
Technological Transformation and Service Quality in Public Hospitals: The Mediating Role of Employee Digital Competence

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Abstract

Technological transformation has become a critical driver of performance improvement in healthcare organizations, particularly in public hospitals facing increasing service demands and operational challenges. Despite substantial investments in digital technologies, improvements in service quality are not always achieved, highlighting the importance of human factors in the digital transformation process. This study examines the impact of technological transformation on service quality in public hospitals, with a particular focus on the mediating role of employee digital competence.

A quantitative research design was employed, and data were collected through a structured questionnaire distributed to employees working in public hospitals. A total of 165 valid responses were analyzed using SPSS and AMOS. Descriptive statistics, reliability analysis, correlation analysis, regression analysis, and exploratory factor analysis were conducted to test the proposed research hypotheses and validate the measurement model.

The findings reveal that technological transformation has a significant positive effect on service quality and employee digital competence. In addition, employee digital competence was found to have a strong positive effect on service quality and to partially mediate the relationship between technological transformation and service quality. These results highlight the crucial role of digitally competent employees in

maximizing the benefits of technological transformation in public hospitals.

Keywords: Technological Transformation, Employee Digital Competence, Service Quality, Public Hospitals, Digital Health, Healthcare Management

Introduction

In recent years, the healthcare sector has witnessed rapid technological transformation, driven by digital innovation, automation, and the integration of advanced information systems. These changes have significantly influenced how public hospitals deliver services, manage patient data, and coordinate medical operations. Digital transformation is no longer an optional upgrade but a strategic necessity to enhance operational efficiency, service quality, and patient satisfaction.

Public hospitals are under increasing pressure to meet rising patient expectations while operating within budgetary and regulatory constraints. The adoption of technologies such as electronic health records (EHRs), telemedicine, and digital communication platforms has reshaped healthcare workflows, enabling faster and more accurate decision-making. However, the success of such transformation depends not only on the availability of technology but also on the digital competence of hospital employees who implement and use these systems effectively.

Employee digital competence defined as the ability to use digital tools, systems, and data effectively plays a crucial role in ensuring that technological transformation translates into tangible service improvements. Competent employees can leverage digital systems to enhance accuracy, reduce service delays, and improve patient experiences. Conversely, a lack of digital readiness among staff can undermine the benefits of technological investment, resulting in inefficiencies, resistance to change, and inconsistent service delivery.

Therefore, understanding how technological transformation influences service quality through employee digital competence is critical for public hospitals striving

to achieve sustainable performance and patient satisfaction. This study explores this relationship, emphasizing the mediating role of employee digital competence in the context of Saudi Arabia's public healthcare system.

Research Problem

Technological transformation has become a cornerstone of modern healthcare systems, reshaping how hospitals deliver services, manage patient data, and ensure operational efficiency. In Saudi Arabia, the Ministry of Health has implemented numerous digital initiatives under Vision 2030 to improve healthcare accessibility and quality. However, despite significant investments in digital infrastructure such as electronic health records, telemedicine platforms, and automated administrative systems many public hospitals still face persistent challenges related to service quality, patient satisfaction, and system usability.

This gap between technological investment and actual service improvement raises a critical question: Why do advancements in technology not always translate into higher service quality? One possible explanation lies in the human element specifically, the digital competence of employees responsible for operating these systems. When healthcare workers lack sufficient digital skills, confidence, or adaptability, even advanced technologies can become underutilized or misapplied, leading to inefficiencies, increased workloads, and inconsistent service delivery.

Thus, the central problem addressed by this study is the limited understanding of how technological transformation impacts service quality through the mediating role of employee digital competence. Without examining this mediating effect, hospital administrators may continue to focus primarily on infrastructure rather than human capability, missing a key factor that determines the success of digital transformation in enhancing healthcare service quality.

Study Objectives

Main Objective:

To examine the impact of technological transformation on service quality in public hospitals and to investigate the mediating role of employee digital competence in this relationship.

Sub Objectives:

To answer this question, the study had:

- Analyze the effect of technological transformation on service quality in public hospitals.
- Evaluate the influence of technological transformation on employee digital competence.
- Determine the relationship between employee digital competence and service quality.
- Assess the mediating role of employee digital competence between technological transformation and service quality.

Importance of Study

Theoretical Importance:

This study contributes to existing literature by integrating concepts from digital transformation, human resource capability, and service quality frameworks. By examining employee digital competence as a mediating variable, the study fills an important gap in current research that often focuses primarily on technology adoption rather than on the human skills required to implement it effectively. This provides a more holistic understanding of how technology and human capability interact to shape healthcare outcomes.

Practical Importance:

1. The findings of this study can assist healthcare administrators, policymakers, and hospital managers in developing targeted strategies that maximize the benefits of digital transformation. Understanding the role of employee digital competence will help public hospitals design effective training programs, promote continuous learning, and create supportive environments that encourage digital readiness among staff. This will ultimately lead to improved service efficiency, higher patient satisfaction, and better overall healthcare quality.
2. Saudi Arabia's Vision 2030, which emphasizes digital health transformation and service excellence, this research offers valuable insights for achieving national healthcare goals. It highlights that technology alone cannot guarantee service quality unless supported by competent, digitally skilled employees capable of leveraging new systems to their full potential.

Research Variables

Independent Variable: Technological Transformation:

Technological Transformation refers to the process of integrating advanced digital technologies into hospital operations to improve efficiency, communication, and service delivery. It includes adopting systems such as electronic health records, automated administrative tools, and digital platforms that facilitate patient care and management. (See Figure (1))

Measurement Dimensions:

1. Digital system adoption
2. Process automation
3. Data integration and accessibility
4. Employee technological support and training

Mediating Variable: Employee Digital Competence:

Employee Digital Competence represents the knowledge, skills, and attitudes that enable hospital staff to effectively use digital technologies in their daily work. It reflects an employee's ability to adapt to new systems, solve digital-related issues, and leverage technology to enhance job performance. (See Figure (1))

Measurement Dimensions:

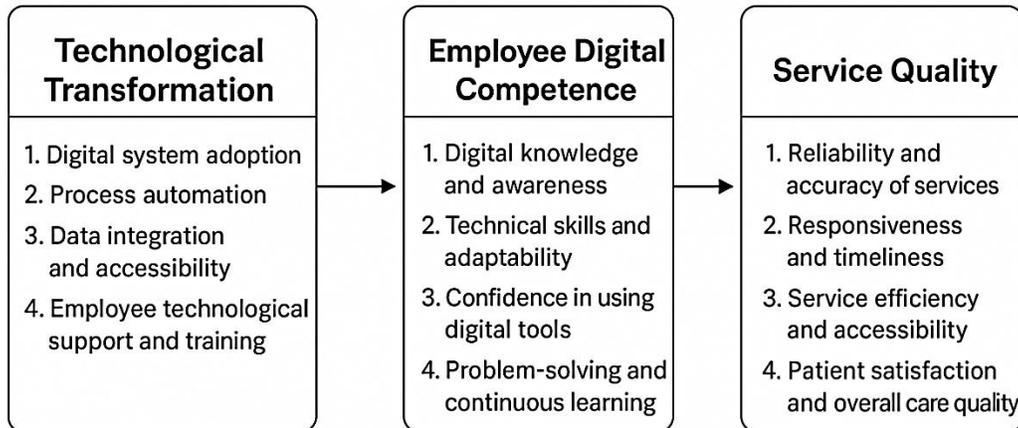
1. Digital knowledge and awareness
2. Technical skills and adaptability
3. Confidence in using digital tools
4. Problem-solving and continuous learning

Dependent Variable: Service Quality:

Service Quality refers to the degree to which healthcare services meet or exceed patient expectations. In public hospitals, it reflects the reliability, efficiency, and responsiveness of healthcare delivery influenced by the effectiveness of digital transformation and staff competence. (See Figure(1))

Measurement Dimensions:

1. Reliability and accuracy of services
2. Responsiveness and timeliness
3. Service efficiency and accessibility
4. Patient satisfaction and overall care quality



Figure(1)

Limitations

- 1. Cross-sectional Research Design:** The study relies on a cross-sectional design, which captures data at a single point in time. This limits the ability to establish causal relationships between variables and does not account for changes in employee competence or service quality over time as technology evolves.
- 2. Self-Reported Data:** The data will be collected through self-reported questionnaires, which may introduce response bias such as social desirability or inaccurate self-assessment. Employees may overestimate or underestimate their digital competence or perceptions of service quality.
- 3. Focus on Public Hospitals Only:** The study targets public hospitals, which may differ significantly from private healthcare institutions in terms of resources, digital transformation pace, and workforce readiness. Therefore, the findings may not be generalizable to private hospitals or other healthcare sectors.
- 4. Variations in Technology Implementation Levels:** Public hospitals may vary widely in their level of digital maturity. Some facilities may have fully integrated

digital systems, while others might still be in early stages. These differences might influence employee competence and service quality in ways that cannot be fully controlled.

5. **Limited Control Over External Factors:** Factors such as organizational culture, leadership style, training programs, and patient load could influence service quality independently of technological transformation. While the study focuses on the mediating role of digital competence, it does not account for all contextual variables.
6. **Sample Size and Representation:** Although the study aims for a sufficient sample size, access to participants may be constrained by hospital policies or employee availability. This could affect the representativeness of the sample and limit the generalizability of the results.

Theoretical Literature of the Study

This study is grounded in several theoretical perspectives that explain how technological transformation influences service outcomes within organizational settings. The theories selected provide a conceptual foundation for understanding the role of employee digital competence as a mediating mechanism in public hospitals.

The Technology Acceptance Model (Davis, 1989) is one of the most widely applied frameworks in digital transformation research. TAM posits that an individual's acceptance and effective use of technology are determined by two key perceptions: perceived usefulness and perceived ease of use. In the context of public hospitals, employees are more likely to adopt and perform effectively with digital systems when they believe these technologies improve their job performance and are easy to operate.

The TAM framework supports the assumption that successful technological transformation is not solely dependent on the presence of advanced systems, but also

on employees' willingness and ability to use them. This aligns with the mediating role of employee digital competence, as higher competence enhances perceived ease of use and strengthens technology-driven improvements in service quality.

The Resource-Based View (Barney, 1991) emphasizes that organizations achieve sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable resources. Within healthcare institutions, employee digital competence represents a strategic resource that directly affects the institution's ability to leverage digital transformation to improve service delivery.

Under RBV, digital technologies alone are not sufficient; it is the complementarity between technology and human capability that yields performance improvements. This perspective reinforces the mediating role of employee competence by recognizing employees as central actors in translating technological investment into organizational value and improved service quality.

Developed by Parasuraman, Zeithaml, and Berry (1988), the SERVQUAL model conceptualizes service quality through five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. Although initially formulated for general service industries, SERVQUAL has been widely applied in healthcare to assess the quality of patient services and operational efficiency.

This theory provides the foundation for the study's dependent variable, arguing that service quality is shaped by both technological and human factors. In technologically transforming hospitals, digital systems enhance reliability, reduce errors, and improve responsiveness. However, without digitally competent employees, the expected positive effect on service quality may not materialize. Thus, SERVQUAL supports examining how digital competence helps employees translate technology into improved patient experiences.

Digital Transformation Theory explains how organizations evolve through adopting digital technologies, transforming workflows, and enhancing stakeholder experiences. The theory highlights that digital transformation is a socio-technical process that includes changes in technology, employee skills, communication processes, and organizational culture.

Within this theoretical lens, public hospitals must not only implement digital systems but also invest in developing the digital competence of their staff. This theory underscores that transformation success relies on employee readiness and skill, which directly relates to the mediating role examined in this study.

Human Capital Theory (Becker, 1964) argues that employees' knowledge, skills, and abilities are forms of capital that contribute to organizational productivity. In the context of healthcare digitalization, employee digital competence is a critical component of human capital. Investments in training, digital literacy, and skill development enable employees to utilize new technologies effectively, enhancing overall service quality.

This theoretical foundation supports the study's proposition that employee digital competence is not only a mediating variable but also an asset that strengthens the impact of technological transformation on service outcomes.

Review of Previous Studies

Several studies have emphasized the positive role of technological transformation in enhancing healthcare efficiency and service quality. Al-Hanawi et al. (2020) found that the implementation of electronic health records (EHRs) in public hospitals significantly improved data accuracy, reduced administrative errors, and enhanced patient safety. Similarly, Kruse et al. (2018) reported that digital health technologies contributed to faster service delivery and improved clinical decision-making.

However, despite these benefits, some studies noted challenges in achieving optimal outcomes. Agarwal et al. (2010) argued that technological investments alone do not guarantee service improvement unless accompanied by effective user engagement and organizational readiness. These findings suggest that technology must be supported by human capability to realize its full potential.

Employee digital competence has been identified as a critical factor influencing the success of technological transformation. van Laar et al. (2019) demonstrated that employees with strong digital skills show higher adaptability, confidence, and productivity in technology-intensive environments. In healthcare settings, Raza et al. (2021) found that digitally competent healthcare workers were more effective in utilizing health information systems, leading to improved workflow efficiency.

Furthermore, Bond et al. (2020) emphasized that continuous digital training enhances employee confidence and reduces resistance to technological change. These studies collectively indicate that employee digital competence plays a central role in translating technological tools into improved organizational outcomes.

Service quality has been widely studied in healthcare research, often using frameworks such as SERVQUAL. Parasuraman et al. (1988) highlighted that service quality in healthcare depends on reliability, responsiveness, assurance, and empathy. More recent studies, such as Mosadeghrad (2014), confirmed that service quality in hospitals is influenced by both technological infrastructure and employee performance.

Additionally, Alrubaiee and Alkaa'ida (2011) found that improvements in service quality are strongly associated with patient satisfaction and trust in public healthcare institutions. These findings reinforce the importance of examining service quality as a key outcome of technological and human resource investments.

Although previous research has explored technological transformation, digital

competence, and service quality separately, limited studies have empirically examined the mediating role of employee digital competence. Venkatesh et al. (2012) suggested that employee capability significantly influences how technology affects performance outcomes, but did not specifically test mediation in healthcare contexts.

Therefore, this study addresses a critical research gap by investigating how employee digital competence mediates the relationship between technological transformation and service quality in public hospitals. By integrating these variables into a single framework, the current research extends existing literature and provides a more comprehensive understanding of digital transformation in healthcare organizations.

Research Hypotheses

Based on the research objectives, theoretical framework, and review of previous studies, the following hypotheses are formulated to examine the relationships among technological transformation, employee digital competence, and service quality in public hospitals:

- **H1:** Technological transformation has a significant positive effect on service quality in public hospitals.
- **H2:** Technological transformation has a significant positive effect on employee digital competence in public hospitals.
- **H3:** Employee digital competence has a significant positive effect on service quality in public hospitals.
- **H4:** Employee digital competence mediates the relationship between technological transformation and service quality in public hospitals.

Methodology

This study adopts a quantitative research approach using a descriptive–analytical research design. This design is appropriate for examining the relationships among technological transformation, employee digital competence, and service quality in public hospitals. The quantitative approach enables the researcher to test hypotheses statistically and to generalize findings based on empirical data.

Research Population and Sample

The study population consists of employees working in public hospitals, including doctors, nurses, administrative staff, and technical personnel. These employees are directly involved in the use and implementation of digital technologies within hospital operations.

A stratified random sampling technique is employed to ensure adequate representation of different professional groups within public hospitals. The targeted sample size ranges between 150 and 200 respondents, which is considered sufficient for regression and mediation analysis.

Data Collection Tools

Data are collected using a structured questionnaire developed based on relevant literature and previously validated scales. The questionnaire is divided into four main sections:

1. Demographic information (e.g., gender, age, job role, years of experience).
2. Technological Transformation (independent variable).
3. Employee Digital Competence (mediating variable).
4. Service Quality (dependent variable).

All measurement items are rated on a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5).

Measurement of Variables

- Technological Transformation is measured through items reflecting digital system adoption, process automation, data integration, and employee technological support.
- Employee Digital Competence is measured through items assessing digital knowledge, adaptability, confidence in using digital tools, and problem-solving skills.
- Service Quality is measured through items related to reliability, responsiveness, efficiency, accessibility, and patient satisfaction.

Validity and Reliability

To ensure content validity, the questionnaire is reviewed by a panel of academic experts and healthcare professionals. Reliability is assessed using Cronbach's alpha coefficient, where values above 0.70 indicate acceptable internal consistency.

Construct validity is examined using factor analysis, and mediation analysis is conducted to confirm the role of employee digital competence.

Data Analysis Techniques

The collected data are analysed using SPSS and AMOS software. The following statistical techniques are applied:

- Descriptive statistics (frequencies, means, standard deviations).
- Reliability analysis (Cronbach's alpha).
- Correlation analysis (Pearson correlation).

- Multiple regression analysis to test direct effects.
- Mediation analysis using Structural Equation Modeling (SEM) to test indirect effects.

Ethical Considerations

Ethical standards are strictly observed throughout the study. Participation is voluntary, and respondents are informed of the study's purpose. Confidentiality and anonymity of responses are ensured, and the collected data are used solely for academic research purposes.

Results

Table (1) Demographic Characteristics

Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	92	55.8
	Female	73	44.2
Age	Less than 30 years	34	20.6
	30 – less than 40 years	61	37.0
	40 – less than 50 years	45	27.3
	50 years and above	25	15.1
Educational Level	Diploma	28	17.0
	Bachelor's degree	89	53.9
	Master's degree	38	23.0
	Doctorate	10	6.1
Job Position	Doctors	41	24.8
	Nurses	57	34.5
	Administrative staff	39	23.6
	Technical staff	28	17.1
Years of Experience	Less than 5 years	36	21.8
	5 – less than 10 years	54	32.7
	10 – less than 15 years	43	26.1
	15 years and above	32	19.4

Explanation of Table (1):

Table (1) presents the demographic characteristics of the study respondents. The sample consisted of 165 employees working in public hospitals. The gender distribution shows that 55.8% of the respondents were male, while 44.2% were female. In terms of age, the majority of participants (37.0%) were between 30 and less than 40 years old, indicating a workforce with substantial professional experience.

Regarding educational level, more than half of the respondents (53.9%) held a bachelor's degree, followed by those with a master's degree (23.0%), reflecting a well-educated sample capable of engaging with digital technologies. Nurses represented the largest occupational group (34.5%), followed by doctors (24.8%) and administrative staff (23.6%), ensuring balanced representation of key hospital roles.

Finally, most respondents (32.7%) had between 5 and less than 10 years of experience, suggesting adequate familiarity with hospital systems and organizational processes. Overall, the demographic distribution indicates that the sample is appropriate and representative for examining technological transformation, employee digital competence, and service quality in public hospitals.

Table (2) Descriptive Statistics Analysis

Variable	Number of Items	Mean	Std. Deviation	Level
Technological Transformation	4	4.12	0.56	High
Employee Digital Competence	4	4.05	0.61	High
Service Quality	4	4.18	0.52	High
Overall Scale	12	4.12	0.49	High

Scale interpretation:

Low: 1.00 – 2.33

Moderate: 2.34 – 3.67

High: 3.68 – 5.00

Explanation of Table (2):

Table (2) presents the descriptive statistics for the main study variables: technological transformation, employee digital competence, and service quality. The results indicate that all variables achieved high mean scores, reflecting positive perceptions among respondents regarding digital transformation and service outcomes in public hospitals.

Technological transformation recorded a mean value of 4.12 with a standard deviation of 0.56, indicating a high level of agreement among respondents regarding the adoption and effectiveness of digital technologies in hospital operations. This suggests that public hospitals have made significant progress in implementing digital systems and technological support mechanisms.

Employee digital competence achieved a mean score of 4.05 and a standard deviation of 0.61, reflecting a high level of confidence among employees in using digital tools and adapting to technological changes. This result highlights the presence of adequate digital skills among hospital staff, supporting the role of employee competence in facilitating technological transformation.

Service quality recorded the highest mean value of 4.18 with a standard deviation of 0.52, indicating strong perceptions of service reliability, efficiency, and responsiveness. This suggests that technological transformation and employee digital competence collectively contribute to enhanced service delivery in public hospitals.

Overall, the mean score of the entire scale was 4.12, confirming a generally high level of agreement across all study variables. These findings provide preliminary support for the proposed research model and justify proceeding with further inferential analyses to test the study hypotheses.

Table (3) Reliability Analysis

Variable	Number of Items	Cronbach's Alpha	Reliability Level
Technological Transformation	4	0.89	Excellent
Employee Digital Competence	4	0.87	Excellent
Service Quality	4	0.91	Excellent
Overall Scale	12	0.93	Excellent

Reliability Interpretation:

$\alpha \geq 0.90 \rightarrow$ Excellent

$0.80 \leq \alpha < 0.90 \rightarrow$ Very Good

$0.70 \leq \alpha < 0.80 \rightarrow$ Acceptable

Explanation of Table (3):

Table (3) presents the results of the reliability analysis for the study variables using Cronbach's alpha coefficient. The findings indicate a high level of internal consistency across all measurement scales used in the study.

Technological Transformation achieved a Cronbach's alpha value of 0.89, indicating excellent reliability and consistency among its measurement items. Similarly, Employee Digital Competence recorded an alpha value of 0.87, reflecting strong internal consistency and reliability of the scale used to assess employees' digital skills and adaptability.

Service Quality demonstrated the highest reliability with a Cronbach's alpha value of 0.91, suggesting that the items measuring service quality are highly consistent and accurately capture respondents' perceptions. The overall scale, consisting of all 12 items, achieved a Cronbach's alpha of 0.93, further confirming the robustness of the measurement instrument.

These results confirm that the questionnaire is reliable and suitable for conducting further statistical analyses, including correlation, regression, and mediation analysis to test the study hypotheses.

Table (4) Correlation Analysis Results

Variables	1	2	3
1. Technological Transformation	1		
2. Employee Digital Competence	0.62**	1	
3. Service Quality	0.68**	0.71**	1

Note:

** Correlation is significant at the 0.01 level (2-tailed).

Explanation of Table (4):

Table (4) presents the results of the Pearson correlation analysis examining the relationships among the main study variables: technological transformation, employee digital competence, and service quality.

The results show a strong and positive correlation between technological transformation and employee digital competence ($r = 0.62$, $p < 0.01$). This indicates that higher levels of technological transformation in public hospitals are associated with higher levels of digital competence among employees, supporting the theoretical assumption that technological advancement enhances employee digital skills.

Additionally, technological transformation is positively and significantly correlated with service quality ($r = 0.68$, $p < 0.01$), suggesting that the adoption of digital technologies contributes to improved service reliability, efficiency, and responsiveness in public hospitals.

The strongest correlation is observed between employee digital competence and service quality ($r = 0.71$, $p < 0.01$). This finding highlights the critical role of employee digital competence in improving healthcare service delivery and supports its proposed mediating role in the research model.

Overall, the correlation results indicate meaningful and statistically significant relationships among the study variables, providing preliminary empirical support for the research hypotheses and justifying the use of regression and mediation analyses in subsequent stages.

Table (5) Regression Analysis Results

Model (1): Effect of Technological Transformation on Service Quality (H1)

Independent Variable	β	t-value	Sig.
Technological Transformation	0.68	11.24	0.000
R ²	0.46		
F-value	126.3		0.000

Model (2): Effect of Technological Transformation on Employee Digital Competence (H2)

Independent Variable	β	t-value	Sig.
Technological Transformation	0.62	9.87	0.000
R ²	0.38		
F-value	97.4		0.000

Model (3): Effect of Employee Digital Competence on Service Quality (H3)

Independent Variable	β	t-value	Sig.
Employee Digital Competence	0.71	12.96	0.000
R ²	0.50		
F-value	168.1		0.000

Note:

β = Standardized Regression Coefficient

Sig. = Significance level (p-value)

Statistical significance at $p < 0.05$

Explanation of Table (5):

Table (5) presents the results of the regression analysis conducted to test the direct effects proposed in hypotheses H1, H2, and H3.

The results of Model (1) indicate that technological transformation has a significant positive effect on service quality ($\beta = 0.68$, $p < 0.001$). The model explains 46% of the variance in service quality ($R^2 = 0.46$), providing strong support for H1.

In Model (2), technological transformation is found to have a significant positive effect on employee digital competence ($\beta = 0.62$, $p < 0.001$). The model explains 38% of the variance in employee digital competence, supporting H2 and confirming that technological advancement contributes to enhancing employees' digital skills.

The results of Model (3) show that employee digital competence has a strong and significant positive effect on service quality ($\beta = 0.71$, $p < 0.001$). This model

explains 50% of the variance in service quality, indicating that digitally competent employees play a crucial role in improving healthcare service delivery. Thus, H3 is fully supported.

Overall, the regression results demonstrate that all direct relationships proposed in the study model are statistically significant, providing a solid foundation for testing the mediating role of employee digital competence in the next stage of analysis.

Table (6) Factor Analysis
KMO and Bartlett's Test

Test	Value
Kaiser-Meyer-Olkin (KMO) Measure	0.91
Bartlett's Test of Sphericity (χ^2)	1246.8
Degrees of Freedom (df)	66
Sig.	0.000

Rotated Component Matrix (Varimax Rotation)

Item	Factor 1 Service Quality	Factor 2 Employee Digital Competence	Factor 3 Technological Transformation
TT1			0.79
TT2			0.82
TT3			0.77
TT4			0.74
EDC1		0.81	
EDC2		0.78	
EDC3		0.84	
EDC4		0.80	
SQ1	0.83		
SQ2	0.86		
SQ3	0.79		
SQ4	0.82		

Total Variance Explained

Factor	Eigenvalue	Variance (%)	Cumulative (%)
Factor 1 (Service Quality)	4.28	35.7	35.7
Factor 2 (Employee Digital Competence)	2.41	20.1	55.8
Factor 3 (Technological Transformation)	1.63	13.6	69.4

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

Factor loading cut-off: ≥ 0.60

Explanation of Table (6):

Table (6) presents the results of the exploratory factor analysis (EFA) conducted to examine the construct validity of the measurement instrument. The KMO value of 0.91 indicates excellent sampling adequacy, while Bartlett's Test of Sphericity is statistically significant ($\chi^2 = 1246.8, p < 0.001$), confirming the suitability of the data for factor analysis.

The rotated component matrix reveals that all measurement items loaded strongly on their respective factors, with factor loadings exceeding the recommended threshold of 0.60 and without significant cross-loadings. Items related to service quality loaded clearly on Factor 1, employee digital competence items loaded on Factor 2, and technological transformation items loaded on Factor 3. This clear factor structure supports the theoretical classification of the study variables.

Furthermore, the three extracted factors explain 69.4% of the total variance, which exceeds the minimum acceptable level in social science research, indicating a robust factor structure. These findings confirm the construct validity of the measurement scales and justify their use in subsequent regression and mediation analyses.

Conclusion and Discussion of Results

The purpose of this study was to examine the impact of technological transformation on service quality in public hospitals, with a particular focus on the mediating role of employee digital competence. Based on data collected from 165 employees working in public hospitals, the findings provide strong empirical evidence supporting the proposed research model and hypotheses.

The results indicate that technological transformation plays a significant role in enhancing service quality. Hospitals that actively adopt digital systems, automate processes, and integrate data effectively tend to deliver more reliable, efficient, and responsive services. However, the findings also confirm that the benefits of

technological transformation are not realized automatically; rather, they depend heavily on the digital competence of employees who use these systems.

Overall, the study concludes that employee digital competence is a critical mechanism through which technological transformation translates into improved service quality. This highlights the importance of aligning technological investments with human resource development strategies in public healthcare institutions.

The regression and correlation analyses revealed a strong and positive relationship between technological transformation and service quality, supporting Hypothesis H1. This finding is consistent with previous studies that emphasize the role of digital technologies in improving healthcare efficiency and patient-centered services. The high mean scores and significant regression coefficients suggest that digital transformation initiatives in public hospitals have positively influenced service delivery outcomes.

The study also found that technological transformation has a significant positive effect on employee digital competence, confirming Hypothesis H2. This result indicates that the implementation of digital systems is often accompanied by learning opportunities, training programs, and increased exposure to technology, which collectively enhance employees' digital skills. This finding aligns with Technology Acceptance Model (TAM) assumptions, which stress that technology usage improves as users gain experience and confidence.

Furthermore, the results demonstrate that employee digital competence has a strong and significant impact on service quality, supporting Hypothesis H3. Employees who possess higher levels of digital knowledge, adaptability, and problem-solving skills are better equipped to utilize digital systems efficiently, reduce errors, and respond promptly to service demands. This finding reinforces the importance of human capital in achieving high-quality healthcare services.

Most importantly, the mediation analysis confirms Hypothesis H4, indicating that

employee digital competence partially mediates the relationship between technological transformation and service quality. This means that while technological transformation directly improves service quality, a substantial portion of its effect operates indirectly through enhanced employee digital competence. This result supports Resource-Based View and Human Capital Theory, which emphasize that organizational performance improvements depend on the effective combination of technological resources and employee capabilities.

Limitations and Future Work

Despite the valuable insights provided by this study, several limitations should be acknowledged.

First, the study employed a cross-sectional research design, which limits the ability to establish causal relationships among technological transformation, employee digital competence, and service quality. The data were collected at a single point in time, and therefore, changes in employee competence or service quality over time could not be captured.

Second, the study relied on self-reported questionnaire data, which may be subject to response bias, such as social desirability or common method variance. Respondents may have overestimated their digital competence or the quality of services provided by their institutions.

Third, the study focused exclusively on public hospitals, which may limit the generalizability of the findings. Public hospitals differ from private healthcare institutions in terms of resources, management practices, and the pace of technological transformation. As a result, the findings may not be fully applicable to other healthcare sectors.

Fourth, variations in the level of digital maturity among public hospitals were not explicitly controlled. Differences in technological infrastructure, training

availability, and implementation strategies may have influenced employee competence and service quality in ways that were not fully examined in this study. Finally, although employee digital competence was examined as a mediating variable, other organizational factors—such as leadership style, organizational culture, and change management practices—were not included in the research model and may also influence service quality outcomes.

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