RESEARCH ARTICLE

The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela

Telil Asma

Laboratoire des sciences économiques et de gestion

Université Mohamed khider Biskra -Algérie-

Algeria

Email Id: assmaatellil@gmail.com, Asma.telil@univ-biskra.dz

Hecini Ibtissem

Laboratoire des sciences économiques et de gestion

• Université Mohamed khider Biskra -Algérie

Algeria

Email Id- btissem.hecini@univ-biskra.dz

Abstract

This study aimed to analyze the impact of electronic management on citizen satisfaction with health services in public healthcare institutions, while examining the mediating role of healthcare service quality. A questionnaire was used to collect data from 194 citizens who regularly visit public health institutions. The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the proposed hypotheses. The results confirmed a significant direct positive impact of electronic management on both healthcare service quality and citizen satisfaction, in addition to an indirect effect through service quality. Based on these findings, the study recommends enhancing electronic systems within healthcare institutions, training staff on their use, and strengthening digital communication channels between citizens and healthcare providers to ensure a responsive and efficient service delivery.

Introduction

In light of the rapid technological developments, electronic management (e-management) has become one of the essential elements in improving the efficiency and quality of services provided across various sectors, whether

378 – www.imcra.az.org, | Issue 8, Vol. 8, 2025

The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

public or private. This is a result of the adoption of what is known as digital transformation, which can be defined as the process of converting traditional activities, procedures, and functions into electronic systems that rely on modern technology, thus contributing to performance improvement and procedure simplification. Many public institutions have adopted this approach, including public health institutions, where the application of electronic management has become an urgent necessity to ensure the provision of high-quality health services that efficiently and effectively meet the needs of citizens.

The quality of health services is considered a key indicator of the effectiveness of the health system in meeting beneficiaries' expectations. This quality includes several dimensions, such as efficiency, responsiveness, empathy, and reliability. Most studies have shown and agreed that improving the quality of health services leads to increased satisfaction of patients and beneficiaries of these services, which raises the level of trust in health institutions, especially public ones, and encourages continuous use of their services.

Citizen satisfaction with health services is an important indicator of the success and effectiveness of health institutions, and this satisfaction may be affected by several factors, including the quality of services provided, ease of access, and effective communication with healthcare providers. Research has shown a positive relationship between the quality of health services and beneficiary satisfaction, where improving quality leads to increased satisfaction and trust in the health system.

Therefore, this study will attempt to explore the relationship between electronic management and citizen satisfaction, in the presence of healthcare service quality as a mediating variable. Through analyzing this relationship, we aim to present recommendations that will contribute to improving the applications of electronic management in the healthcare sector, with the aim of enhancing the quality of services provided and increasing beneficiary satisfaction, which will positively impact public health and the effectiveness of the healthcare system as a whole.

Problem Statement

The problem posed by this study is essentially related to the extent of the impact of the application of electronic management on citizen satisfaction in public health institutions, considering the quality of health services as a mediating variable. Despite the rapid technological progress and the relative adoption of digital transformation by public health institutions to improve performance and service quality, achieving sustainable citizen satisfaction with these services remains somewhat complex. Accordingly, we raise the following main question:

To what extent does electronic management affect citizen satisfaction with the health services provided in public health institutions, considering healthcare service quality as a mediating variable?

In order to cover all aspects of the main question, the following sub-questions must be raised:

- Is there a direct impact of electronic management in public health institutions on citizen satisfaction?

- Is there a direct impact of electronic management on the quality of health services in public health institutions?

- Is there a direct impact of healthcare service quality in public institutions on citizen satisfaction?

- Is there an indirect impact of electronic management in public health institutions on citizen satisfaction through healthcare service quality?

Study Hypotheses

Based on the sub-questions raised, the study hypotheses can be formulated as follows: H1: There is a positive and direct effect of electronic management in public health institutions on citizen satisfaction.

379 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

H2: There is a positive and direct effect of electronic management on the quality of health services in public health institutions.

H3: There is a positive and direct effect of the quality of health services in public institutions on citizen satisfaction.

H4: There is a positive and indirect effect of electronic management in public health institutions on citizen satisfaction through the quality of health services.

Importance of the Study

This study is of great importance, especially in light of the rapid technological changes taking place in public health institutions. It aims to explore the impact of applying electronic management on citizen satisfaction and healthcare service quality, using Partial Least Squares Structural Equation Modeling (PLS-SEM) as a main analytical tool. This study provides a precise methodological framework for analyzing the relationships between these variables, which may contribute to providing in-depth scientific insights into how to improve institutional performance. Thus, the expected results may help decision-makers in the healthcare sector with effective tools for developing digital transformation strategies, enhancing the efficiency and quality of services provided to citizens. The results of this study may also contribute to bridging current research gaps, especially in local studies, and provide a scientific reference for future studies in this field.

Objectives of the Study

Through this study, we aim to achieve the following objectives:

- Analyze the impact of applying electronic management on the quality of health services in public health institutions by studying the direct relationship between the adoption of electronic management and the improvement of the quality of health services provided.

- Explore the role of healthcare service quality as a mediating variable between electronic management and citizen satisfaction by examining how healthcare service quality affects the relationship between the application of electronic management and citizen satisfaction.

- Identify the challenges and obstacles facing the application of electronic management in public health institutions.

- Provide strategic recommendations to improve electronic management applications in public health institutions.

- Attempt to provide in-depth scientific insights that may contribute to enhancing institutional performance in the healthcare sector.

Study Methodology

This study adopts the deductive approach, starting from general hypotheses or theories and then testing and applying them to specific phenomena or problems in public health institutions. This approach is usually used to determine the relationships between variables, such as the impact of applying electronic management on the quality of health services and citizen satisfaction. The study relied on Structural Equation Modeling (SEM) as the main analytical tool. This methodology is one of the recognized methods in management research, as it allows the analysis of complex relationships between latent variables, providing a deeper understanding of the studied phenomena.

1. Literature Review and Hypothesis Building

1.1. Electronic Management

380 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

Electronic management is a modern approach that relies on the use of information technology and computer systems to manage and simplify operations within business organizations. This approach aims to improve efficiency and increase communication by providing advanced tools and software that support various aspects of project management.

Electronic management is a comprehensive term that refers to many models of e-business, which include tools for transparent information exchange and online collaboration among various parties in the supply chain. Electronic management includes all processes that ensure alignment between business departments and information technology, enabling them to deliver the required level of service and provide the security and performance needed for successful e-business (Seresht, Fayyazi, & Asl, 2008).

Electronic management, also referred to as digital management, is a relatively modern trend in managing organizations that relies on the use of information technology and digital tools to improve internal processes and increase communication capabilities among various departments (Khachan, 2022). This approach enables the use of electronic systems to facilitate daily operations, such as project management, performance monitoring, and communication between employees and customers, contributing to increased efficiency and reduced costs. Electronic management (e-management) is a modern approach to organizational management that depends on the use of advanced information and communication technology (ICT) (Vilkaite-Vaitone & Povilaitiene, 2022).

Electronic management has significantly evolved with the advancement of internet systems and digital technologies. Initially, it was mainly associated with information transfer through electronic channels, but over time, its functions have expanded to include a wide range of administrative processes. Electronic management can be defined as a process that uses advanced information and communication technology in internal and external management, including information management and distribution, service provision, marketing, and decision-making (Vilkaite-Vaitone & Povilaitiene, 2022).

The use of electronic management in institutions, regardless of their form and field of activity, undoubtedly brings great benefits due to its importance, which can be clarified in the following points:

- **Improving operational efficiency**: It contributes to speeding up document circulation and reducing processing time, which increases overall institutional productivity (Jiang, 2023).

- **Reducing costs**: Electronic management helps reduce both time and material expenses by shifting from paper-based processes to digital systems (Yacine, Djamel, & Adel, 2024).

- **Improving the quality of educational processes in educational institutions**: Electronic management allows for improved quality of educational services and the integration of technology in innovative ways to enhance student experience and satisfaction (Al Shobaki, Naser, Amuna, & El Talla, 2017).

- **Data protection**: Electronic management systems provide high data security, increasing the ability to face cyber threats and ensuring safe information storage.

- **Achieving competitive advantage**: Electronic management plays a major role in enhancing institutional competitiveness by simplifying administrative processes and boosting operational efficiency, including improving decision-making speed, reducing costs, and increasing the quality of services provided (Ali Salah, 2022).

- **Achieving transparency**: Electronic management contributes to providing a transparent working environment by making information accessible to all relevant parties within institutions and reducing administrative corruption (Hochstetter, Vásquez, Diéguez, Bustamante, & Arango-López, 2023).

- **Improving decision-making**: It helps in quickly and accurately collecting and analyzing data, supporting decision-makers with updated and reliable information (El Khatib, Al Mulla, & Al Ketbi, 2022).

- **Improving interaction and communication**: It contributes to improving communication channels inside and outside the institution, facilitating cooperation between departments, suppliers, and customers.

381 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

- **Supporting innovation and development:** It provides an appropriate environment for adopting new digital solutions and developing creative and innovative processes to meet changing market needs.

- **Achieving customer satisfaction:** Electronic management enables faster and more accurate service delivery, contributing to improved customer experience and satisfaction.

1.2. Quality of Health Services

Awareness among healthcare service consumers in developing countries of their right to receive quality health services has been noticeably increasing. This growing and continuous awareness has highlighted the importance of improving the quality of services provided in healthcare institutions, a topic that is receiving increasing attention in modern studies. This has led stakeholders in the healthcare sector and governmental bodies to give greater importance to delivering high-quality health services (Abuosi & Atinga, 2013).

The quality of healthcare services is a multidimensional concept that encompasses various essential aspects of providing effective and satisfactory care to patients. The quality of healthcare services is usually evaluated from the perspective of the patient or the recipient of health services, meaning an attempt to understand how patients perceive the healthcare they receive, which is crucial for effectively assessing service quality.

Service quality is defined as the gap between the customer's expectations of the service and their perception of the actual service experience (Singh, 2022). This indicates the extent to which the delivered service aligns with the customer's expectations and personal experiences. The well-known service quality model, SERVQUAL, introduced by Parasuraman in 1985, revolutionized the measurement of customer perceptions regarding service quality provided by service providers in various sectors. This model was later adopted to measure service quality in different sectors, including the field of health services (Itumalla, Acharyulu, & Shekhar, 2014). Healthcare service quality refers to the extent to which healthcare services meet patients' needs and expectations while ensuring safety, effectiveness, and satisfaction (Wang, Huang, & Ou, 2024). This definition indicates that healthcare service quality is measured by the ability of the services provided to meet patients' various needs, whether physical or psychological, and to fulfill their expectations regarding healthcare.

In the context of studying the quality of healthcare services, the SERVPERF scale identifies five main dimensions that are essential for evaluating the quality of services provided in healthcare settings. Generally, these dimensions are as follows (Alraimi & Shelke, 2023):

Tangibles: This dimension refers to the physical, tangible aspects related to healthcare services, such as the appearance of medical facilities, the cleanliness and maintenance of equipment, and the appearance of staff. These elements contribute to forming patients' first impressions of the quality of care provided, as a clean and organized environment is considered essential for increasing patients' satisfaction and trust in the healthcare system.

The interest in ensuring citizen satisfaction with public services has increased, as citizen satisfaction is the primary goal of the government in providing these services. From this standpoint, public service institutions today face great challenges in meeting the growing demand for high-quality and efficient services compared to the past. These institutions are responsible for delivering distinguished services that meet citizens' needs in accordance with the required standards. Thus, the topic of citizen satisfaction with public services has become a major concern for academics and researchers in the fields of governance and public administration (Lamsal & Gupta, 2022).

Reliability: Reliability is the ability of health institutions to deliver promised services accurately and consistently. This means providing error-free and consistently dependable services, which increases patients' trust in service providers. Therefore, reliability is essential for building a long-term relationship between patients and the health institution.

Responsiveness: This dimension reflects the readiness of healthcare providers to respond to patients' needs and to deliver services quickly and efficiently. This includes promptly addressing patients' inquiries and fulfilling their requests. Quick response is one of the main factors in improving the patient experience and increasing their satisfaction with the services they receive.

The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

Empathy: Empathy focuses on providing personalized care that shows understanding of patients' needs and concerns. This dimension requires healthcare providers to give special attention to each patient, creating a supportive environment and a sense of psychological comfort. Empathizing with patients can help build a strong relationship between patients and healthcare providers.

Assurance: Assurance relates to the knowledge, professionalism, and expertise of healthcare workers, as well as their courteous behavior and ability to instill confidence in patients. This dimension is especially important because patients need to feel safe and confident in the competence of service providers, particularly in situations concerning their health and lives.

1.3. Citizen Satisfaction

Most citizens express their opinions about public services provided in their local areas even if they do not frequently use these services (Van de Walle & Van Ryzin, 2011). These opinions reflect the direct or indirect impact of such services on their daily lives. Thus, their perspectives serve as a mirror of the quality of these services and the extent to which they meet expectations. Citizen satisfaction with public services is defined as individuals' evaluation of the quality of services provided by governmental entities. This satisfaction is influenced by multiple factors, including trust, staff skills, procedural efficiency, time and cost savings, and the level of care and support provided to citizens (Kurti & Kina, 2024).

In a study, the factors affecting citizen satisfaction with public services were categorized into the following elements (Dvir, Liu, Geva, & Vedlitz, 2024):

- **Costs:** Costs are one of the main factors affecting citizens' evaluation of public service quality. Citizens prefer to pay lower costs for services, whether through taxes or local fees. Studies indicate that citizens are willing to pay more if the public services they receive are of high quality.

- **Completion Time (or Service Delivery Time):** The time taken to provide the service is a key aspect of public service quality. This reflects citizens' expectations regarding how quickly they receive services. Unjustified service delays significantly reduce citizen satisfaction. This dimension is essential in evaluating services that require immediate intervention, such as police, ambulance, or internet services. By reducing waiting times and improving service delivery processes, governments can enhance citizen satisfaction and increase public trust in institutions.

- **Professionalism:** This dimension concerns the competence and capability of public service employees to perform their tasks appropriately. The professional behavior of service providers plays a crucial role in shaping citizens' impressions. When government service employees demonstrate competence and professionalism, citizens are more likely to trust the quality of services. Conversely, unprofessional or disrespectful behavior leads to citizen dissatisfaction. Professionalism includes factors such as employee knowledge, communication skills, and commitment to meeting citizen needs.

- **Responsiveness:** This refers to how quickly service providers respond to citizens' requests and complaints. In most public services, delays in responding to inquiries or complaints signal inefficiency and lead to lower citizen satisfaction. Citizens expect prompt and effective responses, especially in urgent matters. Many governments provide services via digital platforms or emergency hotlines to ensure rapid responses. In this context, modern technology plays a vital role in improving how public institutions respond to citizens' demands.

- **Service Notifications:** Transparency in providing information is an essential part of improving public service quality. When citizens have clear and accurate information about public services, they are better able to track changes that may affect their daily lives. For example, information on service schedules, policy changes, or service updates contributes to increasing citizen satisfaction. Governments that strive to provide constantly updated notifications show concern for citizen needs, increasing their sense of reassurance and helping build trust with the public.

383 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

- **Comparisons with Past Performance:** This dimension depends on comparing the current performance of public services with past performance. Citizens' evaluation of service quality is affected by their perception of previous performance. For instance, if there have been improvements in public services compared to the past, citizens will see these as indicators of government efficiency. Conversely, if services have deteriorated, citizens may feel disappointed. This makes the dimension a key element in shaping citizen expectations and attitudes toward current services.

- **Social Comparisons:** This dimension includes citizens' evaluation of public service quality by comparing the performance of their institutions with similar institutions in other areas. Citizens tend to compare the performance of their local or national governments with other governments, either within the same country or in other countries. If citizens perceive that the public services they receive are of lower quality than those available elsewhere, their satisfaction may be negatively affected. This type of comparison is a crucial reference for understanding how to improve public services based on citizen expectations shaped by the experiences of others.

2. Method and Tools

2.1. Study Tool

The paper-based questionnaire was used as the primary tool for data collection. It was designed based on previous studies that addressed the study variables in order to measure the impact of electronic management on citizen satisfaction with health services, incorporating the quality of health services as a mediating variable in the relationship. The questionnaire included 26 items distributed across three main axes: electronic management (8 items) (Al-Tell, 2024), healthcare service quality (10 items) (Kitapci, Akdogan, & Dortyol, 2014), and citizen satisfaction (8 items) (Kitapci et al., 2014; Abdullah et al., 2023).

All items were measured using a five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree), allowing a relatively accurate assessment of respondents' attitudes and opinions. The questionnaire was reviewed by experts in the field to ensure content validity and clarity of the items. A pilot study was also conducted on a limited sample to verify ease of understanding and the reliability of the tool before the final distribution.

2.2. Study Sample

The study sample consisted of 194 Algerian citizens who were frequent visitors to public hospitals and clinics in Khenchela province. The sample was selected using the "simple random sampling" method to ensure proper representation of various segments of society. The study relied on the paper-based questionnaire as a data collection tool, which enabled direct interaction with the targeted participants within public hospitals.

The sample took into account diversity in terms of age, educational level, and frequency of hospital visits to ensure comprehensive results and their ability to provide an accurate picture of the impact of electronic management on citizens' satisfaction with health services.
The sample size was determined based on appropriate statistical criteria for data analysis using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method, which allows for accuracy in interpreting relationships between variables. The following table presents the descriptive data of the study sample.

2.3. Analysis

The data was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through the SmartPLS 4 software, which is one of the relatively modern methods suitable for testing models containing mediating variables and indirect relationships.
A distinctive feature of this method is its ability to handle relatively small sample sizes. It also facilitates the analysis of causal relationships between variables in a more flexible manner compared to traditional models.

The study model in this method consists of two models:

384 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

- A measurement model that explains the relationship between the latent variable and the items used for measurement.

- A structural model that explains the relationship between latent variables (Zhang, 2022).

3. Results

The process of analyzing the study model using PLS-SEM must pass through two main stages:

- **Analysis of the measurement model**

- **Analysis of the structural model**

Each model will be analyzed separately as follows:

3.1. Measurement Model Analysis

This process also goes through two indispensable steps:

- **Convergent validity analysis** (Amora, 2021)

- **Discriminant validity analysis** (Rasoolimanesh, 2022)

First: Definition of Convergent Validity

Convergent validity is one of the standards used to evaluate the quality of measurement tools in studies that rely on Structural Equation Modeling (SEM). It refers to the extent to which indicators associated with the same latent variable are consistent — in other words, how well they measure the theoretical construct they are designed to assess.

Convergent validity is achieved when the items measuring the same variable are strongly correlated, reflecting internal consistency among these indicators. Therefore, verifying convergent validity is essential to ensure that the study model relies on accurate and effective measurement tools.

Generally, there are four main criteria used to confirm the presence of convergent validity (Cheung, Cooper-Thomas, Lau, & Wang, 2024):

- **Factor Loadings:** The standardized loadings of the indicators associated with each latent variable should be equal to or greater than 0.70. However, indicators with loadings between 0.40 and 0.70 can be retained if they contribute to improving the Average Variance Extracted (AVE), as noted by researchers.

  In the study model, all standardized loadings for the indicators associated with the three variables (electronic management, healthcare service quality, and citizen satisfaction) that were retained in the model fell within acceptable limits. This indicates strong consistency between the indicators and their respective   latent   variables.
  Meanwhile, indicators that did not meet the required conditions were excluded, specifically: 2 indicators from the electronic management variable,

  3 indicators from the healthcare service quality variable, and1 indicator from the citizen satisfaction variable.

- **Average Variance Extracted (AVE):** AVE represents the proportion of variance explained by the latent variable in its indicators compared to the variance due to error. The AVE value for each latent variable should exceed 0.50. In the current model, all AVE values were above the minimum threshold, indicating that each variable explained more than half the variance in its indicators.

The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

- **Composite Reliability (CR)**: Internal consistency is a measure of the degree of correlation among indicators associated with the same latent variable. The acceptable minimum value for CR is 0.70. In our study model, the CR values were within the acceptable range, reflecting good reliability and confirming internal consistency among the indicators used to measure each latent variable.

Cronbach's Alpha Value:

Cronbach's Alpha values above 0.70 are generally accepted as indicating good reliability. In this model, Cronbach's Alpha values for all variables were above 0.70, indicating that the measurement instruments used were reliable and consistent.

Based on the evaluation of the four criteria (factor loadings, AVE, CR, and Cronbach's Alpha), it can be confirmed that the study model achieves convergent validity. For more details, see Table (01).

Table (01): Convergent Validity Analysis of the Study Model

Composite Reliability	Cronbach's Alpha	AVE	Factor Loadings	Items	Variable
0.866	0.802	0.661	0.801	Em1	Electronic Management (Em)
			0.822	Em2	
			0.747	Em3	
			0.763	Em4	
			0.715	Em5	
			0.830	Em8	
0.701	0.769	0.654	0.666	Sa1	Citizen Satisfaction (Sa)
			0.775	Sa2	
			0.730	Sa3	
			0.658	Sa5	
			0.704	Sa6	
			0.773	Sa7	
			0.702	Sa8	
0.843	0.727	0.533	0.729	Shq1	Health Service Quality (shq)
			0.677	Shq5	
			0.659	Shq6	
			0.750	Shq7	

Composite Reliability	Cronbach's Alpha	AVE	Factor Loadings	Items	Variable
			0.691	Shq8	
			0.810	Shq9	
			0.712	Shq10	

Source: Prepared by the researchers based on Smart PLS V4 output.

Second: Discriminant Validity

Discriminant validity is the ability of the measurement tool to distinguish between different concepts or variables, ensuring that there are no high correlations between scales measuring different traits. Two primary criteria are used to evaluate discriminant validity:

- **Fornell-Larcker Criterion:**

This criterion is based on comparing the square root of the AVE for each variable with the correlations between that variable and the other variables in the model. Discriminant validity is confirmed when the square root of AVE for any variable is greater than its highest correlation with other variables (Hilkenmeier et al., 2020), which is fulfilled in our study.

- **Heterotrait-Monotrait Ratio (HTMT):**

This measures the ratio of the average correlations between indicators of different constructs (heterotrait) to the average correlations between indicators of the same construct (monotrait) (Henseler, Ringle, & Sarstedt, 2015). Discriminant validity is considered achieved if the HTMT value is less than 0.90, indicating that the measured constructs are distinct and not overlapping. For more details, see Tables (02) and (03).

Table (02): Fornell-Larcker Criterion Test

	Electronic Management	Health Service Quality	Citizen Satisfaction
Electronic Management	0.781		
Health Service Quality	0.755	0.720	
Citizen Satisfaction	0.637	0.645	0.717

Source: Smart PLS v4 Output

Table (03): HTMT Statistics

	Electronic Management	Health Service Quality	Citizen Satisfaction
Electronic Management			
Health Service Quality	0.882		

387 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

	Electronic Management	Health Service Quality	Citizen Satisfaction
Citizen Satisfaction	0.728	0.752	

Source: Smart PLS v4 Output

2.3. Structural Model Analysis

The structural model analysis of the study also proceeds through a set of stages, each of which will be addressed individually.

First: Variance Inflation Factor (VIF)

The VIF is used to analyze the issue of multicollinearity between independent variables, which may affect the stability and accuracy of the structural model. Multicollinearity refers to a high correlation between independent variables, leading to inflated estimation errors. Optimal VIF values should be below 3, and in some cases, values up to 5 are acceptable (O'Brien, 2007). Values exceeding this threshold suggest the need to reduce indicators or revise the model.

As shown in Table (04), the VIF values for all indicators met the required condition, ranging between 1.484 and 3.924.

Table (04): Variance Inflation Factor (VIF)

Indicators	VIF	Indicators	VIF
Em1	1.907	Sa6	3.181
Em2	3.055	Sa7	3.880
Em3	1.949	Sa8	3.271
Em4	1.965	Shq1	2.226
Em5	1.616	Shq10	1.738
Em8	3.835	Shq5	1.484
Sa1	3.924	Shq6	1.555
Sa2	3.555	Shq7	1.893
Sa3	3.784	Shq8	1.495
Sa5	1.546	Shq9	2.803

Source: Smart PLS v4 Output

388 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

Second: Coefficient of Determination (R²)

The R² value represents the percentage of variance in the dependent variable explained by the independent variables and is a key indicator of the quality of the structural model. Higher R² values indicate stronger explanatory power, while lower values reflect weaker models. In the current study model, the R² value for the main dependent variable "citizen satisfaction" was 0.444, indicating a moderate explanatory power. This means that the independent variables "electronic management" and "health service quality" together explain approximately 44.4% of the variance.

Third: Hypothesis Testing (Path Coefficients)

Hypothesis testing is used to evaluate the strength of relationships between independent and dependent variables in the structural model.

Path coefficients express the strength of these relationships, and their impact is assessed through statistical significance.
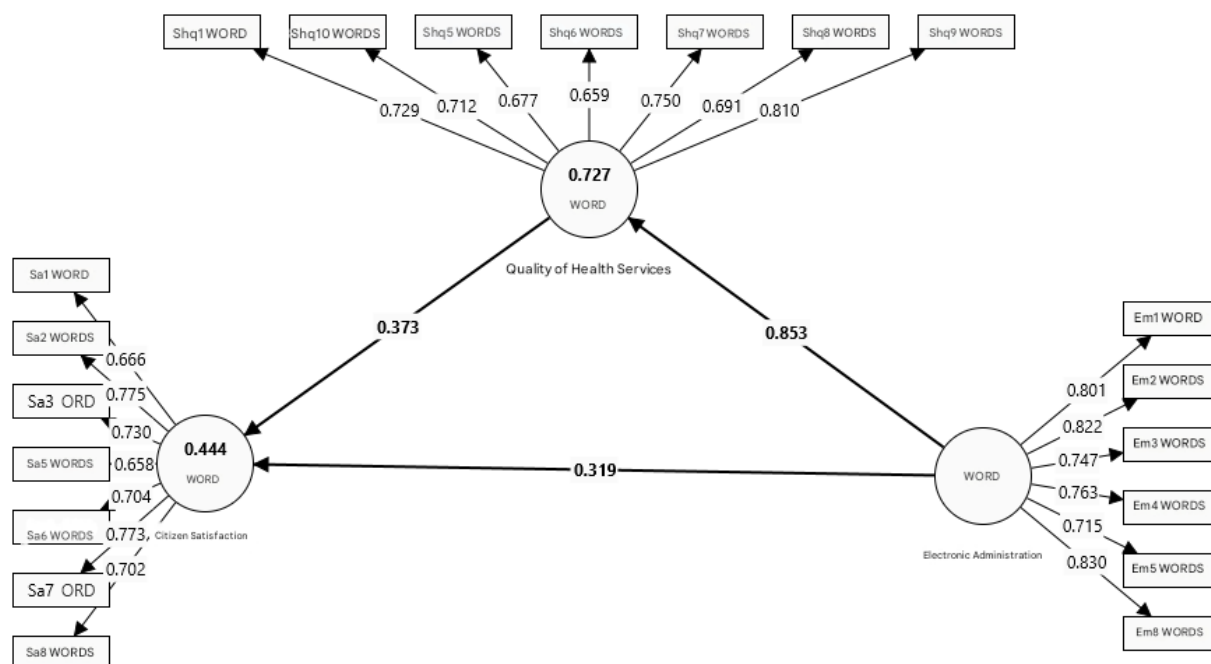
It is worth noting that the study model includes two types of hypotheses: direct and indirect. All hypotheses were accepted and statistically significant at the 5% significance level. Table (05) and Figure (01) present the hypotheses in detail.

Table (05): Hypothesis Testing Results for the Study Model

Hypotheses	Path Coefficients (B)	Standard Deviation	t-Statistic	p-value
Electronic Management → Health Service Quality	0.853	0.133	0.377	0.011
Health Service Quality → Citizen Satisfaction	0.373	0.544	0.447	0.000
Electronic Management → Citizen Satisfaction	0.319	0.119	1.671	0.000
Electronic Management → Health Service Quality → Citizen Satisfaction	0.272	0.688	0.677	0.048

Source: Based on Smart PLS v4 Output

Figure 01 :

389 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

Fourth: Effect Size (f²)

Effect size helps to determine the extent to which the independent variables contribute to explaining the variance in the dependent variables. High values of f² indicate a strong effect, while small values suggest a limited impact (Ramayah, Cheah, Chuah, Ting, & Memon, 2018). In the current study model, the effect size of the variable **electronic management** was **0.191**, which means that electronic management accounts for **19.1%** of the changes in citizen satisfaction. In contrast, the effect size of the variable **health service quality** was **0.298**, indicating that health service quality explains **29.8%** of the variance in the main dependent variable, i.e., citizen satisfaction

4. Discussion of Results

The results of the structural model analysis confirmed the validity of the four proposed hypotheses, which enhances the scientific understanding of the relationship between electronic management and citizen satisfaction with health services in public healthcare institutions, while also emphasizing the mediating role of health service quality.

Hypothesis 1: Direct relationship between electronic management and citizen satisfaction

The results confirmed the validity of **Hypothesis 1 (H1)**, which assumes a **positive direct effect** of electronic management on citizen satisfaction. This effect reflects the importance of adopting information and communication technologies to improve the citizen's experience within healthcare institutions. Electronic systems help facilitate access to services, reduce waiting times, and increase transparency, all of which contribute to greater satisfaction among health service users. This finding aligns with previous studies, such as **Bhuvana & Vasantha (2020)**, which confirmed that digital transformation in the health sector leads to improved satisfaction levels among patients and citizens.

Hypothesis 2: Direct impact of electronic management on health service quality

The study confirmed the validity of **Hypothesis 2 (H2)**, which indicates a **positive and direct effect** of electronic management on the quality of health services. This can be explained by the fact that relying on electronic systems in healthcare institutions contributes to operational efficiency, reduces administrative and medical errors, and improves the management of appointments and medical records. Therefore, applying electronic management enhances the quality of services provided, which reflects positively on the overall performance of the healthcare institution. This is consistent with the findings of **Hadwich et al. (2010)**.

390 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

Hypothesis 3: Relationship between health service quality and citizen satisfaction

The results also validated **Hypothesis 3 (H3)**, which assumes a **positive and direct effect** of health service quality on citizen satisfaction. This supports the idea that improving quality—whether in terms of medical efficiency, service availability, or patient interaction—directly contributes to increased satisfaction levels. This finding is consistent with previous literature which confirms that the quality of health services is a decisive factor in shaping the impressions of patients or citizens about the performance of healthcare institutions (**Khoirunnisa & Ramadhika, 2024**).

Hypothesis 4: The mediating role of health service quality

As for **Hypothesis 4 (H4)**, the results showed that there is a **positive and indirect effect** of electronic management on citizen satisfaction through health service quality. This indicates that electronic management not only directly affects satisfaction but also does so indirectly by improving service quality, which in turn enhances satisfaction levels. This outcome reflects the importance of integrating digital transformation with service quality improvements. It shows that merely developing electronic systems is not enough—there must be continuous enhancement of service quality to ensure citizen satisfaction.

Conclusion

In light of the digital transformation occurring in the healthcare sector, electronic management has become a **necessary tool** for improving the efficiency and quality of services provided, thereby increasing citizen satisfaction with public healthcare institutions.
This study aimed to analyze the relationship between **electronic management** and **citizen satisfaction** with health services while examining the **mediating role** of **health service quality**. The results ultimately showed that adopting electronic management contributes to improving the quality of health services, which leads to increased satisfaction among citizens.
The study emphasized the importance of leveraging digital technology in managing healthcare institutions and highlighted the need for **integrating electronic management with service quality improvements** to achieve the best outcomes.

This calls for the adoption of **effective strategies** to ensure beneficiary satisfaction and to strengthen trust in public health institutions.

Study Findings

1. There is a **direct positive impact** of electronic management on citizen satisfaction, highlighting the importance of digital transformation in improving user experience.

2. Electronic management **positively affects the quality of health services** by improving efficiency, reducing errors, and enhancing medical record management.

3. The **quality of health services** has a **direct and positive effect** on citizen satisfaction, emphasizing the importance of improving service delivery to boost trust.

4. Health service quality **plays a mediating role** in the relationship between electronic management and citizen satisfaction, indicating that attention to quality is crucial for maximizing the benefits of digital transformation.

5. The study found that the use of technology in management **increases the responsiveness** of healthcare institutions to citizens' needs, thus raising overall satisfaction levels.

6. **Digital transformation enhances transparency** in healthcare service delivery, reducing bureaucracy and facilitating efficient access to services.

391 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

Study Recommendations

1. **Support digital transformation** in public healthcare institutions by providing integrated electronic systems that facilitate service delivery.

2. **Focus on improving the quality of health services** alongside the implementation of electronic management to ensure citizen satisfaction.

3. Provide **training programs** for healthcare workers to ensure optimal use of electronic systems and maximize their benefits.

4. **Develop supportive government policies** for adopting digital transformation in the health sector, including investments in technological infrastructure.

5. **Encourage future research** on the relationship between digital transformation and health service improvement to ensure the application of best practices.

6. **Activate digital communication channels** between citizens and healthcare institutions to enhance interaction and ensure quick response to complaints and requests.

References

1. Abdullah, M. Z., Othman, A. K., Hamzah, M. I., Anuar, A., Tobi, S. N. M., & Solat, N. (2023). The Influence of Healthcare Service Quality on Public University Students' Satisfaction and Behavioural Intention: Moderating Role of Trust. *Journal of Health Management, 25*(3), 489-498 .

2. Abuosi, A. A., & Atinga, R. A. (2013). Service quality in healthcare institutions: establishing the gaps for policy action. *International journal of health care quality assurance, 26*(5), 481-492 .

3. Al-Tell, M. (2024). *IMPACT OF ELECTRONIC MANAGEMENT SYSTEM ON THE EMPLOYEE'S PERFORMANCE OF PRIMARY HEALTH CARE, A CROSS-SECTIONAL STUDY, IN NORTHERN WEST BANK, PALESTINE.* Faculty of Graduate Studies, An Najah National University .

4. Al Shobaki, M. J., Naser, S. S. A., Amuna, Y. M. A &,.El Talla, S. A. (2017). Impact of electronic human resources management on the development of electronic educational services in the universities. *International Journal of Engineering and Information Systems, 1*(1), 1-19 .

5. Ali salah, a. (2022). Role of Electronic Management in Achieving Competitive Advantage in Yemeni Pharmaceutical Manufacturers Sector in Presence of Intellectual Capital as A Mediating Variable. *Journal of Social Studies, 28*(2), 118-152 .

6. Alraimi, A. A., & Shelke, A. (2023). Measuring Health Services Quality: Nurses' Perceptions and the SERVPERF Scale .

7. Amora, J. T. (2021). Convergent validity assessment in PLS-SEM: A loadings-driven approach. *Data Analysis Perspectives Journal, 2*(3), 1-6 .

8. Bhuvana, M., & Vasantha, S. (2020). Rural citizen satisfaction on e-Health care services under e-Governance service delivery model during COVID 19. *International Journal of Management, 11*(9), 554-565 .

392 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

9.   Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management, 41*(2), 745-783 .

10. Dvir, R., Liu, X., Geva, N., & Vedlitz, A. (2024). The multi-dimensionality of citizen satisfaction: A conjoint experimental approach. *Public Policy and Administration*, 09520767241287615 .

11. El Khatib, M., Al Mulla, A., & Al Ketbi, W. (2022). The role of blockchain in E-governance and decision-making in project and program management. *Advances in Internet of Things, 12*(3), 88-109 .

12. Hadwich, K., Georgi, D., Tuzovic, S., Büttner, J., & Bruhn, M. (2010). Perceived quality of e-health services: A conceptual scale development of e-health service quality based on the C-OAR-SE approach. *International Journal of Pharmaceutical and Healthcare Marketing, 4*(2), 112-136 .

13. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science, 43*, 115-135 .

14. Hilkenmeier, F., Bohndick, C., Bohndick, T., & Hilkenmeier, J. (2020). Assessing distinctiveness in multidimensional instruments without access to raw data–a manifest Fornell-Larcker criterion. *Frontiers in psychology, 11*, 223 .

15. Hochstetter, J., Vásquez, F., Diéguez, M., Bustamante, A., & Arango-López, J. (2023). Transparency and E-government in electronic public procurement as sustainable development. *Sustainability, 15*(5), 4672 .

16. Itumalla, R., Acharyulu, G., & Shekhar, B. R. (2014 .(Development of hospitalqual: a service quality scale for measuring in-patient services in hospital. *Operations and Supply Chain Management: An International Journal, 7*(2), 54-63 .

17. Jiang, W. (2023). Enhancing Operational Efficiency in E-Commerce Through Artificial Intelligence and Information Management Integration. *Revue d'Intelligence Artificielle, 37*(6 .(

18. Khachan, L. (2022). *e-Managers: Out of Sight, But still in Mind-A New Era of Management.* Paper presented at the Academy of Management Proceedings.

19. Khoirunnisa, S., & Ramadhika, A. (2024). Pengaruh Kualitas Pelayanan Kesehatan terhadap Kepuasan Pasien di Rumah Sakit Umum Bina Sehat. *AKADEMIK: Jurnal Mahasiswa Ekonomi & Bisnis, 4*(2), 727-735 .

20. Kitapci, O., Akdogan, C., & Dortyol, İ. T. (2014). The impact of service quality dimensions on patient satisfaction, repurchase intentions and word-of-mouth communication in the public healthcare industry. *Procedia-Social and Behavioral Sciences, 148*, 161-169 .

21. Kurti, S., & Kina, K. (2024). Citizen Satisfaction's Determinants with the Integrated Public Services Quality Provided by One-Stop-Shop. A case from a Western Balkan Country. *Public Policy and Administration, 23*(3), 369-381 .

22. Lamsal, B. P., & Gupta, A. K. (2022). Citizen satisfaction with public Service :What factors drive? *Policy & Governance Review, 6*(1), 78-89 .

23. O'brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & quantity, 41*, 673-690 .

24. Ramayah, T., Cheah, J., Chuah, F., Ting, H., & Memon, M. A. (2018). Partial least squares structural equation modeling (PLS-SEM) using smartPLS 3.0. *An updated guide and practical guide to statistical analysis*, 967-978 .

393 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem

25. Rasoolimanesh, S. M. (2022). Discriminant validity assessment in PLS-SEM: A comprehensive composite-based approach. *Data Analysis Perspectives Journal, 3*(2), 1-8 .

26. Seresht, H. R., Fayyazi, M., & Asl, N. S. (2008). E-management: Barriers and challenges in Iran. *E-ower Kraklead, 2*(3), 1-11 .

27. Singh, A. (2022). HEALTHCARE SERVICE QUALITY-A REVIEW OF LITERATURE .

28. Van de Walle, S., & Van Ryzin, G. G. (2011). The order of questions in a survey on citizen satisfaction with public services: Lessons from a split-ballot experiment. *Public Administration, 89*(4), 1436-1450 .

29. Vilkaite-Vaitone, N., & Povilaitiene, K. (20 .(22E-management as a game changer in local public administration. *Economies, 10*(8), 180 .

30. Wang, W.-P., Huang, M.-L., & Ou, Y.-C. (2024). An Approach to Evaluate Healthcare Service Quality by Incorporating Linguistic Assessment and Computing .

31. Yacine, G ,.Djamel, N., & Adel, G. (2024). Stages of A Sound Transition from Traditional Management to Electronic Management. *Economic Sciences, 20*(1), 64-72 .

32. Zhang, H. (2022). Structural equation modeling *Models and methods for management science* (pp. 363-381): Springer.

394 – www.imcra.az.org, | Issue 8, Vol. 8, 2025
The Impact of Applying E- Management in Improvingthe Quality of Health Services in Algerian Public Hospital Institutions: A Case Study of The Public Hospital Ahmed Ben Bella Khenchela
Telil Asma
Hecini Ibtissem