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Research Article

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The Impact of Digital Transformation on Institutional Performance Efficiency Using Management Information Systems (MIS)

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Abstract: This period is marked by a huge process of transformation involving the digital revolution to a large extent, thus influencing the performance of institutions within various economic sectors, in which management information system has a significant role. The study begins with an introductory question concerning the level of influence of digital transformation through the use of management information system on the performance of institutions within the Iraqi economic sector. Descriptive analysis was the primary research methodology used while a questionnaire consisting of 28 questions was created for distribution among 55 individuals working in Iraqi economic institutions. The findings indicate that digital transformation in terms of management information systems positively influences the performance efficiency of institutions statistically, where the arithmetic mean obtained was 3.91 out of 5.00 with a standard deviation of 0.67. The t-test confirmed the existence of statistically significant differences at the 0.05 level between the arithmetic mean and the hypothesized mean, in favor of the former. The study concluded with a set of recommendations, most notably: the need to adopt integrated strategies for digital transformation, develop human resource competencies in the field of management information systems, and foster a culture of digital transformation within organizations.

Keywords: Digital transformation, management information systems, organizational performance efficiency, digital governance, e-government, organizational transformation.

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1. Introduction to the Research

Research Problem

Digital transformation in today's world is one of the most influential phenomena in the business environment. Global estimates indicate that the volume of investments in digital transformation worldwide exceeded $2.3 trillion in 2023, and is expected to rise to $3.4 trillion by 2026 (IDC, 2023). In the context of this accelerating transformation, management information systems emerge as the technical and organizational foundation that enables organizations to leverage modern digital technologies to improve their operations, decision-making, and overall institutional performance.

However, the institutional reality in the Iraqi environment reveals a significant gap between stated digital ambitions and successful actual implementation; Many organizations suffer from poor integration of management information systems with their operational strategies, limited human resource capabilities in handling digital tools, and the absence of a clear vision for managing digital transformation in a way that achieves a tangible impact on institutional

performance. In light of this reality, the main research problem is formulated as follows:

To what extent does digital transformation using management information systems impact the efficiency of institutional performance in Iraqi economic organizations?

This primary research question leads to several secondary research questions, which include the following:

A. What is the extent of use of management information systems in aiding digital transformation in the firms being examined?

B. What is the correlation between the extent of integration of management information systems and the extent of improvement in institutional performance measures?

C. What are the most important obstacles encountered by Iraqi firms when applying digital transformation via management information systems?

D. What are the most critical aspects of management information systems affecting institutional performance efficiency?

Significance of the Study

The relevance of this research arises due to its connection between the theoretical and practical dimensions. On the theoretical side, this study contributes to the knowledge of a relatively understudied area within the scope of specialized Arabic scientific literature, which is the integrative connection between digital transformation, management information systems, and performance efficiency of institutions in Iraq. This research will contribute to the development of the research framework that can be used as a basis for future researches on this topic.

As for practical value, the results of this study have direct practical implications that can be applied in the development of digital transformation strategies for economic organizations. Moreover, the importance of the study can be assessed within the context of strategic priorities of the Iraqi government, which is oriented towards the creation of a digital economy and e-governance in both public and private sectors.

Finally, this research has great importance due to the timeliness. In other words, the problem chosen for study arises because of the fact that Iraqi organizations need to understand the essence of the fourth industrial revolution and make changes to their institutions according to the new conditions.

Research Objectives

The main objectives of this research are:

1. To quantify the effect of digital transformation by way of management information systems on the efficiency of performance within Iraqi economic institutions.

2. To identify how widely management information systems for digital transformation have been adopted within Iraqi institutions and any gaps therein.

3- Identifying the most significant dimensions of management information systems that have the greatest impact on institutional performance efficiency.

4- Revealing the most significant institutional, technical, and human obstacles hindering the digital transformation process in the organizations under study.

5- Providing practical recommendations based on statistical evidence for institutional decision-makers in the field of digital transformation.

Research Hypotheses

Based on the research problem, objectives, and relevant theoretical literature, this study adopts the following hypotheses:

Main Hypothesis:

There are no statistically significant differences between the arithmetic mean of the research sample's responses and the hypothesized mean regarding the impact of digital transformation using management information systems on institutional performance efficiency at the significance level (0.05).

Sub-hypotheses:

First sub-hypothesis: There is no statistically significant effect of decision support systems on organizational performance efficiency at the 0.05 significance level.

Second Sub-Hypothesis: There is no statistically significant effect of electronic data processing systems on improving the operational efficiency of organizations at the significance level (0.05).

Third Sub-Hypothesis: Strategic information systems do not contribute to enhancing the competitive advantage of organizations at the significance level (0.05).

Scope of the Study

1. Thematic Scope: This study is limited to the impact of digital transformation through management information systems on institutional performance efficiency and does not address technical aspects, such as information technology infrastructure, in detail.

2- Human Scope: Managers and employees at the middle and upper management levels in the economic organizations under study.

3- Geographical Scope: A number of government, mixed, and private economic organizations in Al-Qadisiyah Governorate and neighboring governorates.

4- Temporal scope: The academic year (2024–2025).

Definition of Research Concepts

1- Digital Transformation:

A- Matzner & Hübner : Defined it as the comprehensive and strategic transformation process an organization undergoes by employing digital technologies to reengineer its business models, processes, culture, and customer experience, leading to the creation of new and sustainable value and the achievement of a competitive advantage in a rapidly changing business environment [1].

B- Organization for Economic Cooperation and Development (OECD, 2019): Described digital transformation as the integration of digital technologies across all economic and social activities, bringing about radical changes in how goods and services are produced, marketed, and distributed, as well as in the nature of organizational structures and institutional working patterns [2].

2. - Management Information Systems (MIS):

a. Laudon & Laudon : defined management information systems as computerized systems that collect, process, store, and distribute data to support management control, decision-making, and the coordination of organizational activities, and that integrate with organizational strategies and processes to improve overall organizational performance [3].

B- O'Brien and Marakas O'Brien & Marakas : Information systems that provide valuable and relevant information in a timely manner to various management levels, enabling them to perform their supervisory, planning, and organizational functions with high effectiveness [4].

3- Institutional Performance Efficiency:

A- Kaplan & Norton : An organization's ability to achieve its overall strategic, operational, financial, and competitive objectives through the optimal use of available resources, while maintaining quality and sustainability standards in a volatile business environment [5].

B. Porter (2008): It is the extent to which an organization achieves value-added results relative to its investment in inputs and resources, measured by integrated indicators that include productivity, profitability, quality, and organizational satisfaction [6].

Previous Studies

Arabic Studies

1- Al-Obaidi and Al-Rabie : "The Role of Management Information Systems in Achieving Competitive Advantage in Iraqi Manufacturing Companies."

The primary goal of this research is the identification of the link between the extent of the implementation of management information systems and competitive advantage in Iraqi manufacturing companies [7]. A descriptive-analytical approach has been employed in this investigation. A total of 60 managers have participated in this survey. As a result, it has been found out that management information systems account for 62% of changes in competitive advantage variables. Decision support systems have the strongest influence on competitive advantage.

2- Study by Al-Shimari & Al-Amri : "Digital Transformation in Iraqi Government Agencies and Its Influence on Service Quality."

The main objective of this study was the assessment of the level of digital transformation in Iraqi government agencies and the impact of digital transformation on the quality of services provided. It has been identified that 58% of government agencies have no digital vision [8]. The key obstacles for digital transformation include the lack of adequately skilled staff and underdeveloped infrastructure. In addition, the adoption of integrated ERP systems allowed for a 39% improvement in service quality parameters.

3- Zidan & Mahmoud's study: "The Influence of Decision Support Systems Based on Digital Transformation on Administrative Performance in Jordanian Commercial Banks." [9].

The present study was conducted in order to examine the influence of decision support systems through digital transformation on administrative performance in the banking sector. The instruments of questionnaires and interviews were used for the purposes of data gathering among 75 managers. As per the results, advanced decision support systems managed to reduce the duration of decision making process by 47%, whereas improved IT capabilities in commercial banks resulted in high levels of performance.

International Studies

Westerman et al., "Leading Digital: Transforming Business through Technology"

The comprehensive study included an analysis conducted on a survey of more than 400 leading organizations globally, assessing the link between digital maturity and organizational success [10]. The results obtained indicate that businesses demonstrating high digital maturity generate revenues at the level of 26% higher and profitability 12% higher than their low-digital maturity peers.

2- Study conducted by Bharadwaj et al.: "Digital Business Strategy: Toward a Next Generation of Insights"

This research involved the development of a novel theoretical perspective for digital strategies while proving that the alignment of digital strategies with the management information systems was key to organizational success in a digital economy era [11]. It revealed that those firms which make use of big data in an integrated management information system context perform better.

3- Study conducted by Li et al.: "Digital Transformation and Business Performance: The Role of MIS Integration"

The study analyzed the causal effect between digital transformation and organizational performance where management information systems were acting as mediators and found out that there was a strong positive relation between the level of MIS integration and performance of firms [12]. In this context, 73% of successful digital transformations belonged to those firms with sophisticated MIS.

The Current Study's Position Relative to Previous Studies

However, based on the earlier studies analyzed, it is evident that there are various aspects under which the present research work is distinguishable from other earlier research works in terms of its uniqueness; for example, in relation to the environment in which the research is undertaken, it is clear that the present research work is distinctive in the sense that it is concerned with the Iraq environment [13]. In addition to that, it is based on data that applies to this particular environment. Another aspect is the application of a holistic theoretical framework that integrates all the variables concerning information systems management and institutional performance measures [14].

Theoretical Framework

The Concept of Digital Transformation and Its Dimensions

The notion of digital transformation is not something that sprang up out of nowhere in the management literature; on the contrary, it is a continuously evolving and accelerating phenomenon that responds to the quickening tempo of technology innovations [15]. The scholarly engagement in this phenomenon started with the Internet revolution at the turn of the millennium, was further fueled by the advent of cloud computing and 3G/4G telecommunication infrastructure, and finally peaked with the maturity of artificial intelligence, big data analytics, and IoT technologies in the early 2020s.

There is consensus among scholars that digital transformation unfolds along four distinct yet interrelated dimensions:

1. Business Model Transformation: It refers to the fundamental redesign of the underlying business model in order to benefit from the digital opportunities that may range from the creation of new digital sales channels to building data-driven products and services.

2. Operational transformation: It refers to the automation of repetitive tasks, digitization of value chains, and the use of digital analytics in order to increase operational efficiencies.

3. Customer/stakeholder experience transformation: It aims at improving the experience of

interacting with all stakeholders through the use of digital tools.

4. Cultural and organizational transformation: It refers to establishing an organizational culture that supports digital innovation and adopting organizational structure that is conducive for continuous digital innovations.

Types of Management Information Systems Supporting Digital Transformation

Management information systems represent an integral group of technological and administrative mechanisms that facilitate digital transformation in different organizational layers. There are five primary management information systems:

1-Transaction Processing System (TPS): This type of system immediately performs day-to-day transactions, like sales, purchasing, and payroll, and serves as the source of data for higher-level systems.

2-Decision Support System (DSS): These include sophisticated models and simulations that allow managers to examine the potential results of different alternatives before making a decision in an intricate and unstructured environment.

3-Executive Information Systems (EIS): The strategic dashboards through which executives monitor key metrics to make well-grounded strategic decisions.

4-Enterprise Resource Planning Systems (ERP): Systems designed to integrate all the organizational processes into a single entity encompassing finance, personnel, manufacturing, marketing, procurement, etc.

5-Customer Relationship Management (CRM) Systems: Systems that collect and analyze customer data to foster loyalty and boost revenue.

The Impact of Management Information Systems on Organizational Performance Efficiency

The management information system affects organizational efficiency in performance in three different ways, namely [3]:

A. Through operational route: It increases the efficiency of business operations by automating them, avoiding human mistakes, speeding up work processes, and cutting down operational expenses.

B. Through informational route: It enhances the quality of information available to management, thus improving the decision-making process at all levels of management.

C. Through strategic route: It enables strategic analysis and analysis of the external environment, identifying opportunities and threats.

2. Research Methodology and Field Procedures

Research Methodology

The descriptive and analytical methods were chosen as the core methodological basis for the research since they fit the character of the research problem that presupposes the description of the phenomenon under study and its analysis as well as the measurement of the numerical characteristics associated with this phenomenon.

Research Instrument

The questionnaire that consists of 28 items categorized under four general themes was developed based on theoretical concepts, findings of previous research, and reliable scales taken from scientific resources. The Likert scale, ranging from 1 to 5, was used to measure how much agreement the participants had towards each item on the survey, with 1 being "strongly disagree" and 5 representing "strongly agree."

The process involved establishing the validity and reliability of the survey tool, especially through the use of the test-retest technique to determine the reliability of the scale, obtaining a Cronbach's Alpha Coefficient of 0.89. The questionnaire's validity was evaluated in terms of its face and content validity. For this purpose, it was provided to eight professors specialized in management information systems, strategic management, and measurement and evaluation.

Research Population and Sample

The research population consisted of managers and employees at the middle and upper management levels in Iraqi government, mixed, and private economic organizations in Qadisiyah Governorate and neighboring governorates. A purposive sample was applied to ensure the selection of individuals with direct experience in dealing with management information systems and digital operations. The actual sample size was 55 participants.

Table 1. Distribution of Research Sample Members by Demographic Variables.

Variable	Category	Number	Percentage %
Gender	Male	27	49.1%
	Female	28	50.9%
Age Group	Under 30 years	10	18.2%
	30-45 years	24	43.6%
	Over 45 years	21	38.2%
Educational Qualification	Bachelor's	15	27.3%
	Master's	30	54.5%
	Doctorate	10	18.2%
Years of Experience	Less than 5 years	7	12.7%
	5-15 years	23	41.8%
	Over 15 years	25	45.5%

Statistical Methods Used

Several statistical approaches were used in analyzing the collected data through SPSS v.26, including the following:

1- Frequencies and percentages: To describe the socio-demographic information of the research participants.

2- Means and standard deviations: To describe the degree of responding to the questions among the research sample members.

3-One-Sample T-Test: To test the hypothesis by comparing the mean of the research item with the hypothetical one (3.00) on the five-point Likert scale.

4-Simple Linear Regression Analysis: To estimate the magnitude of the impact of the independent variables on the dependent one.

5-Pearson's correlation coefficient: To assess the degree and direction of the correlation among the study variables.

6-Cronbach's alpha coefficient: To assess the internal reliability of the study tool.

3. Presentation and Analysis of Results

Testing the Main Hypothesis

To test the main hypothesis stating that there are no statistically significant differences between the arithmetic mean and the hypothesized mean in the level of the impact of digital transformation using management information systems on institutional performance efficiency, a one-sample t-test was applied, and the study reached the following results:

Table 2. Results of the T-test for the main hypothesis.

Variable	Arithmetic mean	Standard deviation	Calculated T value	Significance level	Decision
Digital transformation and management information systems	3.91	0.67	10.41	0.000	Reject the null hypothesis
Institutional performance efficiency	3.89	0.71	9.87	0.000	Reject the null hypothesis

Table (2) shows that the calculated T-value was 10.41 at a significance level of 0.000, which is lower than the accepted significance level of 0.05, which means that the null hypothesis is

rejected and the alternative hypothesis is accepted, stating that there is a statistically significant effect of digital transformation through management information systems on institutional performance efficiency. Since the arithmetic mean (3.91) is higher than the hypothesized mean (3.00), the effect is positive and has high practical significance.

Results of the Sub-hypothesis Tests

Table 3. Results of the Sub-hypothesis Tests.

Sub-Hypothesis	Arithmetic Mean	Standard Deviation	T-value	Significance Level	
Impact of Decision Support Systems on Performance Efficiency	3.94	0.73	9.23	0.000	Ho Reject
Impact of Electronic Processing Systems on Operational Efficiency	3.85	0.69	8.64	0.001	Ho Reject
The Role of Strategic Information Systems in Competitive Advantage	3.96	0.65	9.97	0.000	Ho Reject

Table (3) reveals that all null hypotheses were rejected in favor of the alternative hypotheses, confirming the positive and statistically significant impact of all dimensions of management information systems on indicators of organizational performance efficiency at confidence levels exceeding 99%.

Results of the Questionnaire Factor Analysis

Table 4. Results of the Factor Analysis of the Questionnaire's Main Factors.

Axis	Arithmetic Mean	Standard Deviation	Impact Level
Strategic Information Systems and Competitive Advantage	3.96	0.65	Very High
Decision Support Systems and Quality of Managerial Decisions	3.94	0.73	High
Level of Integration of Management Information Systems	3.91	0.67	High
Electronic Processing	3.85	0.69	High

Systems and Operational Efficiency			
Barriers to Digital Transformation and Implementation Challenges	4.11	0.59	Very High

As per Table 4, the strategic information system dimension scored the highest mean score (3.96). This is due to the fact that the respondents are aware of the importance of such systems. The second dimension that scored the highest mean score was digital transformation barriers (4.11), which denotes the level of awareness among the organization's leadership.

Results of the Linear Regression Analysis

Table 5. Results of the Simple Linear Regression Analysis.

Relationship	**F-value**	**Significance Level**	**Beta**	**R^2**
Digital Transformation - Institutional Performance Efficiency	112.4	0.000	0.82	0.68
Decision Support Systems - Quality of Decisions	84.7	0.000	0.78	0.61
Information Systems Integration - Operational Efficiency	72.3	0.000	0.75	0.57

As shown in Table 5, the variance in organizational performance efficiency explained by digital transformation via management information systems is 68% ($R^2 = 0.68$), while the beta value of 0.82 represents a positive, strong, and very significant impact.

4. Conclusions, Recommendations, and Proposals

Conclusions

Considering the results of the statistical analysis and the interpretation of its results in the theoretical framework, the main conclusions can be made about the following results of the study:

1- There is a high degree of confidence that digital transformation using management information systems positively affects the efficiency of organizational performance, as shown by the results of the t-test conducted with high statistical significance.

2- Strategic information systems have the highest impact among all other dimensions (with the mean of 3.96), which confirms the strategic importance of these systems in achieving competitive advantage and making decisions.

3- Digital transformation via management information systems can explain 68% of the variance in organizational performance efficiency based on the linear regression model, highlighting the importance of this variable.

4- There was a clear discrepancy between the understanding of the significance of digital transformation and its actual implementation as a planned process; this discrepancy can be explained by the presence of various factors.

5- According to the research, the main problem that hinders digital transformation in Iraqi

companies is a lack of specialists with particular competence in management information systems, with inadequate digital infrastructure and absence of a comprehensive approach being the other significant factors hindering the process.

6- This study proved that there was a statistical difference in organizational performance in favor of organizations with high degrees of integration in their management information systems.

Recommendations

On the basis of the above conclusions, this research paper proposes the following recommendations:

1- There is a necessity to develop comprehensive digital transformation plans that outline a clear vision, establish quantitative objectives, and identify a timetable for building up management information systems and integrating them with organizational strategic objectives.

2- The importance of investing in developing human capital proficient in management information systems by means of consistent training programs and linking their career tracks with possessing certified digital competencies.

3- Encouraging organizations to opt for integrated ERP systems that integrate data generated by all organizational departments within one unified system, thus preventing data isolation and improving the quality of organizational decision-making.

4- Formulating data management principles that lay down criteria for quality, security, privacy, and data integration, which serve as an essential base for digital transformation through management information systems.

5- Promoting a culture of digital transformation via awareness programs and consistent change efforts aimed at all organizational levels, along with leading the process through exemplary leadership behavior.

6- Calling upon concerned governmental authorities to establish clear policies and regulatory frameworks that encourage organizations to embark on digital transformation and create a legislative framework for investment in management information systems.

Recommendations

1- Undertake an analysis study in comparing the status of the digital transformation process via management information systems in public and private organizations in Iraq, analyzing the differences between both types of organizations and what causes such differences.

2- Establish a benchmark model regarding the maturity level of management information systems within Iraqi organizations, which will serve in institutional evaluations and benchmarking purposes.

3- Undertake a longitudinal study investigating the change in the effect of digital transformation on institutional performance over time (over 3 to 5 years).

4- To investigate the feasibility of utilizing artificial intelligence and machine learning technologies within the context of the management information systems concept, and their additional impact on organizational performance.

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