS, especially in the banking sector, which deals with sensitive financial data that requires the highest levels of protection from cyber breaches and threats. Hence the importance of DA as a tool not only to improve the efficiency of financial reporting, but also as a means to enhance IS. This study seeks to shed light on the relationship between the adoption of DA on the one hand, and IS and the efficiency of

financial reporting on the other hand, through an applied study in a sample of Iraqi banks. Where the extent to which banks are aware of the importance of this transformation, and the extent of its impact on the reality of their accounting and information work, will be analyzed.

Part One: Research Methodology

1-1 - Research Problem:

Iraqi banks face significant challenges in improving the efficiency of their financial reports and ensuring the accuracy of the financial information on which they rely in making strategic and operational decisions. The rapid development of information technology, traditional systems in accounting are less able to meet the requirements of the digital age in the field of financial data analysis and timely accurate reporting. Hence, the research problem arises in a basic question about the impact of the application of DA in improving the efficiency of financial reporting and enhancing IS in Iraqi banks. Can the shift towards DA improve the level of security in financial transactions, thereby improving the efficiency and reliability of financial reports? What are the challenges that Iraqi banks may face in implementing these digital systems?.

1-2 - the importance of research:

The importance of research is increasing today as a result of the rapid technological transformations that the world is witnessing, which directly affect all sectors, especially the banking sector. Through this research, the researcher seeks to highlight the vital role that DA can play in improving accounting performance in Iraqi banks, which is an essential step to keep pace with global developments in the field of informatics and digital security. The research contributes to illustrating how DA systems can play an important role in reducing security risks facing banks, such as stealing financial data or breaching systems, among others.

1-3 - The Objectives of Research:

This research purposes to achieve a set of foremost objectives that contribute to understanding the relationship between DA, IS, and the efficiency of financial reportage in Iraqi banks. These objectives are to study the impression of DA on enhancing IS in Iraqi banks, analyze the role of DA in refining the efficiency of financial reportage in Iraqi banks, identify the challenges opposite Iraqi banks in the application of DA, provide recommendations for the growth of the application of DA in Iraqi banks, and keep step with global growths in DA technology:

1-4 - Research hypotheses:

The research is based on the following hypotheses:

H1: The application of DA in Iraqi banks leads to reducing the security risks associated with financial statements and protecting them from cyber threats.

H2: The application of DA in Iraqi banks contributes to improving the accuracy and reliability of financial reports in a timely manner.

H3: The existence of a positive relationship between the level of training in DA and the improvement of financial reporting performance and information security in Iraqi banks.

H4: Iraqi banks face challenges in applying DA as a result of the weakness of the technological infrastructure, and the lack of trained human resources in this field.

1-5 - Society and sample research:

The research community includes all Iraqi banks that apply or seek to apply DA in their accounting and financial operations. A sample was selected from 5 private banks listed on the Iraq Stock Exchange that adopt or seek to apply DA in their accounting systems. These banks were selected based on criteria that include the use of DA systems, in addition to the presence of

security measures to protect financial data, the banks selected in the research sample were applied for the period 2015-2024 and these banks are as follows:

- 1- Gulf Commercial Bank.
- 2- Bank of Baghdad.
- 3- Middle East Bank.
- 4- International Development Bank
- 5- North Bank.

1-6 - Research Methodology:

In light of the importance of the research and its hypothesis, the descriptive approach was adopted in the theoretical study through books, periodicals and university theses related to the subject, as well as the analytical approach by studying the possibility of achieving the research objective by applying in the research sample.

Part Two: the theoretical aspect of the research

2-1- The concept and importance of digital accounting:

DA refers to the use of digital technology and systems in conducting accounting operations instead of traditional paper-based methods. DA involves the use of accounting software that enables companies and banks to digitally and efficiently enter, process, and store financial data (Lee & Kim, 2021: 178). The importance of DA can be illustrated by the following:

- 1- Improve efficiency and accuracy: Reduce human errors: DA systems contribute to reducing errors resulting from manual data entry. It also facilitates complex calculations, enhancing the accuracy of financial reporting (Gupta & Sharma, 2021: 92).
- 2- Speed of processing: DA software helps in conducting accounting operations faster and more efficiently compared to traditional methods (Parker, 2023: 56).
- 3- Enhance security and data protection: Information protection: DA provides advanced security systems to protect financial data from hacks or manipulation. It also enables data to be stored in an encrypted form, reducing the risk of unauthorized access (Kogan & Kogan, 2023: 237).
- 4- Tracking and auditing: enables digital systems to track all financial operations and conduct an internal audit to identify any manipulation or errors in the data (Chen, 2020: 49).
5. Improve financial analysis and planning capability: Financial data can be easily analyzed via tools such as real-time graphs and performance reports (Brown, 2022: 54).
6. Compare performance: Performance can be compared over time and financial trends can be analyzed quickly, enhancing the ability to make effective strategic decisions (Gupta & Sharma, 2021: 94).
7. Reduce operational costs: Through DA, the use of paper and printing is reduced, helping to reduce operational costs (Smith, 2022: 106).
- 8- Reduce the need for human resources: DA software reduces reliance on manual processes, so human resources can be allocated to other, more important tasks (Lee & Kim, 2021: 179).

DA systems ensure that financial reporting complies with international accounting standards (e.g. IFRS and GAAP), enhancing transparency and ensuring the reliability of financial reporting (Chen, 2020:52). Digital systems facilitate periodic and regulatory compliant financial disclosure, contributing to enhanced trust with shareholders and investors (Kogan & Kogan, 2023: 240). Digital systems also enable quick access to data through cloud storage or online data storage

systems, facilitating the sharing of information between stakeholders such as managers, accountants, and auditors (Smith, 2022: 108).

DA systems help keep pace with technological developments, allowing organizations to leverage future innovations in accounting, such as artificial intelligence and machine learning, to improve financial audits and analysis (Parker, 2023: 62). DA represents an essential step towards improving the performance of financial institutions and banks by providing effective and secure financial data management solutions. (Gupta & Sharma, 2021: 96).

2-2- Information Security and Efficiency of Financial Reporting: A Conceptual Framework:

(IS) is one of the key factors to ensure the integrity of financial data in a DA environment. This includes protecting data and keeping information confidential from unauthorized access or manipulation. In this context, DA requires advanced systems to protect data from cyber-attacks, and ensure the reliability of financial reporting (Lee & Kim, 2021: 180)..

IS in DA includes several key components, including: (Kogan & Kogan, 2023: 237).

- 1- Encryption: to protect financial data during its transfer or storage.
- 2- Identity verification: to ensure that only authorized users have access to financial statements.
- 3- Backup: to ensure data recovery in the event of a cyber-attack.
- 4- System monitoring: to ensure the detection of unusual activities and prevent potential threats.

The efficiency of financial reporting is one of the major advantages of DA, as it enables digital systems to produce accurate and transparent reports. Accounting software facilitates fast and reliable data processing, helping to make informed financial decisions in a timely manner (Gupta & Sharma, 2021: 92).

(IS) is one of the primary factors that affect the efficiency of financial reports. The presence of robust security systems ensures the protection of data from tampering and increases the reliability of reports. In the event that systems are exposed to threats or breaches, this may negatively affect the accuracy of the reports and thus affect financial decisions (Parker, 2023: 56).

IS contributes to making the right financial decisions by ensuring that data is accurate and not exposed to any manipulation or hacking. Protected data gives organizations the confidence to use it to guide important financial decisions (Brown, 2022:54). Organizations face several challenges in maintaining IS and the quality of financial reporting, such as increased cyber threats. Legacy systems that may not be able to address the latest security technologies, and the high cost of developing and implementing effective security systems (Chen, 2020: 52).

IS in DA is a basis for ensuring the efficiency of financial reporting. By ensuring data protection and improving information accuracy, managers and investors are able to make reliable and fast financial decisions. However, many challenges remain to be faced to ensure the effectiveness of DA systems (Parker, 2023: 56).

2-3- The relationship between digital accounting and enhancing information security:

DA is one of the areas that has witnessed great development in recent years thanks to technological innovations, as it contributes to improving the efficiency of financial transactions and increasing the accuracy of reports. As these DA systems evolve (Sharma & Mehta, 2024: 57). IS emerges as a critical factor to ensure data protection and ensure the reliability of financial reports. The relationship between DA and (IS) is both a challenge and an opportunity (Rani & Singh, 2024: 63). Modern digital technologies interfere with security measures to ensure the protection and proper management of financial data. DA provides innovative tools and technologies for organizations to improve the security of financial statements through:

1- Encryption: Encryption protects financial data during its transfer or storage, ensuring data confidentiality and preventing unauthorized access (Lee & Kim, 2021:180).

2- Continuous monitoring: DA systems help monitor abnormal activities through modern cybersecurity tools such as graphical analysis systems, which detect any manipulation or penetration in real time (Parker, 2023: 56).

Thanks to advanced DA technologies, human errors in the processing of financial statements are reduced, which enhances the accuracy of reports, as follows:

1- Multi-factor authentication: DA systems rely on multiple verification such as encrypted passwords and biometric verification, ensuring that only authorized persons have access to financial information (Gupta & Sharma, 2021: 92).

2- Backup: DA involves secure backups of financial data, providing protection against loss or theft (Kogan & Kogan, 2023: 240).

DA contributes to improving the efficiency of financial reporting by protecting financial data and ensuring its accuracy, as follows:

1. Real-time reporting: DA systems provide the ability to produce real-time financial reports, contributing to strategic and rapid financial decisions (Brown, 2022: 50).

2- Data analysis: Digital systems allow accurate analysis of financial data via advanced analysis tools, increasing the reliability of reports (Chen, 2020: 58)).

Despite technological advancements, DA faces security challenges related to cyber threats and rapid developments in technology. Such as: cyber-attacks, although systems are secure, there are always threats of cyber-attacks aimed at penetrating DA systems (Lee & Kim, 2021: 182), and the high cost, developing advanced security systems can be expensive and challenging in small and medium-sized enterprises (Gupta & Sharma, 2021: 95).

DA and IS are two key pillars to ensure the continuity of financial business and achieve the strategic objectives of institutions. By integrating advanced security systems with DA, the accuracy and protection of financial reporting can be enhanced, enhancing confidence in the financial information extracted (Chen, 2020: 59).

2-4- The relationship between digital accounting and the efficiency of financial reporting:

DA is one of the main pillars in the development of modern accounting systems, as organizations benefit from digital technology in organizing and processing financial statements more accurately and effectively. In this context, the efficiency of financial reporting is crucial, as it contributes to improving strategic financial decision-making and contributes to enhancing transparency and accountability. The relationship between DA and the efficiency of financial reporting is a key axis in improving financial operations and providing more accurate, reliable reporting (Jindal & Rathi, 2023: 112), and speed as follows:

1- The impact of DA on the accuracy of financial reports: Through the use of DA systems, human errors that may occur in traditional processes are reduced. Modern accounting software helps in automatically calculating and auditing financial transactions (Singh & Verma, 2022: 67), reducing gaps and arithmetic errors that may appear when entering data manually. This enhances the accuracy of financial reporting, accounting software Advanced facilitates complex calculations and provides more accurate estimates in balance sheet and profit and loss reports (Gupta & Sharma, 2021:93). DA systems help in correctly classifying data and organizing reports in accordance with International Accounting Standards (Lee & Kim, 2021: 182).

2- Speed and efficiency of financial reporting: DA speeds up financial reporting processes. Compared to traditional methods that require cumbersome manual processes, digital technologies

simplify financial transactions and store data in centralized and easily accessible systems, helping in faster financial reporting (Kumar & Mehta, 2024: 45). DA systems allow for the production of real-time or automated financial reports, helping companies evaluate their financial performance in real time (Kogan & Kogan, 2023: 245). Digital systems facilitate automated data auditing, making it easier to find missing data or errors during financial analysis (Brown, 2022: 51).

3- Enhancing transparency in financial reporting: DA contributes to improving transparency by providing reliable and accurate financial statements. These computerized financial reports are more examinable and can be easily reviewed by interested parties such as internal or external auditors, contributing to reducing gaps or potential manipulation. Through cloud accounting systems, organizations can improve access to financial data, facilitating financial disclosure and in line with international accounting standards (Patel & Mishra, 2023:92). Digital systems also reduce data manipulation thanks to advanced security systems that protect financial data from breaches or manipulation (Parker, 2023: 59).

4- Improving the ability to analyze financial and make decisions: One of the most prominent benefits of DA is its ability to easily analyze financial data using modern tools such as interactive reports and graphs. This allows CFOs to make strategic decisions based on live and accurate data. Financial analysis tools help to understand financial trends more clearly, improving the financial planning and decision-making process (Sharma & Joshi, 2023: 115).

5- International Accounting Standards Compliance: DA mainly enhances compliance with international accounting standards (such as IFRS and GAAP), as DA programs automatically apply accounting rules (Singh & Rathi, 2023: 210), which facilitates the review of financial reports and increases their reliability. DA systems provide easy adjustment and updating to comply with new accounting audits and standards, contributing to improved regulatory compliance (Chen, 2020:61).

Part Three: the applied side of the research

3-1 - About the research sample:

A sample was selected from 5 private banks listed on the Iraq Stock Exchange, which adopt or seek to apply DA in their accounting systems. These banks were selected based on specific criteria that include the use of DA systems, as well as the existence of security measures to protect financial data from digital risks. The time period in which the research was applied is from 2015 to 2024, where the impact of DA on IS and the efficiency of financial reporting was studied during this period. The deliberate banks are as shadows:

1- Khalij Commercial Bank: It is illustrious by its reliance on progressive DA systems to facilitate accounting processes and protect its customers' data finished modern security systems.

2- Bank of Baghdad: It is one of the foremost banks in the field of DA in Iraq, as it seeks to adopt the latest DA systems to provide accurate and protected financial reports, while enhancing safety measures to defend data.

3- Middle East Bank: It relies on progressive digital solutions in all financial and managerial accounting processes, and works to reinforce security measures to safeguard the protection of financial information.

4- International Development Bank: It works to inform its accounting systems to retain pace with technological growth in the field of DA, and relies on combined security answers to protect the financial data of its clientele.

5- North Bank: seeks to gadget modern DA systems to recover the efficiency of financial journalism and enhance data correctness, with a focus on if a secure environment for financial information.

3-2- Measuring the education variables in the research sample for the period 2015-2024:

In this paragraph, the main variables affecting DA, IS and the efficiency of financial reportage in private banks registered on the Iraq Stock Conversation are measured. For each of these variables, we will present tables giving the extracted data by an analysis that illustrates the consequences and the importance of each variable in enhancing the effectiveness and assessment of accounting systems. By gauging each variable, we will be able to classify time trends and growths in these banks, sparkly the impact of (DA) on the financial presentation of banks..

First: Measuring the DA Variable: DA means the use of such as enterprise resource management (ERP) systems and mist systems to enable accounting processes and provide flexible and protected solutions for banks. These systems are important to improving the correctness and quality of financial processes in banks. The following table events the degree to which these digital systems have been applied over the ten years (2015-2024) in the five designated banks. DA in Banks (2015-2024) can be measured finished the following table:

Table 1: Measuring DA in Banks (2015-2024)

Years	Gulf Commercial Bank	Bank of Baghdad	Middle East Bank	International Development Bank	North Bank
2015	60% (ERP system)	55% (cloud system)	50% (ERP system)	58% (cloud system)	52% (ERP system)
2016	65% (ERP system)	60% (cloud system)	55% (ERP system)	63% (cloud system)	57% (ERP system)
2017	70% (ERP system)	62% (cloud system)	60% (ERP system)	67% (cloud system)	62% (ERP system)
2018	75% (ERP system)	65% (cloud system)	65% (ERP system)	70% (cloud system)	65% (ERP system)
2019	80% (ERP system)	68% (cloud system)	70% (ERP system)	75% (cloud system)	68% (ERP system)
2020	85% (ERP system)	72% (cloud system)	75% (ERP system)	80% (cloud system)	72% (ERP system)
2021	90% (ERP system)	75% (cloud system)	80% (ERP system)	85% (cloud system)	75% (ERP system)
2022	92% (ERP system)	78% (cloud system)	85% (ERP system)	87% (cloud system)	78% (ERP system)
2023	95% (ERP system)	80% (cloud system)	90% (ERP system)	90% (cloud system)	80% (ERP system)
2024	98% (ERP system)	85% (cloud system)	92% (ERP system)	95% (cloud system)	85% (ERP system)

The percentage of DA systems (like cloud-based computing or ERP) that each bank has used over time can be seen in the table. Over time, there has been a consistent rise in the use of these tools, which is indicative of the banking industry's growing trend toward digital transformation. The rates were comparatively low in the beginning stages (2015–2016), but banks over time started implementing technological innovations. The greater utilization of DA improves the capacity for carrying out accounting tasks quicker and more precisely.

Second: Measuring the information security variable: IS stands for the efficient protection of financial data against dangers like electronic fraud and intrusion. In order to guarantee privacy of information and shield it from possible harm, banks must employ modern security technologies like firewalls and encoding. The progress banks made in putting digital security systems in place

between 2015 and 2024 can be seen in the following table. The following table offers an illustration of how IS is measured in financial institutions from 2015 to 2024:

Table 2: Measuring IS in Banks (2015-2024)

Years	Gulf Commercial Bank	Bank of Baghdad	Middle East Bank	International Development Bank	North Bank
2015	70% (Encryption + Firewalls)	65% (encryption + firewalls)	60% (Encryption + Firewalls)	68% (encryption + firewalls)	62% (Encryption + Firewalls)
2016	72% (Encryption + Firewalls)	67% (Encryption + Firewalls)	62% (Encryption + Firewalls)	70% (Encryption + Firewalls)	65% (encryption + firewalls)
2017	75% (Encryption + Firewalls)	70% (Encryption + Firewalls)	65% (encryption + firewalls)	72% (Encryption + Firewalls)	68% (encryption + firewalls)
2018	78% (encryption + firewalls)	73% (Encryption + Firewalls)	68% (encryption + firewalls)	75% (Encryption + Firewalls)	72% (Encryption + Firewalls)
2019	80% (Encryption + Firewalls)	75% (Encryption + Firewalls)	70% (Encryption + Firewalls)	78% (encryption + firewalls)	75% (Encryption + Firewalls)
2020	83% (Encryption + Firewalls)	78% (encryption + firewalls)	72% (Encryption + Firewalls)	80% (Encryption + Firewalls)	78% (encryption + firewalls)
2021	85% (Encryption + Firewalls)	80% (Encryption + Firewalls)	75% (Encryption + Firewalls)	83% (Encryption + Firewalls)	80% (Encryption + Firewalls)
2022	88% (encryption + firewalls)	83% (Encryption + Firewalls)	78% (encryption + firewalls)	85% (Encryption + Firewalls)	83% (Encryption + Firewalls)
2023	90% (Encryption + Firewalls)	85% (Encryption + Firewalls)	80% (Encryption + Firewalls)	88% (encryption + firewalls)	85% (Encryption + Firewalls)
2024	92% (Encryption + Firewalls)	88% (encryption + firewalls)	85% (Encryption + Firewalls)	90% (Encryption + Firewalls)	88% (encryption + firewalls)

The table indicates that the use of security policies, like firewalls and encrypting it has continuously improved over time. Since banks that use digital systems are better equipped to update and begin using the newest security technologies, like encryption and data security over networks, these measures are becoming increasingly common in banks to guarantee data security, which reflects their commitment to protecting the cash and data of their customers.

Third: Measuring the variable of the efficiency of financial reports: The ability to deliver timely, precise, and trustworthy financial information that support wise financial choices is known as financial reporting effectiveness. The speed of reporting, the precision of the data supplied, and adherence to international accounting norms all play a role in this. In this respect, the effectiveness of financial reporting in a few chosen financial institutions over time is displayed in the next table. It is possible to assess the effectiveness of bank reporting on finances from 2015 to 2024 using the following table:

Table 3: Measuring the competence of monetary reports in banks (2015-2024)

Years	Gulf Commercial Bank	Bank of Baghdad	Middle East Bank	International Development Bank	North Bank
2015	75% (accuracy + speed)	70% (accuracy + speed)	68% (accuracy + speed)	72% (accuracy + speed)	70% (accuracy + speed)
2016	78% (accuracy + speed)	72% (accuracy + speed)	70% (accuracy + speed)	75% (accuracy + speed)	73% (accuracy + speed)
2017	80% (accuracy + speed)	75% (accuracy + speed)	72% (accuracy + speed)	78% (accuracy + speed)	75% (accuracy + speed)
2018	82% (accuracy + speed)	77% (accuracy + speed)	74% (accuracy + speed)	80% (accuracy + speed)	78% (accuracy + speed)
2019	85% (accuracy + speed)	80% (accuracy + speed)	77% (accuracy + speed)	82% (accuracy + speed)	80% (accuracy + speed)
2020	88% (accuracy + speed)	83% (accuracy + speed)	80% (accuracy + speed)	85% (accuracy + speed)	83% (accuracy + speed)
2021	90% (accuracy + speed)	85% (accuracy + speed)	82% (accuracy + speed)	87% (accuracy + speed)	85% (accuracy + speed)
2022	92% (accuracy + speed)	87% (accuracy + speed)	85% (accuracy + speed)	90% (accuracy + speed)	87% (accuracy + speed)
2023	94% (accuracy + speed)	89% (accuracy + speed)	88% (accuracy + speed)	92% (accuracy + speed)	90% (accuracy + speed)
2024	95% (accuracy + speed)	90% (accuracy + speed)	90% (accuracy + speed)	94% (accuracy + speed)	92% (accuracy + speed)

The table shows a continuous increase in the accuracy and speed of financial reports submitted by banks. This reflects developments in the efficiency of accounting processes finished the use of contemporary digital systems. With the augmented use of progressive accounting software, banks are healthier able to harvest financial reports additional accurately and quickly, which improves opportune financial decision-making.

3-3 - Testing research hypotheses:

In this piece, research hypotheses will be verified using suitable statistical methods that help analyze the data and deliver evidence-based deductions. Statistical methods such as the (T) test for means, correlations and reversion will be used founded on the nature of the data and the variables of the education..

First: Testing the first hypothesis: This hypothesis states the following: "The application of DA in Iraqi banks leads to reducing the security risks associated with financial statements." To measure this hypothesis, data were collected on the number of security incidents before and after the application of DA in the banks of the research sample. The T-test for correlated samples was

used to compare the two averages (before and after application). The T-test for the number of security incidents before and after the application of DA can be illustrated by the following table:

Table 4: T test for the amount of security occurrences before and after the request of DA

Standard	Before application	After application	T value	P-value (P)	Resolution
Average number of security incidents	7.1	1.2	9.45	0.000	Acceptance of the hypothesis

The results indicate a significant decrease in the number of security incidents after the implementation of DA, with the average dropping from 7.1 to 1.2. The P value was < 0.01 , which designates a statistically significant change, and thus the fallouts confirm the cogency of the first hypothesis.

Second: Testing the second hypothesis: This hypothesis states the following: "The application of DA donates to refining the accuracy and dependability of financial reports in a opportune manner." The percentage of errors in financial intelligences was used as an pointer of accuracy, with the average of this relation compared before and after the request of DA using the T-test. The T-test for the fraction of errors of financial intelligences before and after the request of DA can be exemplified through the following table:

Table 5: T-test for the fraction of errors in financial intelligences before and after the request of DA

Standard	Before application	After application	T value	P-value (P)	Resolution
Average percentage of financial errors	5.2%	0.9%	11.07	0.000	Acceptance of the hypothesis

The results showed a significant improvement in the accuracy of financial reporting after the digital transformation, with the percentage of errors dropping from 5.2% to 0.9%. The consequence was statistically significant ($P = 0.000$), supporting the additional hypothesis.

Third: Testing the third hypothesis: This hypothesis states the following: "There is a positive relationship between the level of DA training and the improvement of financial reporting performance and IS." Pearson analysis was used to measure the relationship between the number of training hours, the number of security incidents, and the percentage of errors in financial reports. The analysis of the correlation between training and financial and security performance can be illustrated by the following table:

Table 6: Analysis of the correlation between training and financial and security performance

Relationship	Correlation coefficient (r)	P-value (P)	Relationship Type
Training and number of security incidents	-0.81	0.002	Strong negative relationship
Training and percentage of errors in financial reporting	-0.74	0.004	Strong negative relationship

The results show that increasing the level of training has a strong negative correlation with both the number of security incidents and the percentage of reporting errors, which means that the more training, the fewer errors and risks, thus accepting the third hypothesis..

Fourth: Testing the fourth hypothesis: This hypothesis states the following: "Iraqi banks face challenges in applying DA as a result of poor infrastructure and lack of trained cadres." The challenges were measured based on questionnaires and surveys of employees in the five banks, and the constraints were categorized according to their importance and frequency. The most prominent challenges facing the application of DA in Iraqi banks can be clarified through the following table:

Table 7: The most prominent challenges facing the application of DA in Iraqi banks

Challenge Type	Incidence (%)	Sort by importance
Poor technological infrastructure	82%	1
Lack of qualified accounting cadres	77%	2
High costs of digital systems	69%	3
Weak government and regulatory support	58%	4

The above table shows the most prominent challenges facing the application of DA in Iraqi banks, through four main axes classified according to the incidence rate and its relative importance, which reflects the practical and environmental reality of banks in Iraq with regard to digital transformation in the accounting field. The table shows that poor infrastructure and lack of qualified human resources are the two most prominent challenges in the banks of the research sample for the period 2015-2024, as they were selected by more than 75% of the respondents. These results strongly support the fourth hypothesis.

Part Four: Conclusions and Recommendations

4.1 Conclusions:

1- The application of DA has contributed significantly to reducing security risks related to financial statements. Cyber incidents have clearly decreased after the use of digital systems, suggesting that reliance on IS technologies associated with DA (such as cryptography, double entry systems) has been effective in protecting sensitive financial information.

2- DA has improved the accuracy and reliability of financial reports in banks. The statistical results showed a significant reduction in the percentage of errors in reporting, indicating that accounting software reduced human intervention and contributed to better compliance with the International Accounting Standards.

3- There is a strong correlation between the level of training of accounting cadres on digital systems and improving the quality of financial performance and IS. The study proved that good training in the use of digital systems contributes to reducing errors and improving the handling of accounting data safely and systematically.

4- Iraqi banks are still facing real challenges in the application of DA. The most prominent obstacles include poor technological infrastructure, lack of qualified cadres, and high costs of digital transformation. These challenges are an obstacle to the mainstreaming of inclusive digital transformation across all banking institutions.

5- Digital transformation in accounting enhances the ability of banks to prepare real-time financial reports and analyze strategic data. Reliance on modern software has improved processing speed

and access to accurate real-time information, facilitating more effective financial decisions at the operational and strategic level.

4.2 Recommendations:

- 1- The need to accelerate the development of technological infrastructure within Iraqi banks. Effective digital transformation requires an advanced technical environment that includes secure communication networks and highly efficient servers, which contributes to supporting the efficient application of DA systems.
- 2- Intensifying training and professional qualification programs for accounting cadres in the field of DA. Banks should invest in human capacity building by organizing continuous specialized courses in the use of accounting software and IS to reduce reliance on traditional methods.
- 3- Adopting comprehensive and integrated IS policies. Advanced strategies should be put in place to protect financial data, including the implementation of modern encryption systems, the modernization of firewalls, and the activation of multi-factor verification systems to ensure that information is protected from cyber threats.
- 4- Relying on accounting systems compatible with international standards. It is advisable to use accounting software that supports compliance with International Financial Reporting Standards (IFRS) and (ISA) to enhance confidence among investors and external auditors.
- 5- Stimulating investment in digital transformation through tax or financing incentives. The Iraqi government or the Central Bank of Iraq can provide financial or tax facilities to banks that are committed to the comprehensive digital transformation in their accounting systems, which will enhance the speed and efficiency of this transformation.

References:

1. Brown, A. (2022). "Emerging Trends in Digital Accounting". *Journal of Business Innovation*, 9(2), 45-67.
2. Chen, X. (2020). "Adopting Digital Accounting: A Practical Approach". 2nd Edition, Springer, Germany.
3. Gupta, S. & Sharma, R. (2021). "The Future of Accounting: Digital Innovations in Financial Reporting". *International Journal of Accounting and Finance*, 20(1), 88-105.
4. Jindal, P. & Rathi, R. (2023). "Digital Accounting: Innovations and Challenges". *Journal of Digital Finance*, 18(2), 110-122.
5. Kogan, L. & Kogan, A. (2023). "Digital Accounting and Its Impact on Financial Reporting". *Journal of Financial Technology*, 15(3), 234-256.
6. Kumar, A. & Mehta, P. (2024). "Efficiency of Real-Time Financial Reporting in Digital Accounting". *Journal of Finance and Technology*, 19(1), 40-54.
7. Lee, M. & Kim, Y. (2021). "Cybersecurity in Digital Accounting: Challenges and Opportunities". *Journal of Accounting Technology*, 12(4), 175-193.
8. Parker, D. (2023). "Digital Transformation in Accounting". 1st Edition, Wiley Publishing, United States of America.
9. Patel, R. & Mishra, S. (2023). "Digital Tools for Financial Data Integrity". *International Journal of Financial Technology*, 11(3), 89-103.
10. Rani, S. & Singh, R. (2024). "Analysis Tools in Digital Accounting for Better Decision Making". *Journal of Strategic Accounting*, 10(2), 60-73.

11. Sharma, N. & Joshi, M. (2023). "Cloud-Based Accounting and Financial Transparency". Accounting Review Journal, 20(5), 110-125.
12. Singh, R. & Verma, S. (2022). "Automated Financial Reporting and its Efficiency". International Journal of Accounting Systems, 15(4), 60-72.
13. Smith, J. (2022). "The Role of Digital Accounting in Financial Security". Finance and Security Review, 7(2), 100-118.