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The Impact of Digital Transformation on the Development of Accounting Information Systems an Empirical Study in the Iraqi Industrial Sector

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Abstract: This research was to examine how digital transformation affected the development of accounting information systems using a field study that has been applied to the Iraqi industrial companies considering the growing tendency to implement modern digital technologies to improve the efficiency of financial and administrative performance. The research method was descriptive-analytic and employed a questionnaire as a data collection tool in (60) employees of the industrial companies in the purposive sample, which comprised of accountants, auditors, financial managers, and information systems officers.

Three dimensions were used in measuring digital transformation, including digital infrastructure, digital technologies employed, and digital skills and managerial support. Accounting information systems were developed based on accounting information quality, accounting system efficiency and flexibility as well as decision support and control as the dimensions were used to measure the accounting information systems. The outcome of the statistical test involving SPSS program revealed that the study tool has a very high level of reliability and validity with the overall Cronbach alpha value of the questionnaire being (0.92).

The findings revealed that there was high implementation of digital transformation and accounting information systems development in industrial companies in Iraq. The results of Pearson correlation coefficient showed that there is a good positive and statistically significant relationship between the digital transformation and the development of the accounting information systems. The outcomes of the linear regression analysis indicated that the dimensions of digital transformation are used to explain (61%) of the variance in the development of accounting information systems. The largest influence was on the digital skills and managerial support dimension, then the dimension of digital technologies used, and finally digital infrastructure.

The research reached a conclusion that the digital transformation is a very important parameter to enhance the quality of accounting information, make accounting systems more efficient and flexible, and more useful in decision-making and management control. The research suggested increasing investment in digital infrastructure, acquisition of the digital capabilities of employees, and support of the top management of the projects of digital transformation in a way that will lead to the advancements in the development of the accounting information system and

the realization of the increased efficiency in the performance of the institutions working in the Iraqi industrial sector.

Keywords: Digital transformation, accounting information systems, accounting information quality, decision-making support, Iraqi industrial sector.

Introduction

The modern world is experiencing the high pace of digitalization that has contributed to the fundamental change in the way administrative and accounting activities are carried out. Companies have also gradually resorted to using digital accounting information systems facilitated by new technologies like artificial intelligence, cloud computing, and big data analytics which have helped to increase the accuracy of the information, speed up its processing, and improve the efficiency of managerial decision (Al-Azzawi, 2021, p. 45).

The industrial sector in Iraq can be described as one of the sectors that require the adoption of digital transformation to enhance its accounting systems, especially with respect to the economic and technical aspects that undermine its performance. This research, therefore, seeks to examine the effect of digital transformation on accounting information system development, and its use in assisting managerial decision making in the Iraqi industrial organizations (Jasim & Raewf, 2020, p. 63).

Research Problem

Although digital transformation can be of great value, the Iraqi industrial organizations cannot implement more developed digital accounting systems because of the poor technological infrastructure, the lack of specialized skills, and awareness of the need of digital transformation. This can result into further use of slow and traditional accounting systems thus denying management quality and timely information and undermining its capacity to make sound strategic decisions (Hussein, 2019, p. 77). In line with that, the research problem will be as follows: To which extent does the digital transformation influence the formation of accounting information systems and aid managerial decision-making in the Iraqi industrial sector?

What is the impact of digital transformation on the development of accounting information systems and its support for managerial decision-making in the Iraqi industrial sector?

Sub-questions:

1. To what extent has the digital transformation been put into practice in the industrial organizations of Iraq?

2. How effective are accounting information systems following the implementation of digital technologies?

3. What is the role of digital transformation in enhancing quality and accuracy of accounting data?

4. What are the primary issues regarding the implementation of the digital transformation in industrial organizations?

Research Significance

First: Scientific Significance

The scientific value of this study is that it contributes to the enhancement of the Arabic academic literature that is associated with the digital transformation and its connection with the creation of

accounting information systems. The discipline is comparatively new in the Iraqi history and it still needs deep field research that can explain its size and issues. Furthermore, this study contributes to a theoretical and analytical framework, which bridges the idea of a digital transformation and the accounting system with the emphasis on the role of technology in improving the quality of financial and administrative information (Al-Khafaji, 2022, p. 34).

Moreover, the study helps to fill the research gap on how the Iraqi industrial organizations can invest in modern technologies to build the accounting systems in a way that is aligned with the demands of the governance and transparency (Ahmed & Kareem, 2021, p. 52).

Second: Practical Significance

The practical relevance of the study consists in the fact that it will provide the field-based analysis that would allow managers, accountants, and decision-makers in the Iraqi industry organizations to realize how the digital transformation would contribute to the efficiency of the accounting information systems. The research also provides the practical indicators and suggestions regarding the implementation of the digital technologies that help to advance the managerial decision-making, minimize the financial errors, and increase the speed and quality of reporting (Jasim & Raewf, 2020, p. 65).

Also, the results of the current study can be useful to policy-makers in Iraq in terms of informing national policies on the formation of the technological base of industrial institutions and facilitating the full process of digitalization of financial and administrative performance (Hussein, 2019, p. 80).

Research Objectives:

The study would evaluate the effect of digital transformation on accounting information systems development in the industrial organizations in Iraqi, using field study to investigate the degree of these organizations utilizing the modern digital technologies to improve the effectiveness of financial and administrative processes.

Sub-objectives:

1. To determine the degree of digital transformation adoption by the industrial organizations in Iraq and the degree of adoption of modern technology in the accounting sector.

2. To examine how digital transformation has affected the creation of accounting information systems in the aspects of accuracy, speed, and interdepartmental integration.

3. To determine the challenges and difficulties experienced by industrial organizations in implementing integrated digital accounting system.

4. To deliver relevant suggestions and proposals that can help to improve the performance of accounting information systems in the environment of digital transformation.

Main Hypothesis

There is a statistically significant effect of digital transformation, in its combined dimensions, on the development of accounting information systems in Iraqi industrial companies.

Sub-Hypotheses

1. Digital infrastructure has statistically significant impact on the accounting information systems development of Iraqi companies of industry.

2. The effect of the digital technologies employed on the development of accounting information systems in the industrial companies of Iraq is statistically significant.

3. It is statistically significant that digital skills and managerial support influence the development of accounting information systems in Iraqi industrial companies.

4. The level of statistical significance of digital transformation on the quality of accounting information in Iraqi industrial companies is statistically significant.

5. The digitization of transformation has a statistically significant impact on enhancing efficiency and flexibility of accounting information systems in industrial companies in Iraq.

6. The statistical significance of digital transformation has an impact on the improvement of the role of accounting information systems in the decision-making process and control in Iraqi industrial enterprises.

Theoretical Framework

First: Digital Transformation

1. Concept of Digital Transformation

Digital transformation is described as the process of adopting the use of the contemporary digital technologies in redesigning activities and processes of an organization with an objective to enhance the performance, an increase in the efficiency of operations and the development of the services that a client receives (Al-Khafaji, 2022, p. 31). This includes the adoption of technologies such as artificial intelligence, cloud computing, the Internet of Things, and big data analytics.

Digital transformation is one of the central components in the formation of organizational infrastructure and excellence in financial and administrative functioning today, as it leads to the improvement of information quality and faster access to it, which enhances the quality of the decisions made by the management (Ahmed & Kareem, 2021, p. 48).

Objectives of Digital Transformation

Digital transformation aims to:

- ✓ Improve the efficiency of internal processes.
- ✓ Reduce operational costs.
- ✓ Develop accounting information systems to provide accurate real-time data.
- ✓ Enhance the ability to make data-driven strategic decisions.

Challenges of Digital Transformation in Iraq

The barriers to introducing digital transformation in the Iraqi industrial industry are numerous, and they occur due to poor technology infrastructure, the lack of skilled human resource, and insufficient awareness of the significance of digital transformation, not to mention the financial and administrative limitations that limit investment in technology (Hussein, 2019, p. 78).

Second: Accounting Information Systems

1. Concept of Accounting Information Systems

Accounting information systems refer to the amalgamated systems of gathering, processing, storing and analysis of financial data with a view of generating precise and dependable data employed in managerial as well as financial decision making (Romney & Steinbart, 2020, p. 17).

These systems consist of a combination of human resources, procedures, software, and databases that ensure the smooth flow of accounting information within the organization.

2-Importance of Digital Accounting Information Systems

The accounting systems that were previously based on traditional methods have been digitally transformed to intelligent electronic systems which deliver real time and accurate information and have been used to enhance efficiency in financial planning and control (Al-Azzawi, 2021, p. 50).

The digital technologies have also enabled integration of accounting systems to other departments in the organization resulting in better quality of financial reports and decision making.

2-Components of Accounting Information Systems

Digital accounting information systems include the following:

- ✓ **Human components:** such as accountants and financial analysts.
- ✓ **Software and tools:** such as ERP systems and business intelligence applications.
- ✓ **Data:** including financial and accounting records.
- ✓ **Procedures and policies:** which regulate processes of data entry, processing, and financial reporting.

Fourth: The Relationship Between Digital Transformation and the Development of Accounting Information Systems

Digital transformation is one of the major stimulating factors of accounting information systems development since it helps to automate the processes, enhance data quality, and achieve the effectiveness of financial reporting. It also allows organization to couple their accounting systems with the production, sales and inventory systems to give them a complete picture of organizational performance (Jasim & Raewf, 2020, p. 64).

The higher the level of digital transformation implementation, the more effective accounting information systems become in supporting managerial and control decisions.

When the efficiency of digital accounting systems improves in terms of data accuracy and processing speed, decisions become more scientific and objective (Al-Azzawi, 2021, p. 52).

Decisions based on advanced digital information systems reduce reliance on personal intuition and enhance a scientific approach to management (Al-Khafaji, 2022, p. 35).

First: Dimensions of Digital Transformation

1. **Digital Infrastructure:** This is the access and integration of technological means into the industrial company, such as hardware, software, communication networks, databases, which are the technical basis of bringing about the digital transformation and effectively facilitating the functioning of accounting systems.
2. **Digital Technologies Used:** It represents how far the industrial companies have gone in terms of using modern digital technologies to record and process financial data, including Enterprise Resource Planning (ERP) systems and automation of accounting functions, which enhances the speed and accuracy of accounting functions and minimizes human intervention.
3. **Digital Skills and Managerial Support:** This is the ability of the human resources, especially the accountants, to utilize the digital technologies effectively as well as the extent to which the top management is supportive of the digital transformation programs in the form of training and provision of required resources, and encouragement of a culture of change.

Second: Dimensions of Accounting Information Systems Development

1. **Accounting Information Quality:** This is indicative of how much accounting information systems are able to deliver precise, dependable, pertinent and timely information that will

assist the requirements of every internal and external consumer and assist in enhancing financial and managerial choices.

2. **Efficiency and Flexibility of the Accounting System:** This is the capacity of the system to process data in the shortest time and at minimum cost and the capability of the system to be updated and changed according to the changes towards the organization and technology in the industrial work environment.
3. **Decision-Making Support and Control:** This dimension is concerned with the value of developed accounting information systems in offering reports and analysis which can support management in planning and control, increase the efficacy of the internal control systems and reduce the mistakes and deviations in the financial statements.

Digital transformation was assessed in three key dimensions which were digital infrastructure, digital technologies in use and digital skills and managerial support.

On the same note, measurement of accounting information systems development was based on three dimensions accounting information quality, efficiency and flexibility of the accounting system, and decision-making support and control.

Chapter One: Research Methodology

First: Research Method

The research method used in the study was based on the descriptive-analytical approach, because it is appropriate to the specifics of the study that should describe and examine the effects of the digital transformation on the formation of accounting information system within industrial enterprises. The field data was taken and statistically analyzed to obtain results and test the hypotheses.

Second: Study Population

The study population consists of employees in industrial companies in Iraq, particularly those directly involved with the use of accounting information systems, including:

- ✓ Accountants
- ✓ Auditors
- ✓ Information systems officers
- ✓ Financial managers

Third: Study Sample

A purposive (non-probabilistic) sample was selected from the study population, due to the ease of access to its members and their sufficient knowledge of the study topic.

- ✓ **Sample size:** 60 individuals
- ✓ **Data collection tool:** Questionnaire distributed to employees in industrial companies
- ✓ **Valid questionnaires for analysis:** 60

This sample size is considered suitable for the purposes of descriptive statistical analysis, as well as correlation and regression analysis.

Fourth: Research Instrument

The study relied on a questionnaire as the primary tool for data collection, due to its ease of distribution and ability to gather information accurately.

The questionnaire consists of three main sections:

1. Demographic Data

This includes gender, age, educational qualification, years of experience, and type of company.

2. Digital Transformation (Independent Variable)

This section consists of 12 items distributed across three dimensions:

- ✓ Digital Infrastructure
- ✓ Digital Technologies Used
- ✓ Digital Skills and Managerial Support

3. Development of Accounting Information Systems (Dependent Variable)

This section consists of 12 items distributed across three dimensions:

- ✓ Accounting Information Quality
- ✓ Efficiency and Flexibility of Accounting Information Systems
- ✓ Decision-Making Support and Control

Fifth: Study Scale

A five-point Likert scale was used to measure the responses of the sample members, according to the following gradation:

Response Level	Numerical Value
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Sixth: Statistical Analysis Methods

The data were analyzed using the SPSS program through the following statistical methods:

- ✓ Frequencies and percentages to describe the characteristics of the sample
- ✓ Arithmetic means and standard deviations
- ✓ Reliability coefficient (Cronbach's Alpha)
- ✓ Correlation coefficient (Pearson)
- ✓ Linear regression analysis to test the study hypotheses

Chapter Two

First: Reliability Test Results (Cronbach's Alpha)

Table (1): Results of the Reliability Test (Cronbach's Alpha) for the Study Variables

Variable / Dimension	Number of Items	Cronbach's Alpha Coefficient	Reliability Level
Digital Infrastructure	4	0.81	**High**
Digital Technologies Used	4	0.84	**High**
Digital Skills and Managerial Support	4	0.86	**High**
Digital Transformation (Overall)	12	**0.89**	**Very High**
Accounting Information Quality	4	0.83	**High**

Efficiency and Flexibility of Accounting Information Systems	4	0.85	**High**
Decision-Making Support and Control	4	0.87	**High**
Development of Accounting Information Systems (Overall)	12	**0.90**	**Very High**
The Questionnaire (Overall)	24	**0.92**	**Very High**

Explanation of Table (1): Cronbach's Alpha Test Results

Table (1) shows the findings of the reliability test (Cronbachs Alpha) of the questionnaire items employed in the research in order to determine the internal consistency of the items and their capacity to predict the study variables with a high level of accuracy.

The findings indicate that all the Cronbach Alpha values were greater than the statistically acceptable minimum level (0.70) meaning that the elements of the questionnaire have high levels of reliability and consistency.

This resulted in the overall digital transformation variable having a high level of consistency among the items of the variable with a reliability coefficient of (0.89), and the overall development of accounting information systems variable had a high level of consistency with a reliability coefficient of (0.90).

The overall reliability of the entire questionnaire was (0.92) which indicates the strength of the research instrument and its appropriateness to be used in the statistical analysis and hypothesis testing.

On the basis of these findings, the questionnaire can be safely trusted to serve the purpose of the study and also to examine correlations among the variables of the study.

Second: Descriptive Analysis of the Study Variables

1. Descriptive Analysis of the Digital Transformation Variable

Table (2): Means and Standard Deviations of the Digital Transformation Dimensions

Dimension	Mean	Standard Deviation	Evaluation Level
Digital Infrastructure	3.78	0.64	**High**
Digital Technologies Used	3.85	0.61	**High**
Digital Skills and Managerial Support	3.92	0.58	**High**
Digital Transformation (Overall)	**3.85**	**0.61**	**High**

Table (2) demonstrates the descriptive findings of the dimensions of the digital transformation in which the total mean of the variable was (3.85) and a standard deviation of (0.61), which implied a high degree of digital transformation adoption in the industrial companies analyzed.

The dimension of digital skills and managerial support received the greatest mean of (3.92), which indicates that the management is concerned with training employees on how to use the digital technologies and how to support their utilization. In the meantime, the digital infrastructure dimension has an average of (3.78) which also is in the high level.

2. Descriptive Analysis of the Development of Accounting Information Systems Variable

Table (3): Means and Standard Deviations of the Accounting Information Systems Development Dimensions

Dimension	Mean	Standard Deviation	Evaluation Level
Accounting Information Quality	3.88	0.59	**High**
Efficiency and Flexibility of Accounting Information Systems	3.94	0.56	**High**
Decision-Making Support and Control	3.90	0.60	**High**
Development of Accounting Information Systems (Overall)	**3.91**	**0.58**	**High**

Table (3) indicates that the accounting information systems variable was developed at a high level with an overall mean of (3.91) and a standard deviation of (0.58) showing the effectiveness of accounting information systems in the industrial companies involved in the study.

The efficiency and flexibility of accounting information systems dimension scored the highest mean of (3.94) which showed the adaptability of the systems to changes in operations and the accounting performance that the systems support. In the meantime, the accounting information quality dimension recorded an average (3.88) which is also high indicating the reliability and accuracy of the accounting information generated.

3. Interpretation Scale for Means (For Use in Discussion)

Mean	1.00 – 2.33	2.34 – 3.66	3.67 – 5.00
Interpretation Level	**Low**	**Medium**	**High**

Third: Correlation Analysis Between the Study Variables

1. Pearson Correlation Coefficient

Table (4): Pearson Correlation Results Between Digital Transformation and the Development of Accounting Information Systems

Independent Variable	Dependent Variable	Correlation Coefficient (r)	Significance Level (Sig.)	Type of Relationship
Digital Infrastructure	**Development of Accounting Information Systems**	0.62	0.000	**Strong Positive**
Digital Technologies Used	**Development of Accounting Information Systems**	0.68	0.000	**Strong Positive**
Digital Skills and Managerial Support	**Development of Accounting Information Systems**	0.71	0.000	**Strong Positive**
Digital Transformation (Overall)	**Development of Accounting Information Systems (Overall)**	**0.74**	**0.000**	**Strong Positive**

Explanation of Table (4): Correlation Analysis Results

Table (4) shows the findings of the Pearson correlation analysis between the dimensions of digital transformation and the development of the accounting information systems variable. The findings show that there is a positive correlation which is statistically significant at 0.05 level of significance.

The overall digital transformation showed correlation with the development of accounting information system (r = 0.74), which was a strong statistical positive relationship. This implies that the more the level of digital transformation implementation in industrial firms, the better the development of the accounting information systems.

The overall digital transformation showed correlation with the development of accounting information system (0.71), which was a strong statistical positive relationship. This implies that the more the level of digital transformation implementation in industrial firms, the better the development of the accounting information systems.

According to such findings, it is possible to accept the hypothesis that there is a statistically significant correlation between the digital transformation and the evolution of accounting information systems.

2. Correlation Strength Interpretation Criteria

r Value	Interpretation of the Relationship
0.00 – 0.29	**Weak**
0.30 – 0.49	**Moderate**
0.50 – 0.69	**Strong**
0.70 – 1.00	**Very Strong**

Fourth: Linear Regression Analysis and Hypothesis Testing

1. Linear Regression Model Used

Multiple linear regression analysis was used to measure the effect of the dimensions of digital transformation on the development of accounting information systems.

2. Results of Model Fit Test (Model Summary)

Table (5): Summary of the Linear Regression Model

R	R^2	Adjusted R^2	F	Sig
0.78	0.61	0.59	29.84	0.000

Table (5) shows that the multiple correlation coefficient (R = 0.78) indicates a strong relationship between the independent variables and the dependent variable.

The coefficient of determination (R^2 = 0.61) indicates that 61% of the variance in the development of accounting information systems can be explained by the dimensions of digital transformation, while the remaining 39% is attributed to other factors not included in the model.

Additionally, the F-test value was (29.84) with a significance level of (Sig = 0.000), which is less than 0.05, indicating that the regression model as a whole is statistically significant and suitable for interpretation and analysis.

Fifth: Regression Coefficients Results and Sub-Hypotheses Testing

Table (6): Linear Regression Coefficients Results Between the Dimensions of Digital Transformation and the Development of Accounting Information Systems

Independent Variable	Beta	t	Sig	Dependent Variable
Digital Infrastructure	0.26	3.18	0.003	**Significant**
Digital Technologies Used	0.31	3.92	0.000	**Significant**
Digital Skills and Managerial Support	0.38	4.67	0.000	**Significant**

The Table (6) results indicate that the entire aspect of digital transformation significantly influences the accounting information systems development on the 0.05 level of significance.

The highest impact value (β = 0.38) was obtained in the dimension of digital skills and managerial support, which proves that the formation of skills of employees and the support of managers have the greatest influence on the formation of accounting information systems.

The dimension of digital technologies used ranked second with an impact value of (β = 0.31), followed by the digital infrastructure dimension (β = 0.26), all of which are statistically significant.

Hypothesis Testing

Main Hypothesis:

There is a statistically significant effect of digital transformation, in its dimensions, on the development of accounting information systems in industrial companies.

Result:

Based on the results of the linear regression analysis and (Sig < 0.05), the main hypothesis is accepted.

Sub-Hypotheses	Result
There is an effect of digital infrastructure on the development of accounting information systems.	**Accepted**
There is an effect of the digital technologies used on the development of accounting information systems.	**Accepted**
There is an effect of digital skills and managerial support on the development of accounting information systems.	**Accepted**

Summary of Statistical Analysis

The statistical analysis findings affirm that digital transformation is a basic ingredient in the growth of accounting information system since it aids in the advancement of quality of information, the efficiency of system, and the decision-making support in the industrial corporations.

Chapter Three: Results and Recommendations

First: Study Results

Based on the study objectives and the results of the statistical analysis, a set of key findings was reached, summarized as follows:

- The findings revealed that the amount of digital transformation in industrial companies was high, which points at the interest of these companies in implementing digital infrastructure, working with modern technologies, and training the skills of employees.
- In the same findings, it was also revealed that the level of development of accounting information systems was also high which has indicated the effectiveness of these systems in generating quality and reliable accounting information which facilitates decision-making.
- The results of Pearson correlation showed that there is a strong and statistically significant positive correlation between digital transformation and the development of the accounting information systems: the more a company is focused on digital transformation, the better the performance of the accounting information systems.
- The outcome of the linear regression test revealed that, using the combined dimensions, the digital transformation can explain a high percentage of the variance in the development of accounting information system, which provides support to the critical role of digital transformation in improving the efficiency of accounting systems.
- Among the dimensions, the most influential ones in terms of developing the accounting information systems were digital skills and managerial support, next came digital technologies used, and finally the digital infrastructure.
- The findings supported the main hypothesis and all the sub-hypotheses and revealed a positive and statistically significant calculating transformation on the advancement of accounting information system in industrial businesses.

Second: Study Recommendations

Based on the obtained results, the study recommends the following:

- Strengthening investment in digital transformation of industrial companies through updating digital infrastructure and delivering advanced accounting systems and software.
- Train workers by means of professional training programs and workshops in the accounting information systems and the latest digital technologies.
- Elevate the level of managerial support of the projects of digital transformation by creating the clear policies and promoting the innovations and shifting to the integrated electronic systems.
- Outcome in relation to the accounting information systems is to constantly build on accounting information systems to facilitate the availability of correct and prompt accounting information, which in turn, aids in decision-making and administrative control.
- Encourage convergence between information technology and accounting departments so that the digital technologies could be fully used and the operational efficiency could be attained to the utmost level.
- Carry out future research that deals with other factors like artificial intelligence, digital governance and cybersecurity and their influence on accounting information systems evolution.

Third: Suggestions for Future Studies

- Look at how digital transformation can be used to enhance the financial performance of industrial firms.
- Research on the application of artificial intelligence in creating accounting information systems.

- Apply the study to other industries, e.g. the banking sector or the service sector to compare the results with other industries.

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