Digital transformation as a modern approach to improving the quality of health services: A case study of the Abdelrazak Bouhara Hospital in Skikda

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Abstract:

This study aimed to identify the role of digital transformation in improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda. A total of 50 questionnaires were distributed to a random sample. Based on the analysis of the collected data using SPSS, the results showed that digital transformation acts as a strategic driver for enhancing the quality of healthcare services. The statistical analysis also revealed a significant effect of the dimensions of digital transformation on improving healthcare service quality in the studied institution at a significance level of 0.05.

Keywords: Digital transformation, Quality of healthcare services, Digital leadership, Digital investment , hospital institution.

Jel Classification Codes: O33, I11.

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1. Introduction :

In light of the rapid technological advancements witnessed in today's world where the future is increasingly shaped by emerging concepts such as digital transformation the healthcare sector has become one of the most dynamic fields undergoing fundamental changes in service delivery methods. In this context, Abdelrazak Bouhara Hospital in Skikda was selected as a case study to examine the current state of digital transformation within a healthcare facility and to analyze its impact on the quality of healthcare services.

Research Problem:

Based on the previous introduction, the central question of this study revolves around the following: **To what extent does digital transformation contribute to improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda?**

From this main problem, a set of sub-questions arises:

- To what extent does digital dynamic capability affect the improvement of healthcare service quality at Abdelrazak Bouhara Hospital in Skikda?
- Is there a statistically significant impact of digital leadership capability on improving healthcare service quality at Abdelrazak Bouhara Hospital in Skikda?
- What is the nature of the relationship between employees' digital capability and the improvement of healthcare service quality at Abdelrazak Bouhara Hospital in Skikda?
- To what extent do technological and digital process capabilities contribute to enhancing the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda?
- Does the level of digital investment influence the improvement of healthcare service quality at Abdelrazak Bouhara Hospital in Skikda?

Research Hypotheses:

The study's hypotheses were formulated as follows:

Main Hypothesis:

There is no statistically significant effect of digital transformation on improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda.

Sub-Hypotheses:

Derived from the main hypothesis, the following sub-hypotheses were formulated:

- There is no statistically significant effect of digital dynamic capability on improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda, at a significance level of 0.05.

- There is no statistically significant effect of digital leadership capability on improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda, at a significance level of 0.05.
- There is no statistically significant effect of employees' digital capability on improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda, at a significance level of 0.05.
- There is no statistically significant effect of technological and digital process capabilities on improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda, at a significance level of 0.05.
- There is no statistically significant effect of digital investment capability on improving the quality of healthcare services at Abdelrazak Bouhara Hospital in Skikda, at a significance level of 0.05.

Study Objectives:

This study aims to achieve the following objectives:

- To assess the current state of digital transformation at Abdelrazak Bouhara Hospital in Skikda.
- To evaluate the quality of healthcare services provided within the hospital based on the quality dimensions considered in the study.
- To analyze the impact of the dimensions of digital transformation on improving healthcare service quality using appropriate statistical methods, and to identify which dimensions have the greatest influence on service quality improvement.
- To provide decision-makers within the hospital with practical recommendations that support their decision-making processes.

Research Methodology:

This study adopted a descriptive approach. In the theoretical section, concepts related to the study variables were presented using a range of references relevant to the topic. In the practical section, an analytical approach was applied by analyzing the questionnaire results to test the validity of the hypotheses and derive the study's findings.

Previous Studies:

- **Amina Lahmari, The Contribution of Digital Transformation in Improving the Quality of Healthcare Services: A Comparative Study of Healthcare Institutions in Khenchela, Volume 11, Issue 01, 2025.** This study aimed to evaluate the impact of digital transformation on the quality of healthcare services in Khenchela using a comparative methodology across healthcare institutions. The results showed a strong positive relationship between digital transformation and healthcare service quality. However, the analysis also revealed disparities in the level of digital transformation

implementation across institutions, negatively affecting service quality due to differences in infrastructure and staff competence.

- **Praveen Kumar Surabhi, *Digital Transformation in Healthcare Technology: A Technical Perspective*, European Journal of Computer Science and Information Technology, 13(30), 2025**. This study aimed to highlight the role of digital transformation in improving healthcare from a technical perspective. It reviewed 64 studies published between 2019 and 2025, concluding several important improvements in various areas, including enhanced security, reduced medication errors, increased diagnostic accuracy, fewer hospital readmissions, and better patient understanding of their health..

2. Introduction to Digital Transformation

2.1. Definition of Digital Transformation:

Digital transformation refers to the economic and social impacts of digitalization. To develop appropriate policies for the digital age, it is essential to understand the key elements of the evolving digital technology ecosystem, as well as the opportunities and challenges arising from its implementation. It also requires an understanding of the data revolution, as data and its flows affect individuals, the economy, and society. Additionally, it is important to identify the main characteristics of digital transformation, including how it drives new and advanced business models and its implications for public policy (OECD, 2019, p. 18)

Digital transformation involves integrating digital technologies into all aspects of an organization, fundamentally changing the way businesses operate and develop. It also entails using new digital technologies to enhance processes, improve efficiency, and support better decision-making, with the ultimate goal of achieving sustainable competitive advantage and superior performance (Moura, 2024, p. 04)

2.2 Benefits of Digital Transformation:

The main benefits can be summarized as follows (Andrew, 2014, pp. 29-73)

- Enhancing the digital customer experience through faster and more convenient digital services.
- Increasing operational efficiency and reducing costs and waste, there by improving organizational performance.
- Developing new business models that align with rapidly evolving technological advancements.
- Establishing a unified digital vision and strategy to ensure efforts are directed toward clear and specific objectives.
- Advancing leadership approaches and strengthening digital governance within the organization.

- Building strong technical and strategic capabilities in the long term, helping the organization maintain its market position.

2.3 Dimensions of Digital Transformation:

There are five main dimensions, which can be summarized as follows (Muhammad, 2025, pp. 12-17) :

- **Digital Dynamic Capability:**

  This refers to an organization's ability to observe, understand, and leverage opportunities and changes in the digital environment by adjusting its operations, resources, and strategies to keep pace with rapid technological and market developments.

- **Digital Leadership Capability:**

  This dimension highlights the role of leadership in establishing a clear digital vision, guiding and motivating employees, ensuring that digital strategies align with organizational goals, and encouraging employee participation in decision-making.

- **Employees' Digital Capability:**

  This involves the level of employees' familiarity with technology and digital skills, enabling them to efficiently use modern digital tools and contribute to the success of digital transformation, as human resources are a critical element in the process.

- **Technical and Digital Process Capability:**

  This includes digital systems, technologies, and infrastructure that facilitate data exchange and process integration, ensuring the effective use of technology to enhance organizational performance.

- **Digital Investment Capability:**

  This refers to the organization's readiness to provide the necessary human, financial, and technical resources to develop and implement digital transformation strategies sustainably. It goes beyond merely acquiring technology to include building and enhancing capabilities and infrastructure.

3. The Concept of Healthcare Service Quality

3.1 Definition of Healthcare Service Quality:

To better understand service quality, it is important to first recognize the nature of the service itself and its main characteristics. Services are intangible, meaning they cannot be evaluated or judged before they are actually experienced, unlike physical products. They are also variable, as their quality may differ from one provider to another and even from one situation to another within the same organization, which makes standardization difficult. In addition, services are inseparable, since they are produced and consumed at

the same time, making the interaction between the service provider and the customer a key factor in determining quality. These characteristics highlight the complexity of services and explain why measuring their quality is more challenging compared to tangible goods (Sianova, 2012, p. 17).

Healthcare service quality is an important concept in public health that refers to how well a healthcare system provides safe, effective, and patient-centered services that meet patients' needs and improve health outcomes. It goes beyond treatment to include prevention, accurate diagnosis, continuity of care, and overall effectiveness of services. It is also related to following safety standards, reducing medical errors, and using available resources efficiently. At the same time, it reflects the patient's experience in terms of easy access to services, good communication, quick response, and a comfortable and safe care environment. In general, good healthcare quality helps improve patient satisfaction, reduce illness and mortality, and support a healthier and more productive society (Alghamdi, 2022, p. 03).

3.2 Dimensions of Healthcare Service Quality:

The dimensions of healthcare service quality are as follows (Eskandari, 2024 , pp. 2-6):

- **Tangibility:**

  This dimension refers to the physical aspects of the healthcare organization, such as cleanliness of facilities, availability of medical equipment, and the overall appearance of staff. These elements play an important role in shaping the patient's first impression of the service.

- **Reliability:**

  It reflects the ability of the healthcare institution to deliver services accurately and consistently, including keeping appointments and providing correct diagnoses. This helps in building trust with patients.

- **Responsiveness:**

  This dimension is about how quickly and willingly staff respond to patients' needs and provide assistance. Faster response and better interaction generally lead to higher patient satisfaction.

- **Assurance and Credibility:**

  It relates to the competence and professionalism of the medical staff, as well as their ability to make patients feel safe and confident during treatment.

- **Empathy:**

  This dimension expresses the level of care and personal attention given to patients, including understanding their specific needs, listening carefully, and treating them with kindness, which enhances the overall patient experience.

4. Practical Section

4.1 Methodology and Tools

4.1.1 Study Population and Sample:

This study was conducted at Abdelrazak Bouhara Hospital in Skikda. The study population consisted of senior management, medical staff, paramedical staff, and administrative personnel, as this group is most knowledgeable about the study variables. The study sample was selected using a random sampling method, with 50 questionnaires distributed. A total of 49 questionnaires were returned, and 47 were used for statistical analysis.

4.1.2 Study Instrument:

A questionnaire was used as the data collection tool, divided into two parts:

- **Part One:** Included the personal information of the respondents, such as gender, age, educational qualification, and years of experience.
- **Part Two:** Consisted of two sections. The first section focused on digital transformation and included 20 statements divided into five groups representing the dimensions of digital transformation: digital dynamic capability, digital leadership capability, employees' digital capability, technical and digital process capability, and digital investment capability. The second section addressed healthcare service quality and included 15 statements.

A five-point Likert scale was used to measure respondents' answers to the questionnaire items, with weights assigned as indicated in the following table:

Table N°1: Five-Point Likert Scale

Level	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Mean Range	1 – 1,80	1,81- 2,60	2,61 -3,40	3,41 – 4,20	4,21- 5 ,00
Degree of Agreement	Very Low	Low	Medium	High	Very High

Source: Prepared by the researcher based on the Likert scale.

4.1.3 Reliability of the Study Instrument:

The reliability of the study instrument was tested using Cronbach's Alpha coefficient.

Table N°2: Reliability Coefficient (Cronbach's Alpha)

Study Variables	Reliability Coefficient
Digital Transformation	0,922
Healthcare Service Quality	0,870
Overall Questionnaire	0,920

Source: Prepared by the researcher based on the outputs of (SPSS V.23).

Table N° 2 shows the reliability coefficients for the questionnaire sections. The Cronbach's Alpha value for the overall questionnaire was 0.920, which is very close to 1. This indicates that the population's responses are highly consistent with those of the study sample. Therefore, the reliability of the questionnaire used in this study is considered good, confirming the validity of the study instrument.

4.1.4 Statistical Analysis Methods:

To analyze the data, test the hypotheses, and interpret the results, statistical methods were employed using the Statistical Package for the Social Sciences (SPSS V.23). These methods included descriptive statistics, such as frequencies, percentages, mean, standard deviation, and Cronbach's Alpha coefficient, as well as simple and multiple linear regression analyses.

4.2 Results Analysis:

4.2.1 Description of the Study Sample Characteristics:

The characteristics of the study sample can be presented in the following table:

Table N°3: Study Sample Characteristics

Variable		Frequency	Percentage (%)
Gender	Male	21	44,7
	Female	26	55,3
Age	Under 30 years	13	27,7
	30 to 39 years	19	40,4
	40 to 49 years	13	27,7
	50 years or older	2	4,3
Educational Qualification	Bachelor's Degree	43	91,5
	Postgraduate Degree	4	8,5
Job Level	Senior Management	8	17,0
	Medical Staff	6	12,8
	Paramedical Staff	23	48,9
	Administrative Staff	10	21,3
Years of Experience	Less than 5 years	14	29,8
	5–10 years	7	14,9
	11–15 years	20	42,6
	More than 15 years	6	12,8

Source: Prepared by the researcher based on the outputs of (SPSS V.23)

As shown in Table N° 3, the majority of the sample were female, representing (55.3%). Most of the participants were aged between 30 and 39 years (40.4%), indicating that the human resources are

relatively young. Regarding educational qualification, a significant proportion (91.5%) hold a university degree, which suggests that the sample members possess the necessary academic background to understand the study topic. Concerning job level, the majority of respondents work within the paramedical staff category (48.9%), which supports the reliability of the data related to digital transformation and healthcare service quality. Most participants reported having 11 to 15 years of experience (42.6%), indicating that the sample has sufficient experience to perform their duties efficiently.

4.2.2 Statistical Analysis of the Study Variables:

The statistical analysis of the study variables can be presented as follows:

4.2.2.1 Analysis of Sample Members' Attitudes Toward the Digital Transformation Dimension:

The results of this dimension can be summarized in the following table:

Table N°4: Results of the study sample respondents' answers regarding the digital transformation dimension.

Number	Statement	Mean	Standard Deviation	t-test Value	Sig	Level of Agreement
01	sable to adapt quickly to new technological changes.	3,85	0,978	5,969	0,000	High
02	Are continuously updated in line with recent developments.	3,64	1,072	4,082	0,000	High
03	Is able to develop innovative digital solutions when needed.	3,70	0,931	5,173	0,000	High
04	Are continuously adjusted to keep pace with digital transformation.	3,66	0,939	4,816	0,000	High
	Digital Dynamic Capability	3,712	0,867	5,632	0,000	High
05	Encourages the use of technology across all departments.	3,79	0,883	6,112	0,000	High
06	Provides a clear vision for digital transformation within the organization.	3,62	0,822	5,144	0,000	High
07	Encourages employees to engage in digital innovation.	3,57	0,878	4,484	0,000	High
08	Are made quickly and efficiently.	3,47	0,905	3,545	0,001	High
	Digital Leadership Capability	3,611	0,740	5,663	0,000	High
09	Are possessed by employees to perform their tasks effectively.	3,57	0,950	4,147	0,000	High
10	Are used effectively by employees in digital programs and applications.	3,55	0,829	4,574	0,000	High
11	Are continuously enhanced through training programs.	3,53	0,905	4,028	0,064	High
12	Are solved independently by employees.	3,64	0,735	5,954	0,000	High
	Employees' Digital Capability	3,574	0,683	5,762	0,000	High
13	Are used to manage records and appointments.	3,62	0,898	4,710	0,000	High
14	Help accelerate processes and improve performance.	3,72	0,615	8,063	0,000	High
15	Are provided for all digital systems.	3,60	0,712	5,736	0,012	High

16	Are integrated across departments in a comprehensive manner.	3,60	0,771	5,300	0,000	High
	Technical Capability and Digital Operations	3,633	0,553	7,836	0,000	High
17	Is provided to support digital transformation.	3,89	0,890	6,881	0,458	High
18	Are invested in developing modern digital systems.	3,60	0,851	4,799	0,000	High
19	Are allocated to support digital projects.	3,70	0,832	5,787	0,041	High
20	Is periodically evaluated to improve outcomes.	3,51	0,953	3,675	0,001	High
	Digital Investment Capability	3,675	0,797	5,809	0,000	High
	Represents the overall dimension of digital transformation	3,641	0,554	7,932	0,000	High

Source: Prepared by the researcher based on the outputs of SPSS (Version 23).

Based on Table N° 4, the level of digital transformation in the hospital under study was found to be high, with an overall dimension mean of (3.641) and a standard deviation of (0.554), indicating that the institution relatively adopts advanced digital practices. Furthermore, the one-sample t-test showed that all dimensions of digital transformation were statistically significant at the 0.05 significance level, reflecting a positive orientation toward digital transformation within the organization. The dimensions of the digital transformation dimension were ranked as follows:

- **Digital Dynamic Capability:** This dimension ranked first in terms of relative importance assigned by the study sample, with a mean of (3.712) and a standard deviation of (0.867), indicating a high level. This reflects the institution's strong ability to adapt to technological changes. The t-test value (T=5.632) at a significance level of 0.000 (less than 0.05) confirms that this dimension is statistically significant, meaning that the institution possesses considerable digital flexibility that enables it to keep pace with developments.
- **Digital Investment Capability:** This dimension ranked second in terms of relative importance assigned by the sample, with a mean of (3.675) and a standard deviation of (0.797), indicating a high level. This suggests that the institution places considerable attention on providing the necessary financial resources to support digital transformation projects and demonstrates awareness of the importance of investing in technology to improve healthcare services. The t-test value (T = 5.809) at a significance level of 0.000 (less than 0.05) indicates that this dimension is statistically significant.
- **Technical Capability and Digital Operations:** This dimension ranked third in terms of relative importance assigned by the study sample, with a mean of (3.633) and a standard deviation of (0.553), indicating a high level of agreement. The results of the t-test (T = 7.836) at a significance level of (Sig = 0.000) less than 0.05, show that this dimension is statistically significant at the 0.05 level. This indicates that the institution has a sound technical infrastructure and that its digital systems

effectively support operational processes. It also reflects a considerable level of competence in the use of technology and management of digital operations within the organization.

- **Digital Leadership Capability:** This dimension ranked fourth in terms of relative importance assigned by the study sample, with a mean of (3.611) and a standard deviation of (0.740), indicating a high level of agreement. This reflects a strong awareness of the role of leadership in supporting digital transformation and encouraging innovation. The t-test value (T = 5.663) at a significance level of 0.000 (less than 0.05) indicates that this dimension is statistically significant, reflecting a leadership orientation that supports digitization policies within the organization.
- **Employees' Digital Capability:** This dimension ranked last in terms of relative importance assigned by the sample, with a mean of (3.574) and a standard deviation of (0.683), indicating a high level. This suggests that the institution has leadership that is aware of the importance of digital transformation and strives to support and guide it within the organization, representing one of the institution's strengths. Although the mean is relatively high, it is the lowest among the other dimensions, highlighting the need to further enhance digital training and qualification. The t-test value (T = 5.762) at a significance level of 0.000 (less than 0.05) indicates that this dimension is statistically significant.

4.2.2.2 Analysis of Sample Members' Attitudes Toward the Healthcare Service Quality Dimension:

The results of this dimension can be summarized in the following table:

Table N°5: Results of the study sample respondents' answers regarding the healthcare service quality dimension.

Number	Statement	Mean	Standard Deviation	t-test Value	Sig	Level of Agreement
21	Provide modern medical equipment within the institution.	3,30	1,082	1,888	0,065	Moderate
22	Maintain cleanliness and organization in healthcare facilities.	3,57	0,878	4,484	0,000	High
23	Use digital tools by the medical staff while delivering services.	3,36	1,009	2,457	0,018	Moderate
	Tangible Dimension	3,411	0,828	3,402	0,000	High
24	Deliver healthcare services accurately and correctly the first time.	3,51	0,930	3,766	0,000	High
25	Adhere to scheduled appointment times for patients.	3,45	0,904	3,387	0,001	High
26	Organize and securely store medical records.	3,43	0,950	3,072	0,004	High
	Reliability Dimension	3,461	0,707	4,468	0,000	High
27	Provide healthcare services at an appropriate speed.	3,47	0,997	3,219	0,002	High
28	Respond promptly to patients' requests.	3,43	0,801	3,644	0,001	High
29	Reduce waiting time through digital systems.	3,45	0,928	3,301	0,002	High
	Responsiveness Dimension	3,446	0,726	4,216	0,000	High

30	Ensure confidence in the competence of the medical staff.	3,79	0,778	6,933	0,000	High
31	Provide a safe environment for receiving treatment.	3,62	0,848	4,986	0,000	High
32	Maintain the confidentiality of patients' information through digital systems.	3,68	0,911	5,12	0,000	High
	Assurance/Trust Dimension	3,695	0,718	6,633	0,000	High
33	Treat patients with respect and care.	3,79	0,931	5,797	0,000	High
34	Listen attentively to patients' concerns.	3,87	0,875	6,833	0,000	High
35	Consider patients' psychological and social conditions.	3,85	0,780	7,484	0,000	High
	Empathy Dimension	3,836	0,792	7,243	0,000	High
	Represent the overall dimension: Healthcare Service Quality.	3,570	0,541	7,214	0,000	High

Source: Prepared by the researcher based on the outputs of SPSS (Version 23).

It is evident from Table N°5 that the healthcare service quality dimension in the institution is at a high level, with an overall mean of (3.570) and a standard deviation of (0.541). This indicates a convergence of the sample members' responses and a low level of dispersion, reflecting a relatively consistent perception of the quality level. Furthermore, the t-test value (T = 7.214) at a significance level of (Sig = 0.000), which is less than 0.05, shows that this dimension is statistically significant at the 0.05 level. This implies that the sample holds positive opinions toward this dimension. The dimensions of the healthcare service quality axis are ranked as follows:

- **Empathy Dimension:** This dimension ranked first in terms of relative importance assigned by the study sample, with a mean of (3.836) and a standard deviation of (0.792), indicating a positive perception of staff concern for patients. The t-test value (T = 7.243) and the significance level (Sig=0.000), which is less than 0.05, show that this dimension is statistically significant at the 0.05 level. It is considered the most important element of healthcare service quality, reflecting a strong human-oriented aspect in service delivery.
- **Assurance/Trust Dimension:** This dimension ranked second, with a mean of (3.695) and a standard deviation of (0.718), reflecting a high level of patients' trust in the competence of the medical staff and the safety of the services provided. The t-test value (T = 6.633) and the significance level (Sig = 0.000), which is less than 0.05, indicate that this dimension is statistically significant at the 0.05 level.
- **Reliability Dimension:** This dimension ranked third, with a mean of (3.461) and a standard deviation of (0.707), indicating that the institution demonstrates a good level of commitment to delivering services accurately and adhering to scheduled appointments. The t-test value (T = 4.468) and the significance level (Sig = 0.000), which is less than 0.05, indicate that this dimension is statistically significant at the 0.05 level, reflecting an acceptable level of consistency in performance.

- **Responsiveness Dimension:** This dimension ranked fourth, with a mean of (3.446) and a standard deviation of (0.726), indicating that the institution demonstrates a good level of service speed, responsiveness to patients' needs, and effective handling of their complaints. The t-test value (T=4.216) and the significance level (Sig = 0.000), which is less than 0.05, show that this dimension is statistically significant at the 0.05 level. However, although the result is positive, it remains lower compared to the other dimensions, suggesting that the institution needs to make further efforts to improve response speed and efficiency, particularly in reducing waiting times.
- **Tangible Dimension:** This dimension ranked fifth and last, with a mean of (3.411) and a standard deviation of (0.828), reflecting the respondents' satisfaction with equipment, cleanliness, and the use of digital tools. The t-test value (T = 3.402) and the significance level (Sig = 0.000), which is less than 0.05, indicate that this dimension is statistically significant at the 0.05 level. Although it recorded a high level, its last ranking among the dimensions suggests that it is relatively weaker compared to the others, indicating the presence of some relative shortcomings in the physical aspects. This calls for greater attention to improving and strengthening this dimension in line with patients' expectations.

4.3 Testing The Study hypotheses:

4.3.1 Testing the Sub-Hypotheses:

The results of the simple linear regression analysis can be summarized in the following table:

Table N°6: Results of the sub-hypotheses testing

Dependent Variable	Independent Variable	Effect Coefficient (B)	Coefficient of Determination (R^2)	Correlation Coefficient (R)	F-value	Significance Level (Sig)
Healthcare Service Quality	Digital Dynamic Capability	0,390	0,555	0,745	9,023	0,000
	Digital Leadership Capability	0,228	0,383	0,619	9,293	0,000
	Employees' Digital Capability	-0,725	0,488	0,699	8,798	0,000
	Technical and Digital Process Capability	0,703	0,577	0,760	11,094	0,000
	Digital Investment Capability	0,421	0,597	0,773	14,072	0,000

Source: Prepared by the researcher based on the outputs of SPSS (Version 23)

From Table N°6, the following can be concluded:

- **Results of testing the first sub-hypothesis:** There is no statistically significant effect of Digital Dynamic Capability on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

The results of the simple linear regression analysis showed that the coefficient of determination was (R^2=0.555), meaning that this dimension (Digital Dynamic Capability) explains 55.5% of the variation in healthcare service quality. The correlation coefficient was (R=0.745), indicating a relatively strong relationship. The regression coefficient (B=0.390) is positive, indicating a direct relationship between Digital Dynamic Capability and healthcare service quality, where a one-unit change in the application of this dimension leads to a (0.390) change in healthcare service quality. The F-test also confirmed the significance of this effect, with (F = 9.023) at a significance level of (Sig = 0.000), which is less than 0.05. This means that whenever the studied institution gives more attention to applying Digital Dynamic Capability according to scientific standards, it contributes to improving the level of healthcare service quality. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which states that there is a statistically significant effect of Digital Dynamic Capability on improving healthcare service quality in the institution at the 0.05 significance level.

- **Results of testing the second sub-hypothesis:** There is no statistically significant effect of Digital Leadership Capability on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

The results of the simple linear regression analysis showed that the coefficient of determination was (R^2=0.383), meaning that this dimension (Digital Leadership Capability) explains 38.3% of the variation in healthcare service quality. The correlation coefficient was (R = 0.619), reflecting a moderate relationship. The regression coefficient is positive and statistically significant, with a value of (B = 0.228), indicating a direct relationship between Digital Leadership Capability and healthcare service quality, where a one-unit increase in the application of this dimension leads to a 0.228 increase in healthcare service quality. The F-test also confirmed the significance of this effect, with (F = 9.293) at a significance level of (Sig = 0.000), which is less than 0.05. This means that the more the institution applies Digital Leadership Capability based on scientific principles, the more it contributes to improving healthcare service quality. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which states that there is a statistically significant effect of Digital Leadership Capability on improving healthcare service quality in the institution at the 0.05 significance level.

- **Results of testing the third sub-hypothesis:** There is no statistically significant effect of Employees' Digital Capability on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

The results of the simple linear regression analysis showed that the coefficient of determination was (R^2=0.488), meaning that this dimension (Employees' Digital Capability) explains 48.8% of the variation in

healthcare service quality. The correlation coefficient was (R = 0.699), indicating a relatively strong relationship. However, the regression coefficient is negative and statistically significant, with a value of (B=-0.725), which suggests a weakness in the utilization of employees' digital skills or a lack of adequate training, leading to an inverse effect on healthcare service quality despite the availability of capabilities. The F-test also confirmed the significance of this effect, with (F = 8.798) at a significance level of (Sig=0.000), which is less than 0.05. This means that when the institution applies Employees' Digital Capability in a scientific and structured manner, it can contribute to improving healthcare service quality. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which states that there is a statistically significant effect of Employees' Digital Capability on improving healthcare service quality in the institution at the 0.05 significance level.

- **Results of testing the fourth sub-hypothesis:** There is no statistically significant effect of Technical Capability and Digital Operations on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

The results of the simple linear regression analysis showed that the coefficient of determination was (R^2=0.577), meaning that this dimension (Technical Capability and Digital Operations) explains 57.7% of the variation in healthcare service quality. The correlation coefficient was (R = 0.760), indicating a strong relationship. The regression coefficient (B = 0.703) is positive, indicating a direct relationship between Technical Capability and Digital Operations and healthcare service quality, where a one-unit increase in the application of this dimension leads to a (0.703) increase in healthcare service quality. This represents the highest impact among all dimensions, confirming the important role played by technical infrastructure and process efficiency in improving healthcare service quality. The F-test also confirmed the significance of this effect, with (F = 11.094) at a significance level of (Sig = 0.000), which is less than 0.05. This means that the more the institution applies Technical Capability and Digital Operations in a scientific and structured manner, the more it contributes to improving healthcare service quality. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which states that there is a statistically significant effect of Technical Capability and Digital Operations on improving healthcare service quality in the institution at the 0.05 significance level.

- **Results of testing the fifth sub-hypothesis:** There is no statistically significant effect of Digital Investment Capability on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

The results of the simple linear regression analysis showed that the coefficient of determination was (R^2=0.597), meaning that this dimension (Digital Investment Capability) explains 59.7% of the variation in

healthcare service quality. The correlation coefficient was (R = 0.733), which is the highest among all dimensions, reflecting a very strong relationship. The regression coefficient (B = 0.421) is positive, indicating a direct relationship between Digital Investment Capability and healthcare service quality, where a one-unit increase in the application of this dimension leads to a (0.421) increase in healthcare service quality. The F-test also confirmed the significance of this effect, with (F = 29.85) at a significance level of (Sig = 0.000), which is less than 0.05. This means that the more the institution applies Digital Investment Capability in a scientific and structured manner, the more it contributes to improving healthcare service quality. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which states that there is a statistically significant effect of Digital Investment Capability on improving healthcare service quality in the institution at the 0.05 significance level.

4.3.2 Testing the Main Hypothesis: The results of the multiple linear regression analysis can be summarized in:

Table N°7: Results of the multiple linear regression analysis for testing the main hypothesis

Independent Variable	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	Significance Level (Sig)
Digital Transformation	0,886	0,784	29,840	0,000

Source: Prepared by the researcher based on the outputs of SPSS (Version 23).

From Table N°7, the multiple correlation coefficient was (R = 0.886), indicating a strong and positive statistically significant relationship between the dimensions of Digital Transformation and Healthcare Service Quality. The coefficient of determination was (R^2 = 0.784), meaning that the dimensions of digital transformation collectively explain 78.4% of the variation in healthcare service quality, which represents a high explanatory power and reflects the strength of the model. The F-value confirms the overall statistical significance of the model, with (F=29.840) at a significance level of (Sig = 0.000), which is less than 0.05. This indicates that the model is statistically significant. It also means that the greater the institution's focus on strengthening the dimensions of digital transformation, the more it contributes to improving healthcare service quality. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which states that there is a statistically significant effect of digital transformation on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

5.Conclusion:

This study examined the impact of digital transformation in its five dimensions on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda. After analyzing the study data and testing the research hypotheses, a set of findings and recommendations was reached as follows:

5.1 Study Results :

- The results of the statistical analysis using simple linear regression showed a statistically significant effect of the independent variable dimensions (Digital Transformation) on the dependent variable (Healthcare Service Quality), as all significance values were below 0.05, confirming the rejection of the null hypotheses (H_0) and the acceptance of the alternative hypotheses (H_1).
- The correlation coefficients (R) were positive and ranged between (0.619) and (0.773), indicating a moderate to strong positive relationship between the dimensions of digital transformation and healthcare service quality. This reflects consistency between digitalization and the improvement of healthcare services within the institution. The multiple correlation coefficient (R = 0.886) also indicates a strong and positive statistically significant relationship between digital transformation and healthcare service quality.
- The coefficients of determination (R^2) ranged between (0.383) and (0.597), indicating that the dimensions of digital transformation explain a considerable proportion of the variation in healthcare service quality, while the remaining proportion is attributed to other factors outside the model. The overall coefficient of determination (0.789) reflects a high explanatory power of the model, as the dimensions of digital transformation collectively contribute significantly to explaining the variation in healthcare service quality.
- The regression coefficients (B) showed that all dimensions had a positive effect, except for the Employees' Digital Capability, which recorded a negative effect (-0.725). This suggests a deficiency in the utilization of digital skills or a lack of adequate training, which may negatively affect healthcare service quality.
- The F-test values confirm the overall statistical significance of the regression models, indicating that they are statistically significant. The values ranged between (8.798) and (14.072), which supports the validity of the models used to explain the relationship between the independent and dependent variables. The F-value of the overall model also confirmed its significance, reaching (F = 29.840) at a significance level of (Sig = 0.000), which is lower than the accepted threshold of 0.05. This means that the more the institution focuses on strengthening the dimensions of digital transformation, the more it contributes to improving healthcare service quality. Accordingly, there is a statistically significant effect

of digital transformation on improving healthcare service quality in the public hospital institution Abdel Razzaq Bouhara in Skikda at a significance level of 0.05.

- The results indicate that the studied institution has initial foundations that enable it to adopt more advanced digital strategies in the future, given the availability of basic elements of digitalization.
- Digital transformation is considered a strategic lever for improving healthcare services, as its success is not only linked to the availability of financial resources but also depends on the integration of digital infrastructure, the effectiveness of leadership, and the development of human skills.

5.2 Study Recommendations:

- Allocate a dedicated and continuous budget to support digital transformation projects.
- Regularly develop and update health information systems.
- Adopt flexible management models based on technology to allow rapid adaptation to changes.
- Develop and implement a comprehensive and integrated digital strategy that ensures coordination and integration across all departments of the healthcare institution to achieve optimal results.

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