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The impact of information technology governance on the quality of e-health services: the mediating role of digital human competencies in public hospitals

Dr. Dilmi Nadjat, PhD Researcher in Business Administration, Department of Management Sciences, Faculty of Economics, Commercial and Management Sciences, University of Tipaza (Algeria),
dilmi.nadjet@univ-tipaza.dz

Dr. Benzaoucha Fethi, PhD Researcher in Human Resource Management (HRM), Department of Management Sciences, Faculty of Economics, Commercial and Management Sciences, University of Tipaza (Algeria), benzaoucha.fethi@univ-tipaza.dz

Dr. Besseklal Tayyib, PhD Researcher in Urban Sociology, Department of Sociology and Demography, Faculty of Sciences Sociales, university of Ammar Telidji - Laghouat (Algeria), t.besseklal@lagh-univ.dz

Corresponding Author Email: dilmi.nadjet@univ-tipaza.dz
Major: Business Administration

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Abstract :

This study aims to analyze the impact of information technology governance on the quality of e-health services in public hospitals, highlighting the mediating role of digital human competencies. It relies on the conceptual framework of IT governance and its core principles as a strategic mechanism to ensure the optimal and secure utilization of technology, thereby aligning tech infrastructure with institutional performance. Furthermore, the study addresses digital human competencies across various dimensions, emphasizing the necessity of developing them in accordance with digital transformation requirements in the healthcare sector. The findings highlight the key role of continuous training, organisationnel support, and facilitating conditions in enhancing digital readiness and empowering medical and administrative staff to effectively deploy modern health technologies. Additionally, it underscores the importance of digital leadership and organizational culture in fostering an environment conducive to digital learning. Finally, the study examines the dimensions of e-health service quality—specifically speed, reliability, responsiveness, and beneficiary satisfaction—positing that IT governance directly enhances service quality by establishing clear policies and management frameworks for both technical and human resources.

Keywords : IT Governance, E-Health Services, Digital Human Competencies, Service Quality, Public Hospitals.

JEL Classification Codes : I10, I18, M15, J24, O33

1. Introduction :

The healthcare sector is a fundamental pillar of comprehensive development and a cornerstone of national economies, where stability is directly linked to the health and well-being of citizens. Health stimulates economic growth, which in turn leads to improved healthcare services. Amid the rapid digital transformation of the modern era, e-health—encompassing electronic health records, patient portals, and telemedicine platforms—has become essential for optimizing healthcare efficiency, ensuring patient safety, and enabling innovative care delivery systems. In this context, IT governance has emerged as a critical framework designed to leverage information and communications technology to enhance care delivery, improve efficiency, foster transparency, and facilitate access to services. Adopting these governance structures is imperative to overcome systemic challenges, particularly through frameworks such as ISO/IEC

38500, which emphasizes clear accountability, responsibility distribution, and the alignment of technical strategies with organizational goals.

service quality in healthcare institutions. Rather, it relies heavily on the capacity of human resources to effectively utilize digital technologies and apply governance principles. In this regard, despite their critical role, digital human competencies remain insufficiently explored in previous literature. When healthcare personnel lack the necessary digital culture and skills to implement governance, frameworks specifically designed to enhance e-health service quality inevitably fail to achieve their intended outcomes.

1. Research Problem

The primary objective of healthcare institutions in Algeria is to attain high levels of healthcare service quality, which is evaluated through operational efficiency, information reliability, and patient satisfaction.

- **Main Research Question:**

Based on the aforementioned context, the main research question is formulated as follows:

How can IT governance in public hospitals enhance the quality of healthcare services through the mediating role of digital human competencies?

- **Sub-Questions:**

To comprehensively address the various aspects of this study, the main research question is divided into the following sub-questions:

- How do IT governance principles affect the quality of e-health services?
- How does IT governance influence digital human competencies?
- Is there a relationship between digital human competencies and healthcare service quality?
- What is the role of digital human competencies in the presence of IT governance and healthcare service quality?

1.2. Research Hypotheses

Based on the research problem, objectives, theoretical framework, and previous literature, the main hypothesis of the study is formulated as follows:

IT governance in public hospitals positively impacts healthcare service quality, and this impact is enhanced through the mediating role played by digital human competencies.

- **Sub-Hypotheses:**

- IT governance principles positively affect the quality of e-health services.
- IT governance contributes to enhancing the digital competencies of medical and administrative staff.
- There is a positive correlation between digital human competencies and healthcare service quality.
- Digital human competencies mediate the relationship between IT governance and healthcare service quality.

1.3. Significance of the Study

This study derives its significance from the growing adoption of technology and digital transformation in the healthcare sector. This shift requires ensuring the effective yet secure utilization of information technology, which directly reflects on the quality of healthcare services provided to beneficiaries.

1.4. Objectives of the Study

This study aims to achieve a set of specific objectives, outlined as follows:

- To assess the current status of IT governance in public hospitals, as well as the extent to which its principles and mechanisms are applied in managing and utilizing technological resources.
- To determine the level of digital human competencies among personnel in public hospitals, evaluating their ability to deploy digital technologies in delivering various healthcare services.
- To measure the impact of IT governance on the quality of e-health services in public hospitals.
- To examine the impact of digital human competencies on the quality of e-health services.
- To provide a set of practical recommendations and proposals aimed at bolstering IT governance, developing digital human competencies, and improving the quality of healthcare services.

2. Conceptual Framework of IT Governance

IT governance is defined as: "the distribution of IT decision-making rights and accountabilities among various stakeholders within the organization, outlining the procedures and mechanisms necessary to make and monitor strategic decisions (Peterson, 2004) According to Weill and Ross, it refers to a structured mechanism for assigning decision-making authority and responsibility to foster beneficial technology-related behaviors across the organization (Otarkhani, Shokouhyar, & Salehi Pour, Analyzing the impact of governance of enterprise IT on hospital performance: Tehran's (Iran) hospitals – A case study, 2017) In healthcare settings, governance serves as an overarching framework of leadership, organizational structures, and processes that ensures hospital IT systems directly align with and support strategic medical objectives. Additionally, it represents an organizational capability to guide the formulation and execution of IT strategies, steering the institution toward a sustainable competitive advantage. Ultimately, sound digital health governance seeks to align policies and stakeholders, ensuring the delivery of safe, high-quality care while safeguarding patient data privacy. (Marcelo., et al., 2018), Governance frameworks serve as the foundational backbone for organizations implementing IT governance, ensuring that technology Investments strategically align with organizational objectives to generate value and foster internal stability. Organizations rely on various frameworks, most notably COBIT, to define target maturity levels and establish strategic roadmaps. Furthermore, to structure and evaluate the technological environment, institutions utilize

the ISO/IEC 38500 standard—the premier benchmark for corporate governance of information technology (Alharbi, Sabra, Alharbe, & Almajed, 2022) .

The Six Principles of Governance: This standard sets out six principles that aim to provide guidelines for managers on how to evaluate, direct and monitor the use of technology investments in the right direction and are as follows:

- **Responsibility:** This principle states that the parties responsible for IT decisions must be clearly identified and understood. This requires distributing decision-making rights and responsibilities among stakeholders to ensure that desired behaviors are encouraged and accountability is achieved (Bonney, 2011). This requires individuals to accept the responsibilities provided.
- **Strategy:** This principle stipulates the strategic alignment that takes place between business plans and IT objectives (Shokouhyar, Zarrin, & Shokoohyar, 2020). In this context, technology governance must ensure that technology systems support the hospital's current and future strategy and contribute to achieving its objectives.
- **Acquisition:** In order to reduce the risks related to wasted money and ensure that technological investments add tangible value and go beyond being merely the acquisition of hardware and software and avoid unnecessary duplication of systems purchases, the principle states that ensuring the procurement or development of technical solutions is based on a careful analysis of needs and in alignment with the organization's infrastructure. (Shokouhyar, Zarrin, & Shokoohyar, 2020)
- **Performance:** According to this principle, the organization ensures that technology provides a level of performance specifically designed to suit its needs (Krey, Harriehausen, Knoll, & Furnell). It focuses on monitoring the performance of information technology systems to ensure the provision of healthcare services of the required quality. This requires evaluating the effectiveness of the systems' performance in facilitating medical care and administrative work. (Jarva, 2023)

IT governance plays a pivotal role in enhancing e-health service quality by ensuring the effective and structured deployment of technology in alignment with the strategic objectives of healthcare institutions. This is achieved through establishing clear frameworks for accountability and decision-making authority, prioritizing information security and risk management, and continuously monitoring digital system performance—collectively enabling hospitals to deliver more reliable and responsive e-services to beneficiaries.

Furthermore, effective governance ensures that technological investments are directed toward priority healthcare goals, thereby mitigating system interoperability challenges and ensuring the continuity of digital services. Consequently, it is hypothesized that the effective implementation of IT governance principles positively correlates with improvements across key e-health service quality dimensions, notably reliability, responsiveness, security, and usability.

3.Digital Human Competencies: Digital competence in the healthcare sector is no longer merely an isolated technical skill; rather, it has become a fundamental prerequisite for ensuring patient safety and driving successful digital transformation. Conceptualized as an integrated framework combining cognitive, practical, and behavioral elements, digital human competencies act as a key mediator that converts technological infrastructure into tangible service quality. Ultimately, technological deployment alone cannot guarantee high quality unless healthcare personnel possess the necessary capabilities to effectively utilize these tools (Binsar, Mursitama, Hamsal, & Rahim, 2024).

In this context, these competencies serve as a partial mediator in the relationship between technology deployment and service quality. Key dimensions include technological knowledge, adaptability, and ethical awareness regarding data security (Judijanto, 2026). Furthermore, higher proficiency in these competencies is significantly associated with factors such as advanced education, extensive work experience, and sustained administrative support (Erfani, et al., 2025).

1.3. Digital Competence :

Digital competence is defined as an integrated set of cognitive, technical, ethical, social, and emotional skills that enable individuals to utilize digital technologies safely, critically, and creatively (Aktı Aslan, Ayaz, & Çekmez, 2026). In the healthcare context, digital health competence refers to the combination of knowledge, attitudes, and skills required to effectively manage and apply digital technologies to enhance healthcare delivery (Erfani, et al., 2025).

2.3. Digital Health Competence

Digital health competence is defined as a holistic capability that integrates knowledge, technical skills, attitudes, and ethical behavior in utilizing digital technology to deliver safe, high-quality, and patient-centered care (Jarva, 2023). It encompasses the essential competencies required to effectively manage and leverage digital tools to enhance overall healthcare delivery (Erfani, et al., 2025).

In healthcare settings, digital competence is defined as an integrated combination of knowledge, skills, and attitudes that enables practitioners—including physicians, nurses, and administrative staff—to effectively and confidently use technology to optimize healthcare delivery and patient outcomes (Yoe, 2024)., it also encompasses the clinical staff's ability to communicate and interact with patients across various digital platforms, such as telemedicine, in a manner grounded in mutual respect and equity (Jarva, 2023).

3.3. Dimensions of digital efficiency: The dimensions of digital efficiency are as follows:

- **Human-centered competence:** This dimension is classified as a social competence according to a study (Mainz, 2024) , and emphasizes that technology is a means, not an end. This competence includes rational digital interaction, which means the competence of medical staff and the skills to communicate and interact with patients through various digital means (such as remote consultations) in a way based on mutual respect and equality (Jarva, 2023) Establishing the

concept of patient self-empowerment by encouraging patients to self-manage their health and guiding them to access reliable health information via digital platforms.

• **Technical and IT skills:** In the health sector, it refers to the technical capabilities and applied skills needed to use digital tools and platforms effectively and confidently to enhance the quality of care (Binsar, Mursitama, Hamsal, & Rahim, 2024). This dimension represents the backbone of operational processes and is included within the framework of technological competencies. This dimension branches into three basic levels of competence:

- **Digital culture:** represented by basic computer competencies such as operating hardware, software, and operating systems.

- **Information culture:** which requires skills to search for, analyze and process accurate data rather than simply transfer it.

- **Media literacy:** This is necessary to analyze and process information presented in various forms such as infographics and digital x-rays (Binsar, Mursitama, Hamsal, & Rahim, 2024). These skills are of great importance in managing electronic health records and telemedicine technologies, as they enable doctors to improve the quality of services provided and reduce medical errors by up to 80% (Harfouche, Kaouther, & Berarma, 2025).

• **Commitment to ethics and data:** This dimension constitutes an essential component of the methodological and technical competencies that ensure the security and integrity of health information (Mainz, 2024), as it stipulates the protection of data privacy represented by the obligation of medical and administrative staff to ensure the security and complete confidentiality of patient data during its processing (Jarva, 2023), legal and ethical awareness related to understanding the legislation regulating digital medical practice, and the ability to make correct ethical decisions when using new technological solutions Taking into account the principles of justice and independence for the patient.

Human digital competencies represent a determining factor in determining the level of actual benefit from technology within health institutions, as it is not enough to provide digital systems and platforms without human resources having the ability to use them correctly and effectively. Medical and administrative staff's possession of digital skills helps in the proper use of electronic health systems, entering and processing information accurately, accessing data in a timely manner, and dealing with technical problems more effectively. This is reflected in the speed of service delivery, accuracy, reliability, information security, as well as improved beneficiary experience. Therefore, the higher the level of digital competencies among human resources, the greater the health institution's ability to employ technology to support the quality of e-health services.

4. Competency development:

1.4. The role of continuous training and organizational support in raising digital readiness: Continuous training of medical and administrative staff in the field of technology is the basis for raising the level of digital readiness of health staff and is directly reflected in improving performance. As a capacity building tool, investment in training and development programs is crucial to equip health professionals with the skills necessary to use new technologies effectively (Marcelo, et al., 2018). Conversely, lack of training leads to poor digital competence in solving routine technical problems and data security, which constitutes an obstacle to technology acceptance (Alotaibi, Brown Wilson, & Traynor, 2025). Therefore, training should go beyond focusing on technical skills only, but should include communication skills and the use of digital systems in interacting with patients.

2.4. Organizational support and facilitating conditions: Organizational support plays a fundamental role in transforming human resources into an educated force capable of adapting to technological developments. Leaders play their role in supporting employees and encouraging them to learn the latest technologies and employ them to serve their tasks and improve work methods. Providing a clear supporting and administrative infrastructure contributes to enhancing the acceptance and integration of the system in the field diagnostic process (Mainda & Sulle, 2024) Studies confirm that hospital policies and the provision of facilities and technical means support the adoption of health information management systems (Febriyanti, Widianingsih, Sumaryana, & Buchari, 2023). Continuous technical support and the presence of specialized teams to troubleshoot and repair faults reduce stress and feelings of inadequacy among medical staff, which reduces resistance to change (Alotaibi, Brown Wilson, & Traynor, 2025).

5. Quality of e-health services: The concept of e-Health represents the digital and technological transformation in providing medical care and facilitating access to it. However, the true success of this transformation is not limited to simply providing digital applications and services, but rather depends primarily on "the quality of eHealth services" provided. Quality constitutes the dividing standard for ensuring patient safety, data accuracy, and diagnostic reliability, which enhances beneficiary confidence and achieves the required efficiency and excellence in the healthcare sector.

1.5. E-health: E-health aims to achieve a radical transformation in the healthcare sector by removing geographical and time barriers for patients, and reducing medical errors to ensure a safe healthcare environment. E-health is defined as the transfer of resources and healthcare via electronic means according to the World Health Organization's definition (Organization, 2021). It includes the use of digital devices capable of creating, storing, retrieving, and transmitting data for the purpose of improving patient safety and the quality of care provided (Kuo & Chen, 2020).

E-health is a comprehensive conceptual framework that includes telemedicine, electronic health records, and important decision support systems, all of which aim to facilitate digital interaction between patients and physicians (Bonney, 2011). This system also contributes to the shift from traditional paper-based practices to an integrated digital environment that contributes to reducing medical errors (by 50% to 80%) and promoting "patient-centered" care (Kuo & Chen, 2020).

2.5. The concept of digital service quality: Digital service quality is defined as the end user's overall assessment of the benefit and effectiveness he obtains through electronic channels. It goes beyond technical performance to include the extent to which digital platforms meet users' expectations and facilitate their access to services (Ighomereho, Ojo, Omoyele, & Olabode, 2022). In the health context, quality focuses on providing effective, safe, reliable, and individual-centered care through technological means. (Basbous & Saad, 2024). The SERVQUAL model, developed by Parasuraman and colleagues (1988), is the most widely used tool for measuring service quality by assessing the gap between customer expectations and their perception of actual performance (Ighomereho, Ojo, Omoyele, & Olabode, 2022). Although the model was originally designed for traditional services, it has been used and adapted in health and technology studies as a fundamental basis for understanding digital service quality.

3.5. Dimensions of Service Quality: Digital quality in the health sector is based on five main dimensions from the perspective of the dimensions of the SERVQUAL model:

- **Reliability:** Accuracy and consistency are represented by the digital platform's ability to perform the promised service correctly the first time and without errors (Ighomereho, Ojo, Omoyele, & Olabode, 2022), which leads to transparency of information and accuracy of medical records, ensuring that websites and applications operate efficiently around the clock, and adherence to appointments by providing services on time, such as timing appointment reservations, providing test results or quickly processing inquiries (Ighomereho, Ojo, Omoyele, & Olabode, 2022).
- **Response:** This dimension reflects how quickly the management of health institutions responds to patients' requests and needs and provides a fast service, and the speed of interaction is represented in the speed with which the site deals with patients' requests and solves technical registration problems (Kitsios, Stefanakakis, Kamariotou, & Dermentzoglou, 2023).
- **Immediate support:** This involves providing quick feedback via communication channels (such as email or text messages) to ensure that the user does not feel frustrated when a digital transaction fails (Harfouche, Kaouther, & Berarma, 2025).
- **Security and Trust:** This dimension is related to building user trust and reducing the risks of digital transactions. It relates to the knowledge and skills demonstrated by digital systems and their supporting staff to instill trust in patients (Kitsios, Stefanakakis, Kamariotou, & Dermentzoglou, 2023) and the system's ability to protect sensitive health data from breaches and ensure the confidentiality of financial and technical transactions (Ighomereho, Ojo, Omoyele, & Olabode, 2022).
- **Empathy:** It is considered the most important dimension of the study because it reflects the system's ability to understand individual users' needs via digital means by providing distinct individual attention tailored to each patient's needs to understand their own needs, ensuring easy access to digital services for vulnerable groups (such as the elderly) (Harfouche, Kaouther, & Berarma, 2025). and the system's ability to operate in understandable language and provide flexible options that reflect the organization's concern for the patient's best interests at the top of its priorities (Ko & Chou, 2020), such as answering frequently asked questions and interacting via social media.
- **Tangible Aspects:** The tangible aspects of the digital environment are transformed from physical to visual and technical, through the site's appearance and attractive design that showcases the visual aesthetics of the digital platform, ease of navigation, and organization of the information structure in a way that attracts the user (Kitsios, Stefanakakis, Kamariotou, & Dermentzoglou, 2023). It also provides the latest technical devices and equipment that facilitate service delivery, and a clean professional appearance for employees who appear via remote guidance services (Harfouche, Kaouther, & Berarma, 2025).

6. The relationship between study variables:

6.1. Governance and Human Resources: The relationship between governance and the digital efficiency of human resources is complementary and reciprocal. Governance serves as an organizational framework that ensures human capacity building, while an efficient human resource represents the "backbone" that ensures the successful implementation of governance and the achievement of its strategic objectives. It appears through:

- **Governance as a strategic framework for capacity building:** Good governance for digital health aims to strengthen the capabilities and skills necessary for decision-makers to expand the scope of digital technologies and encourage innovation. Governance principles (such as accountability, transparency, and responsiveness) create the appropriate conditions for coordination between stakeholder efforts and the implementation of policies that ensure that medical and administrative staff possess the knowledge and skills necessary to handle electronic records and telemedicine. (Ricciardi, 2019) Governance also contributes to making the organizational environment a stimulating environment by integrating human competencies into the basic "enablers" to achieve strategic goals (Marcelo., et al., 2018).
- **Organizational support resulting from governance frameworks is the primary factor that determines the level of digital competence of administrative medical staff:** It has been found that employees who work in environments that fully implement governance have continuous training opportunities, which makes them possess much higher levels of competence (Jarva, 2023). Implementing governance requires senior management to allocate significant budgets for training and capacity building programs as a strategic priority, which directly affects improving the quality of health care (Marcelo., et al., 2018).
- **The role of digital leadership as a possible environment for learning digitization and as a driver of technical literacy:** The role of digital leadership is highlighted in transforming medical and administrative staff into an efficient human resource, so it is considered the key to qualifying a digitally educated workforce, which is known as digital readiness.

Leaders charged with digitization work as key enablers of transformation management. By motivating medical and administrative staff to exploit the full potential of ICT by enhancing understanding and skills, governance requires leaders with the ability to create an organizational culture that supports continuous learning to address the challenges of "digital illiteracy," which is a major obstacle to implementing digital initiatives (Binsar, Mursitama, Hamsal, & Rahim, 2024).

• **The human dimension as one of the principles of good governance:** The global international standard (ISO/IEC 38500) highlights that "human behavior" as one of the six essential principles of governance, focusing on the need to align policies and decisions related to information technology with the needs of medical and administrative staff and taking into account the continuous development of their skills. The success of implementing governance depends on the presence of skilled and ethically responsible human resources capable of transforming digital systems into tangible outputs. Governance mechanisms also contribute to precisely defining roles and responsibilities, which raises the level of accountability and professional commitment among executives. (Shokouhyar, Zarrin, & Shokoohyar, 2020). Improving employees' skills and changing their psychological attitudes towards technology contributes to reducing human errors and increasing response speed. The human dimension is also a crucial factor in achieving the legitimacy and long-term sustainability of digital systems (Harfouche, Kaouter, & Berarma, 2025).

2.7. Governance and service quality: The impact of governance on service quality and technology alignment with performance: Health Information Technology Governance (HIT Governance) is not just a technology choice, but an imperative necessity that ensures that digital investments are transformed into tangible results that are reflected in the quality of healthcare. This governance plays a key role in aligning technology with corporate objectives, ensuring the sustainability and effectiveness of services.

• **The Impact of IT Governance on E-Health Service Quality**

IT governance exerts a direct, significant, and positive impact on the quality of e-health services, serving as a strategic framework that converts technological investments into tangible outcomes that enhance hospital performance and patient safety. Effective IT governance substantially improves healthcare delivery and patient care by reducing medical errors and strengthening communication and coordination among medical and administrative personnel. Consequently, this facilitates seamless information exchange, minimizes care-transition gaps, and ensures rapid, accurate access to patient data (Chumba, Waema, & Ochieng, 2025). Furthermore, well-governed systems guarantee the precise and secure management of electronic health records, thereby facilitating informed clinical decision-making. In addition, IT governance elevates patient safety by strictly regulating care protocols and pharmaceutical administration procedures, ensuring the highly accurate and timely delivery of treatments (Makame & Sulle, 2024). Conversely, the absence of robust governance significantly increases the risk of digital project failures, with literature indicating that up to 70% of health IT systems either fail or remain underutilized due to weak governance structures (Chumba, Waema, & Ochieng, 2025).

• **IT governance contributes to the provision of telehealth and improves patients' access to services available on platforms and applications:** such as booking appointments and viewing laboratory test results via electronic portals, which facilitates patients' access to services and establishes the principle of patient-centered care (Makame & Sulle, 2024). These frameworks also ensure the existence of clear mechanisms for accountability and transparency in health processes which raises the level of stakeholder confidence in the digital system.

• **IT governance frameworks form the basis for protecting patients' sensitive information and keeping their data private from being compromised:** they are key to building digital trust and ensuring compliance with legal and ethical legislation (Alotaibi, Brown Wilson, & Traynor, 2025).

7.3. Human Resources, Service Quality, and the Mediating Role of Digital Competencies

Digital competencies among human resources constitute the foundational backbone that translates rigid governance structures into tangible service quality. While governance provides policies, procedures, and technological infrastructure, human digital competence drives its operational efficacy. Information systems governed by rigorous standards cannot achieve their intended outcomes in isolation; rather, digital competencies act as a vital mediating mechanism connecting technological resources to service performance. Competent medical and administrative personnel are better equipped to leverage these systems, minimize documentation errors, and support critical clinical decision-making, thereby transforming "digitization policies" into "operational excellence" (Farizal, Adam, Andriana, & Hadjri, 2025).

Furthermore, digital competence empowers employees to independently navigate technical challenges, ensuring service continuity. It serves as an engine for cultivating a mediating "digital culture" that secures sustainable digital transformation. When healthcare personnel possess advanced digital capabilities, they become more receptive to innovation and collaborative practices, ultimately converting "governance mandates" into "organizational behavior" that fosters excellence in patient care (Rumambi, Lumintang, Pandowo, & Trang, 2026). This digital culture functions as a bridge aligning individual skills with the strategic objectives of the hospital.

Human resource efficiency plays a fundamental role in the actual application of governance principles to tangible dimensions in service quality according to the SERVQUAL model (Harfouche, Kaouter, & Berarma, 2025). Although governance provides the necessary regulatory frameworks, digital services, and communication platforms, this cannot be achieved without the human resource possessing digital skills and the ability to employ them efficiently, which is reflected in service quality and is demonstrated by enhancing the two dimensions of "empathy." and responsiveness (Harfouche, Kaouter, & Berarma, 2025), and human efficiency ensures the accuracy and reliability of medical records, transforming the "resource management" policy into a true "patient safety" (Farizal, Adam, Andriana, & Hadjri, 2025) by improving

diagnostic accuracy and reducing medical errors, which is directly reflected in the quality of service. The human resource also plays an important role in utilizing and processing data to extract accurate parameters of value that support medical decision-making. This is based on governance as a framework to ensure the quality of information (Binsar, Mursitama, Hamsal, & Rahim, 2024).

Service quality is attained when employees feel accountable for healthcare outcomes; in this regard, governance clarifies roles and responsibilities, thereby motivating personnel to deliver optimal performance (Auerbach, 2021). Furthermore, actively involving patients in digital processes—such as feedback and evaluation mechanisms—transforms governance into a participatory practice aimed at continuously enhancing the patient experience.

Based on the aforementioned interrelationships, digital human competencies can be conceptualized as a mediating variable that explains how the impact of IT governance is transmitted to e-health service quality. While an effective IT governance framework provides the requisite policies, procedures, training, and organizational support for digital system adoption, its ultimate effect on service quality is not fully realized without human resources capable of absorbing and efficiently deploying technology. When medical and administrative personnel possess adequate digital competencies, they become better positioned to leverage electronic health systems, enhance information accuracy and flow, respond to beneficiaries' needs, and maintain data security. Consequently, digital human competencies function as a critical link between IT governance and e-health service quality, reinforcing the hypothesis that these competencies play a mediating role in the relationship between the two variables.

9. Conclusion

A strong positive relationship exists between IT governance and hospital performance, as governance establishes the requisite organizational and technological environment. However, technology alone cannot guarantee quality unless operationalized by qualified personnel. This highlights the pivotal mediating role of digital competencies: while IT governance enhances the skills of medical and administrative staff, these competent professionals, in turn, translate technological potential into high-quality healthcare services.

8. Recommendations

Based on the study findings, the following actionable recommendations are proposed:

- Design a clear institutional framework for IT governance tailored to public hospitals.
- Implement continuous digital training programs for both medical and administrative personnel.
- Enhance organizational support and facilitating conditions to drive the effective adoption of electronic health systems.
- Foster digital leadership and promote an organizational culture that accelerates digital transformation.
- Align e-health service quality metrics directly with the digital competence levels of healthcare personnel.

9. Future Research Directions

To build upon the findings of this study, several avenues for future research are suggested:

- Investigate differences in digital competence levels across various medical and administrative cadres within public hospitals.
- Conduct empirical studies testing the mediating role of digital competencies using advanced statistical modeling (e.g., Structural Equation Modeling).
- Perform comparative studies benchmarked across public and private hospital settings.
- Incorporate emerging variables—such as cybersecurity posture, artificial intelligence integration, and the digital patient experience—into future structural models.

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