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Digital transformation and crisis management: Evidence from Al-Iman governmental hospital at Ajloun Governoratex

Abeer Al-Momani[1*], Sawsan A. Alshaer[2]

[1]*Jadara University, Jordan.*
[2]*The World Islamic Sciences & Education University, Jordan.*

Corresponding author: Abeer Al-Momani (*Email: abnamoo@yahoo.com*)

Abstract

The study aims to identify the effect of digital transformation on crisis management and study the overall level of digital transformation implementation at Al-Iman Governmental Hospital in Ajloun Governorate. Its relied on a descriptive-analytical approach, and data were collected through a questionnaire distributed to the sample of 248 employees. The results showed that the level of digital transformation implementation at Al-Iman Governmental Hospital was generally moderate. Its recommended strengthening the adoption of digital transformation at Al-Iman Governmental Hospital.

Keywords: Al-Iman governmental hospital, Crisis management, Digital capabilities, Digital culture, Digital infrastructure, Digital Leadership, Digital strategy, Digital transformation.

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1. Introduction

The Arab world is witnessing a rapid digital transformation, which has become essential for the survival of organizations and for achieving a competitive advantage in the business environment. This is accomplished through the adoption and application of digital technologies across most fields, to improve efficiency and foster innovation [1].

A crisis refers to unexpected and unplanned events that have the potential to cause significant damage and cannot be managed using routine methods. Crisis management focuses on maintaining control over events, limiting their escalation, containing them, and mitigating their severity through a series of actions and decisions [2].

The problem lies in crisis management at Al-Iman Governmental Hospital, like other organizations, it is continuously exposed to potential crises, amid ongoing environmental changes, driven by rapid technological developments, and other factors. These challenges affect the hospital's ability to innovate and provide advanced services that meet the needs of

beneficiaries, as well as its capacity to respond to change. This necessitates a reconsideration of its business strategy to effectively manage a crisis, through detecting warning signals, preparedness and prevention, damage containment, recovery, and organizational learning.

It's therefore motivated by a central research problem: To what extent does digital transformation impact crisis management at Al-Iman Governmental Hospital in Ajloun Governorate?

This study aims to develop a comprehensive analytical understanding of the relationship between digital transformation and crisis management at Al-Iman Governmental Hospital. Specifically, it seeks to achieve the following objectives:

- To identify the relative importance of digital transformation and its dimensions (Digital Strategy, Digital Leadership, Digital Culture, digital capabilities, and digital infrastructure) at Al-Iman Governmental Hospital.
- To identify the relative importance of crisis management and its dimensions (detecting warning signals, preparedness and prevention, damage containment, recovery, and learning) at Al-Iman Governmental Hospital.
- To identify the impact of digital transformation, with its dimensions (Digital Strategy, Digital Leadership, Digital Culture, digital capabilities, and digital infrastructure), on the crisis management, with its dimensions (detecting warning signals, preparedness and prevention, damage containment, recovery, and learning) at Al-Iman Governmental Hospital.

2. Study Importance

The importance of the study stems from the following:

2.1. Academic and Practical Importance

The academic importance of the study lies in its examination of the variables represented by digital transformation and its dimensions (digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure) and crisis management and its dimensions (early warning signal detection, preparedness and prevention, damage containment, recovery, and learning). Digital transformation has been widely studied as a motor of organizational change and innovation. It involves adopting digital technologies that reshape work processes. Crisis have become a fundamental characteristic of contemporary organizations due to the significant change, and increasing complexity of the surrounding business environment, crisis management is considered one of the concepts that embodies managerial philosophies, reflecting an organization's continuous readiness to face crisis through developing operational capabilities, setting plans, and training individuals to deal with these crisis by following a set of proactive procedures to improve its operations, Its academic importance is also reflected in enriching and expanding scientific knowledge regarding (digital transformation and crisis management). It also demonstrates its Academic importance by enriching and expanding knowledge on digital transformation and crisis management. This makes it a scientific contribution that helps bridge the research gap in these areas and adds to the accumulated body of knowledge in the academic literature. It is considered one of the few studies that may contribute to guiding future research and serve as a starting point for further studies in this field.

2.2. Practical Relevance

The practical importance of the study lies in the results it will reach and the recommendations it will provide, which will guide decision-makers toward enhancing their ability to compete and adapt to rapid environmental changes, in light of the accelerating digital transformation at Al-Iman Governmental Hospital. It also demonstrates its applied importance in the significance of the sector, in which it will be implemented, namely at Al-Iman Governmental Hospital. The hospital considered influential institutions that are witnessing remarkable development, due to their vital role in providing therapeutic and preventive services, training and continuous education, offering support services for medical care, and attracting medical tourism to the country.

3. Literature Review and Conceptual Framework

A thorough review of existing literature provides a critical foundation for this study, which investigates the relationship between digital transformation and crisis management in the context of Al-Iman Governmental Hospital. This section synthesizes key theoretical concepts, strategic models, and empirical findings from global and regional scholarship to develop a comprehensive conceptual framework

3.1. Digital Transformation

Digital transformation represents a fundamental change, rather than a superficial one. Continued reliance on traditional practices, without development, may expose organizations to crisis [3]. Digital transformation can also be understood as a digital system, based on information technology, involving a shift from a traditional system to a digital one [4].

3.2. Digital Transformation Dimensions

Several researchers in management science indicate that digital transformation has multiple dimensions, with variations among scholars in defining these dimensions. Al-Kilani and Fathi [4] measured digital transformation through (digital strategy, human skills, technologies, and digital control). Al-Ramidi, et al. [5] examined the dimensions of (processes, dissemination of digital transformation culture, IT infrastructure, innovation, and employees' digital capabilities). Al-Mutrif [6] addressed the dimensions of (physical elements, human elements, technological infrastructure,

and digital competencies). Hiziroglu, et al. [7] examined the dimensions of (digital infrastructure, digital skills, digital channels, and organizational flexibility). Based on previous studies, this study will measure digital transformation through the following dimensions: digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure.

3.2.1. Digital Strategy

Digital transformation is more closely related to strategy than to technology itself. Organizations must pay close attention to developing a strong and well-designed strategy to achieve higher employee efficiency. The absence of a digital transformation strategy is considered the primary obstacle on the path toward becoming a successful digital organization. Strategy serves as a bridge between business and information technology, helping integrate technologies into organizational processes, which reflects the growing emphasis on service quality [8].

3.2.2. Digital Leadership

Digital leadership does not merely refer to managing business in the age of artificial intelligence; it also involves possessing the appropriate digital skills to drive technological change and innovation. It is based on several factors, such as organizational flexibility, engagement of skilled employees, leadership and support from technology partners, investment, organizational culture, alignment of new digital technologies with existing IT systems, and the ability to manage failed projects. This type of leadership also requires core leadership capabilities to enhance both internal and external collaboration to co-create ideas and strategies for digital transformation. Digital leadership can be considered a strategic factor that influences the well-being of internal human resources [9].

3.2.3. Digital Culture

Digital culture stems from the existence of digital technology and is shaped by it. The presence of an evolving digital culture can only be understood in light of modern technological developments, as it appears fundamentally different from what preceded it. However, digital culture is not as new as it may seem, and its development is not ultimately determined solely by technological advancement. Rather, it is more accurate to say that digital technology itself is a product of digital culture [10].

3.2.4. Digital Capabilities

Digital capabilities are considered dynamic capabilities that enable organizations to integrate digital assets with business resources and innovate new services through digital networks, thereby ensuring value creation for customers and achieving a competitive advantage. Digital capabilities are also associated with the extent of effective utilization of digital technologies within organizations, and the ability to align information technology operations with the digital transformation strategy [11]..

3.2.5. Digital Infrastructure

Digital infrastructure involves providing everything required for the digital transformation process, including hardware, communication networks, electronic networks that connect organizations, software, and databases [12]. It also refers to a set of technological equipment and resources, including communication devices, the internet, and various applications [5].

3.3. Crisis Management

Crisis management refers to the methods and procedures developed by human resource management, with the aim of anticipating crises, preparing for them, reducing their impacts, and leveraging the organization's experience and capabilities. This enables the organization to build an "immune system" that protects it from crisis [13]. It is defined as a scientific technique that follows a systematic approach, enabling the organization to confront a crisis while benefiting from its positive aspects [14].

3.3.1. Crisis Management Dimensions

Researchers have not reached a consensus on the same dimensions of crisis management, as there is variation among scholars in defining these dimensions. Al-Kilani and Fathi [4] measured crisis management through (early warning signal detection, preparedness, damage containment, recovery, and learning). Meanwhile, Vladu [15] addressed the dimensions of crisis management as (preparedness, response, recovery, and learning). Based on previous studies, crisis management in this research will be measured through the following dimensions: early warning signals, preparedness and prevention, damage containment, recovery, and learning.

3.3.1.1. Early Warning Signals

This stage is characterized by the fact that a crisis, before its occurrence, sends a series of early warning signals, indicating the possibility of its emergence. If these signals are not properly recognized and understood, the crisis is likely to occur. It is recommended that managers in organizations, prepared to confront a crisis, possess a high level of skill in sensing warning signals, as each crisis sends its own specific indicators [16].

3.3.1.2. Preparedness and Prevention

The preparedness and prevention stage, refers to the prior preparations, made to confront a potential crisis, with the aim of reducing its impacts. Organizations must have adequate methods, and readiness, measures to prevent crisis, through operational procedures, and management structures, in order to identify any possible symptoms of anticipated crisis [17].

3.3.1.3. Damage Containment

In the crisis containment stage (confrontation phase), methods and approaches are identified to limit damages and prevent their escalation throughout the organization. The success of an organization in this stage depends on its level of preparedness to respond to the crisis, the type of crisis, and the effectiveness and efficiency of the command and control center, as well as the degree of cooperation and coordination among the relevant units [18].

3.3.1.4. Recovery

In the recovery stage, the organization returns to its normal state after the crisis has ended, and damages have been contained. Crisis managers can restore normal operations and implement programs and policies that make affected organizations less vulnerable to future emergencies [19].

3.3.1.5. Learning

The learning stage, also known as the utilization of the crisis, is an important phase that takes place after the crisis has ended. Crisis management focuses on benefiting from lessons learned, insights, and experiences, as well as developing information and communication systems. It also involves training and developing work teams to equip them with the necessary skills in preparation for future crises, to avoid repeating the same mistakes, and to ensure that the organization does not experience the same crisis again [14].

3.4. Empirical Evidence on the Digital Transformation and Crisis Management Relationship

Numerous studies affirm the positive impact of digital transformation on crisis management.

study by Al-Kilani and Fathi [4] titled: Digital Transformation and Its Role in the Stages of Crisis Management: An Exploratory Study of the Opinions of a Sample of Managers in the General Company for Electricity Distribution, in the Northern Region of Iraq. The sample contains (255) managers. The study found a positive and statistically significant correlation between digital transformation and the stages of crisis management at the overall level in the company studied. The study recommended the development of a comprehensive emergency management plan.

Study by Cardoso, et al. [20] titled: From Crisis to Opportunity: Digital Transformation, Digital Business Models, and Organizational Resilience in the Post-Pandemic Era in Portugal. The study sample consisted of 320 managers. The findings revealed that digital transformation is closely associated with innovation and strategic adaptation. The study recommended adopting an integrated approach to digital transformation, along with strategies aimed at building organizational resilience, in order to effectively manage a crisis.

Study by Vladu [15] titled: Digital Transformation in Crisis Management: The Key Role of Artificial Intelligence in Romania. The study included a review of relevant literature and an analysis of previous studies. The findings revealed that digital transformation has fundamentally changed the way crises are managed. The study recommended the adoption of digital transformation and artificial intelligence technologies in international conflict management due to their ability to identify threats. Study by Hiziroglu, et al. [7] titled: The Role of Digital Transformation for SMEs During a Health Crisis: Lessons Learned from the COVID-19 Epidemic in Turkey. sample consisting of (50) SMEs. The findings revealed a strong association between the comprehensive concept of digital transformation and the performance of SMEs during the COVID-19 pandemic. The study recommended the importance of preparing for potential future crises and ensuring the continuous engagement of SMEs in digital transformation. Study by Al-Mutrif [6] titled:

Digital Transformation of University Education in Times of Crisis: A Comparison between Public and Private Universities from the Perspective of Faculty Members in Saudi Arabia. The sample consisted of 200 faculty members. The study found statistically significant differences at the significance level between public and private universities. The study recommended the necessity of providing both technological and physical resources and qualified human resources capable of effectively utilizing technological infrastructure.

Based on the above, the researcher puts forward the following hypothesis:

Ho1: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital transformation, with its dimensions (digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure), on crisis management in its combined dimensions (early warning signal detection, preparedness and prevention, damage containment, recovery, and learning) at Al-Iman Governmental Hospital.

Ho1-1: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital strategy on crisis management at Al-Iman Governmental Hospital.

Ho1-2: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital leadership on crisis management at Al-Iman Governmental Hospital.

Ho1-3: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital culture on crisis management at Al-Iman Governmental Hospital.

Ho1-4: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital capabilities on crisis management at Al-Iman Governmental Hospital.

Ho1-5: There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of digital infrastructure on crisis management at Al-Iman Governmental Hospital.

3.5. Research Gap

Although the discourse on digital transformation has gained momentum globally and increasingly within the context of the health field, empirical research explicitly focused on Al-Iman Governmental Hospital remains limited, fragmented, and under-theorized. Most existing studies either concentrate on large enterprises or examine the digital shift through a narrow technological lens, overlooking the strategic, cultural, and organizational complexities.

In particular, there is a lack of studies that explain how digital transformation influences crisis management. Most available work does not distinguish whether digital transformation in this hospital is from proactive planning or reactive adaptation to investor or market pressures. Moreover, local studies in the health context tend to underutilize theoretical frameworks and rarely adopt holistic approaches that integrate both qualitative and quantitative evidence. Thus, a theory-informed, context-sensitive, and empirically grounded investigation is needed to fill this gap, one that captures the nuanced reality of Al-Iman Governmental Hospital and provides actionable insights into how digital transformation can be strategically enhanced in crisis management, under local constraints and opportunities.

4. Method

4.1. Research Design and Philosophical Approach

This study adopts a descriptive-analytical methodology to address the multidimensional nature of the research questions, particularly the relationship between digital transformation and crisis management at Al-Iman Governmental Hospital. Rather than relying solely on quantitative metrics or anecdotal insights, this approach seeks to interpret the structural and strategic dynamics underlying digital transformation and crisis management. The chosen methodology reflects the study's commitment to bridging the gap between theory and practice. It avoids simplistic correlations and captures the nuanced, contextual influence of digital transformation in the startup environment.

4.2. Analytical Model and Conceptual Structure

The analytical framework is adapted and modified to suit entrepreneurial contexts. The framework integrates: Independent Variable: Digital Transformation, Dependent Variable: Crisis Management. Each construct was operationalized into measurable indicators and converted into survey items using a five-point Likert scale. Open-ended questions were also included to allow for qualitative reflection and context-specific interpretation.

4.3. Data Collection Instruments

A composite questionnaire was developed, consisting of:

- Closed-ended items grouped into ten dimensions: digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure, detecting warning signals, preparedness and prevention, damage containment, recovery, and learning.
- Demographic and organizational background questions.
- Open-ended prompts designed to capture nuanced perceptions, success factors, and obstacles.

Additionally, semi-structured interviews will be conducted with a purposive sample of founders, executives, and digital officers at Al-Iman Governmental Hospital. These interviews enrich the interpretation of quantitative findings with firsthand perspectives.

4.4. Study Population

The study population consists of all employees working at Al-Iman Government Hospital, with a total of 700 employees. The researcher adopts a simple random sampling method. A sample will be drawn from the employees numbering 700, and the study sample size will consist of 248 employees. The Statistical Package for Social Sciences (SPSS) is used to conduct various statistical analyses and tests. Descriptive statistical analysis is used for the purpose of describing the characteristics of the sample participants and summarizing their responses.

Validity and reliability testing are considered essential steps in quantitative studies, as they aim to ensure that the study instrument accurately and reliably measures the intended concepts. Reliability refers to the degree of internal consistency among the scale items, meaning the extent to which respondents' answers are consistent across items measuring the same dimension. One of the most commonly used methods for measuring reliability is Cronbach’s Alpha coefficient.

4.5. Research Scope and Methodological Limitations

This study is geographically confined to startups operating at Al-Iman Governmental Hospital in Ajloun Governorate, offering context-rich insights into the governmental digital transformation landscape. The temporal scope spans 2026–2027, a period marked by accelerated government investment in digital infrastructure and entrepreneurship. While the findings are locally relevant, caution is advised when extrapolating to regions with different technological or regulatory ecosystems. The analysis is limited to startups actively engaged in digital transformation; traditional firms were excluded to maintain a focused investigation on strategic digital deployment. Data collection relied on validated, self-administered questionnaires, which may be subject to perceptual or social desirability biases. This study is considered applied in nature, explanatory in purpose, non-contrived in terms of planning and control, and cross-sectional in terms of time horizon. A proportionate stratified random sample representing the study population will be selected.

4.6. Ethical Consideration

This research was conducted in full compliance with established academic ethics guidelines and institutional protocols. Prior approval was obtained from the Research Ethics Committee at our university, which reviewed the study's objectives, methodology, and data collection instruments. All participants received an informed consent form that clearly outlined the research purpose, their right to voluntary participation, their right to withdraw at any time without penalty, and the exclusive use of data for this academic research only. No personally identifiable or sensitive information was collected. All responses were anonymized, encrypted, and securely stored in accordance with data protection standards. The researcher maintained neutrality and objectivity throughout the process, ensuring that no undue influence was exerted on the participants.The study fully adheres to ethical norms governing research involving human participants, including transparency, confidentiality, and respect for participant autonomy.

4.7. Operationalization of the Conceptual Framework

To empirically examine the conceptual relationships outlined in this study, an operational framework was developed to translate theoretical constructs into measurable variables. It has been customized to reflect the context of digital transformation within Al-Iman Governmental Hospital. The study's key variables were categorized as follows:

- Independent Variable: Digital Transformation, measured through five dimensions: digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure
- Dependent variable: Crisis Management captured across five domains: detecting warning signals, preparedness and prevention, damage containment, recovery, and learning.

Each construct was operationalized using a structured questionnaire, based on a five-point Likert scale. The survey items were directly mapped to the conceptual dimensions to ensure content validity and facilitate hypothesis testing. Structural Equation Modeling (SEM) was employed, to statistically assess the relationships between constructs, uncover mediating pathways, and validate the theoretical framework. This operational framework serves as the empirical backbone of the study, ensuring methodological coherence between theory, measurement, and analysis.

4.8. Enhancing Theoretical Integration in Light of the Al-Iman Governmental Hospital Context

Digital leadership and digital culture contribute positively to improving the various stages of crisis management. The results indicated that digital transformation contributes to enhancing the detection of early warning signals of crisis, digital leadership contributes significantly to supporting digital transformation, and enhances the hospital's ability to manage crisis. The study findings validate the applicability of the Al-Iman Governmental Hospital in explaining how digital leadership and digital culture contribute positively to improving the various stages of crisis management. This is reflected in digital leadership, which contributes significantly to supporting digital transformation and enhancing the hospital's ability to manage crises. Moreover, the study suggests that digital transformation helps restore operations more quickly after a crisis, supports organizational learning from previous crises, and improves future planning. These findings further support the assumptions of Digital Transformation Theory, as the data revealed that digital technologies demonstrate at Al-Iman Governmental Hospital a greater capacity to cope with challenges and enhance operational efficiency.

4.9. Distinguished Contribution of the Study

This study offers a distinctive contribution to the field of management, particularly within the context of the health sector. It is among the first to develop a comprehensive analytical framework that captures the interplay between variables in Al-Iman Governmental Hospital. The contribution of the study can be summarized along the following dimensions:

Contextual focus on Al-Iman Governmental Hospital:

The research foregrounds the specific institutional and cultural characteristics of Al-Iman Governmental Hospital.

Strategic Reframing of Management:

By conceptualizing management as a strategic motor of innovation and long-term sustainability, the study contributes to an evolving paradigm that digitalization, with management and entrepreneurial growth, and competitiveness in the hospital.

Bridging a regional research gap:

As one of the few empirical investigations into digital transformation and crisis management at Al-Iman Governmental Hospital, this research establishes a foundational reference for future academic work and policymaking.

Inclusion of underexplored dimensions:

The study introduces contextual variables such as founder demographics (e.g., age, experience) and the moderating influence of technological infrastructure, and cultural transformation factors typically overlooked in the mainstream of management.

5. Analysis and Discussion

In the following sections, we present the theoretical framework and conceptual model, which is based on analyzing the data collected from the study sample. The aim is to process both quantitative and qualitative data, using statistical methods, and analytical techniques, to test the proposed hypotheses, and understand the relationships between the independent variables (digital transformation: digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure) and the dependent variable (crisis management: early warning signal detection, preparedness and prevention, damage containment, recovery, and learning). We begin by presenting the descriptive results, which highlight the characteristics of the sample and the levels of the study variables.

5.1. Demographic Characteristics of the Study Sample

- Sample Description (Descriptive Statistics)

Table 1.
Distribution of the Study Sample According to Demographic Variables.

Variable	Category	Frequency	Percentage (%)
Gender	Female	158	63.7
	Male	90	36.3
Age	Less than 30 years	86	34.7
	30 – Less than 40 years	88	35.5
	40 – Less than 50 years	56	22.6
	50 years and above	18	7.3
Qualification	Bachelor's Degree	162	65.3
	Diploma	32	12.9
	Master's Degree	44	17.7
	Doctorate	10	4.0
Experience	Less than 10 years	138	55.6
	10 – Less than 15 years	34	13.7
	15 – Less than 20 years	24	9.7
	20 years or more	52	21.0
Total	—	248	100

The demographic data of the participants (N=248) were analyzed as follows:
Individual Characteristics:
Gender: 63.7% male, 36.3% female
Age: The predominant age group was 30-40 years (35.5%)
Educational Level: 21.7% held postgraduate degrees
Experiences: 21% have 20 years or more

Table 1 presents the distribution of the study sample according to the demographic variables. Regarding gender, the majority of participants were females, representing 63.7% (158 respondents), compared to 36.3% males (90 respondents), indicating a higher representation of females in the sample.

In terms of age, the most represented group was 30–less than 40 years, accounting for 35.5% (88 respondents), followed closely by the group less than 30 years at 34.7% (86 respondents). The 40–less than 50 years group represented 22.6% (56 respondents), while those aged 50 years and above constituted 7.3% (18 respondents), reflecting a concentration of the sample within younger and middle-aged categories.

Regarding educational level, the majority held a bachelor's degree at 65.3% (162 respondents), followed by master's degree holders at 17.7% (44 respondents), diploma holders at 12.9% (32 respondents), and doctorate holders at 4% (10 respondents). This indicates that most participants have a university-level education.

As for work experience, the largest group had less than 10 years of experience at 55.6% (138 respondents), followed by those with 20 years or more at 21% (52 respondents), then 10–less than 15 years at 13.7% (34 respondents), and finally 15–less than 20 years at 9.7% (24 respondents). This suggests that the majority of respondents have relatively limited professional experience.

Overall, the sample is predominantly composed of young to middle-aged female participants, mostly holding bachelor's degrees, and having less than 10 years of experience. This provides a suitable basis for examining their perceptions and responses toward the study variables.

- *Internal Consistency Analysis (Cronbach's Alpha)*

5.2. Validity and Reliability of the Study Instrument

The assessment of validity and reliability is considered one of the fundamental steps in quantitative research. Reliability refers to the degree of internal consistency of the scale items, meaning the extent to which respondents' answers to items, measuring the same dimension, are homogeneous. One of the most commonly used methods for measuring reliability is Cronbach's Alpha coefficient.

Table 2.
Results of the Reliability Test Using Cronbach's Alpha for Study Variables.

Items	Cronbach Alpha	Variable
4	0.888	Digital strategy
4	0.863	Digital leadership
4	0.843	Digital culture
3	0.798	Digital capability
4	0.839	Digital infrastructure
15	0.938	In digital transformation
4	0.888	Early warning signal detection
4	0.875	Preparedness and prevention
4	0.887	Damage containment
4	0.857	Recovery
4	0.877	Learning
20	0.966	In crisis management
35	0.962	Total

The reliability of the questionnaire constructs was assessed using Cronbach's alpha coefficients, with the following results:
Digital Strategy: 0.888
Digital Leadership: 0.863
Digital Culture: 0.843
Digital Capability: 0.798
Digital Infrastructure: 0.839
Digital Transformation: 0.938
Early Warning Signal Detection: 0.888
Preparedness and Prevention: 0.875
Damage Containment: 0.887
Recovery: 0.857
Learning: 0.877
Crisis Management: 0.966

5.3. Reliability Results and Inferential Statistical Methods

The results presented in Table 2 indicate that Cronbach's Alpha coefficients for all study variables were high, ranging between (0.798) and (0.966), which are above the acceptable statistical threshold of (0.70). This indicates that the study instrument has a high level of reliability, and internal consistency. Furthermore, the digital transformation and crisis management variables recorded high reliability values of (0.938) and (0.966), respectively, while the overall reliability coefficient of the instrument reached (0.962), which enhances the reliability of the instrument and supports the validity of its use in statistical analysis

- Descriptive Analysis of Variables

5.4. Digital Transformation and Its Dimensions

The relative importance of digital transformation and its dimensions (digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure) at Al-Iman Governmental Hospital

Table 3.
Levels of Relative Importance.

Measure (Mean)	Level of Relative Importance
Less than 2.34	Low
2.34 to less than 3.67	Medium
3.67 to 5	High

Table 4.
Means, Standard Deviations, and Relative Importance of the Dimensions of Digital Transformation.

No.	Item	Mean	St.dev.	Importance	Relative Importance
1	Digital Strategy	3.36	0.87	Moderate	67.2
2	lDigital Leadership	3.46	0.79	Moderate	69.2
3	lDigital Culture	3.59	0.87	Moderate	67.2
4	Digital Capability	3.53	0.78	Moderate	70.6

5	Digital Infrastructure	3.69	0.80	Moderate	73.8
	Digital Transfusion Total	3.53	0.70	Moderate	70.6

5.5. Digital Transformation and Its Dimensions

The results presented in Table 4 show that the level of digital strategy was moderate, with an overall mean score of (3.36) and a relative importance of (67.2). The item related to setting priorities and objectives for digital transformation, based on employees' needs, recorded the highest mean score (3.43) while the item related to the availability of a dedicated budget for digital projects ranked last with a mean score of (3.23). This indicates a relative weakness in financial support compared to planning aspects. Digital leadership also came at a moderate level, with a mean score of (3.46) and a relative importance of (69.2). The item related to top management support for digital transformation achieved the highest mean score (3.60) whereas the item concerning motivating employees, to adopt digital tools recorded the lowest mean score (3.31). This suggests that managerial support is relatively available, while employee motivation still requires further enhancement.

5.6. Crisis Management and Its Dimensions

The relative importance of crisis management and its dimensions (early warning signals, preparedness and prevention, damage containment, recovery, and learning) at Al-Iman Governmental Hospital, which examines the relative importance of crisis management, and its dimensions at Al-Iman Governmental Hospital, the arithmetic means, standard deviations, and relative importance levels of the items, measuring crisis management, and its dimensions were calculated.

Table 5.
Means, Standard Deviations, and Relative Importance of the Dimensions of Crisis Management.

No.	Item	Mean	St.dev	Importance	Relative importance
1	Early warning signal detection	3.49	0.87	Moderate	69.8
2	Preparedness and prevention	3.51	0.82	Moderate	70.2
3	Damage containment	3.52	0.79	Moderate	70.4
4	Recovery	3.54	0.79	Moderate	70.8
5	Learning	3.56	0.79	Moderate	71.2
	Crisis Management Total	3.52	0.74	Moderate	70.4

Table 5 presents the evaluation of crisis management dimensions at Al-Iman Governmental Hospital from the participants' perspective. Regarding the early warning signals dimension, it obtained a mean score of (3.49) with a standard deviation of (0.87), reflecting a moderate level of importance. The highest-rated item was: "The hospital has a specialized department responsible for monitoring crisis indicators," with a mean of (3.64). The lowest-rated item was: "The hospital management collects and analyzes crisis indicators through a qualified team," with a mean of (3.29). As for the preparedness and prevention dimension, it recorded a mean of (3.51) with a standard deviation of (0.82). The highest-rated item was: "Adequate crisis management plans are available and continuously developed," with a mean of (3.52) while the lowest-rated item was: "Simulation exercises are conducted to deal with potential crisis," with a mean of (3.48). Regarding the damage containment dimension, it achieved a mean score of (3.52) with a standard deviation of (0.79). The highest-rated item was: "Emergency procedures are effectively used to limit the damages caused by crises," with a mean of (3.61). The lowest-rated item was: "There is a timely mobilization of the necessary human and material resources to contain the crisis," with a mean of (3.46).

5.7. Testing the Assumptions of Regression Analysis

5.7.1. Multicollinearity

Multicollinearity testing is considered one of the essential preliminary procedures before conducting multiple regression analysis. It aims to ensure that there are no high correlations among the independent variables, which may negatively affect the accuracy of estimating regression coefficients and the stability of the model. This issue is commonly assessed using both the Variance Inflation Factor (VIF) and the Tolerance value. Multicollinearity is considered problematic when the VIF value exceeds the acceptable threshold of (10), or when the Tolerance value falls below (0.05) [21].

Table 6.
Results of the Multicollinearity Test (VIF) and Tolerance for the Independent Variables of the Study.

	Tolerance	VIF
Digital Strategy	0.288	3.077
Digital Leadership	0.398	2.512
Digital Culture	0.306	2.971
Digital Capability	0.385	2.599
Digital Infrastructure	0.447	2.238

The results presented in Table 6 show that the Variance Inflation Factor (VIF) values for all independent variables range between (2.238) and (3.077), which are below the critical threshold of (10). In addition, the Tolerance values ranged between (0.288) and (0.447), which are above the acceptable minimum value of (0.05).

These results indicate that there is no multicollinearity problem among the digital transformation variables, suggesting a sufficient level of independence among the independent variables.

5.7.2. Normal Distribution

The normality of data was assessed using Skewness and Kurtosis values for all items of the study variables. The results indicated that the Skewness values ranged between -0.586 and 0.192, while the Kurtosis values ranged between -0.909 and 0.771. All values fall within the acceptable range of ±2, indicating that the data distribution is approximately normal. These findings support the fundamental assumption required for conducting parametric statistical analyses, such as regression analysis and mean comparisons, as normality is considered an essential requirement for the validity of statistical results.

5.8. Testing the Study Hypotheses

The impact of digital transformation and its dimensions (digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure) on crisis management and its dimensions (early warning signals, preparedness and prevention, damage containment, recovery, and learning) at Al-Iman Governmental Hospital.

Multiple regression analysis was used to examine the effect of digital transformation dimensions, namely digital strategy, digital leadership, digital culture, digital capabilities, and digital infrastructure, on crisis management at Al-Iman Governmental Hospital. Crisis management was measured through its dimensions, which include: early warning signal detection, preparedness and prevention, damage containment, recovery, and learning.

Table 7.
Regression Model Summary for the Effect of Digital Transformation on Crisis Management.

Hypothesis	Variable	(B)	Std. Error	(Beta)	T	Sig. (p-value)
H01.1	Digital strategy	0.29	0.083	-0.107	-1.085	0.035
H01.2	Digital leadership	0.285	0.105	0.219	1.959	0.041
H01.3	Digital culture	0.25	0.093	0.154	1.615	0.04
H01.4	Digital cabapility	0.109	0.081	0.01	0.114	0.909
H01.5	Digital infrastructure	0.558	0.073	0.603	7.655	0.00

$$F = 48.455, Sig = 0.00\ , R = 0.82, R^2 = 0.672$$

Table 7 presents the results of the multiple regression analysis examining the effect of digital transformation dimensions, on crisis management at Al-Iman Governmental Hospital. The overall model showed a high level of statistical significance, with F = 48.455 and a significance level (p = 0.000). The correlation coefficient was R = 0.82, while the coefficient of determination was $R^2 = 0.672$, indicating that approximately 67.2% of the variance in crisis management can be explained by the five dimensions of digital transformation. At the individual level, the results revealed that digital infrastructure had the strongest positive and statistically significant effect (B = 0.558, Beta = 0.603, p = 0.000). This reflects its crucial role in enhancing the hospital's ability to detect early warning signals, ensure preparedness, contain damages, restore operations, and learn from crises. Similarly, digital leadership (B = 0.285, Beta = 0.219, p = 0.041) and digital culture (B = 0.250, Beta = 0.154, p = 0.040) showed a positive and statistically significant impact, indicating that supportive leadership and enabling digital culture contribute to improving crisis management practices. In contrast, digital strategy showed a weak but statistically significant negative relationship (B = 0.290, Beta = -0.107, p = 0.035), while digital capabilities did not show any statistically significant effect (B = 0.109, Beta = 0.010, p = 0.909), suggesting that the mere availability of capabilities is insufficient unless effectively integrated into digital processes. Overall, the findings highlight that investment in digital infrastructure, along with the development of digital leadership and culture, represents the core foundation for strengthening crisis management in the hospital.

6. Study Results

The study reached a set of key findings. It revealed that the overall level of digital transformation implementation at Al-Iman Governmental Hospital was moderate. The arithmetic means of the digital transformation dimensions ranged between moderate and high levels. The digital strategy dimension was rated at a moderate level, indicating a tendency toward adopting digital transformation, while highlighting the need for clearer strategic planning. The study also found a statistically significant effect of digital transformation in its combined dimensions on crisis management at Al-Iman Governmental Hospital. Digital transformation explained a significant proportion of the variance in crisis management, confirming its importance in enhancing the hospital's ability to deal with crises. Among the digital transformation dimensions, digital infrastructure was the most influential in crisis management, recording the highest statistically significant impact. This reflects its critical role in supporting rapid information exchange and decision-making processes. The findings also indicated that digital leadership and digital culture contribute positively to improving different stages of crisis management. Furthermore, digital transformation was found to enhance early warning signal detection, strengthen preparedness and prevention, contribute to damage containment and reduction of crisis impacts, and support organizational

learning from past crises. Overall, the results confirm that digital transformation plays a vital role in improving crisis management capabilities within the hospital.

7. Recommendations

Considering the findings, the researchers recommend strengthening the adoption of digital transformation at Al-Iman Governmental Hospital through the development of a clear and integrated digital strategy. Continuous improvement of the digital infrastructure is also essential to ensure rapid response during crises. Furthermore, the study recommends enhancing digital leadership by training administrative leaders on the use of modern technologies in crisis management and promoting digital culture among employees through workshops and awareness programs on the importance of digital transformation. It also emphasizes the need to develop digital capabilities among medical and administrative staff through specialized training programs. Its further recommends increasing investment in smart digital systems that support early warning signal detection for crises, establishing an integrated electronic crisis management system that connects all hospital departments, and strengthening the use of digital databases in decision-making during crises.

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