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The Role of Health Information System, Service Innovation, And Data Governance in Enhancing Hospital Quality Standards in University of Perpetual Help Dr. Jose G. Tamayo Medical Center

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Abstract

Hospitals adopt advanced systems to improve efficiency, service delivery, and quality of care. Health Information Systems, service innovation, and data governance are important factors in modern healthcare, as they support accurate data management, and ensure patient information security. Despite many international studies, there is limited research in the Philippine context on how these factors collectively influence hospital quality standards. Thus, this study aimed to determine the significant correlation between health information systems, service innovation, data governance, and hospital quality standards. This study used a descriptive-correlational design and simple random sampling to select 204 employees of University of Perpetual Help Dr. Jose G. Tamayo Medical Center, with data collected through a self-made questionnaire and analyzed using weighted mean and ranking, Pearson-r correlation, and stepwise multiple regression. Results showed that all variables were rated very high (3.38–3.53) and had significant relationships ($p = 0.000$). Regression analysis indicated that the predictors significantly influence hospital quality standards, explaining 72.3% of its variance ($R^2 = 0.723$, $F = 85.530$, $p = 0.000$), with data governance as the strongest predictor ($\beta = 0.318$, $p < 0.01$), followed by patient convenience and new services. The findings suggest that strengthening data governance, improving service innovation, and enhancing health information systems contribute to better hospital quality standards, and hospitals are encouraged to sustain strategies that support digital systems, innovative services, and strong data governance.

Keywords: Data Governance, Health Information System, Hospital Quality Standards, Service Innovation

1. Introduction

The healthcare industry is undergoing rapid digital transformation as hospitals strive to enhance efficiency, safety, and quality of care. Health Information Systems have become essential in modern healthcare, enabling effective management of clinical data, better coordination, and improved decision-making (Raimo et al., 2023; Epizitone et al., 2023). Digital health systems streamline processes, improve transparency, and support evidence-based practices (Ibrahim et al., 2023). Globally, health information systems, service innovation, and data governance are recognized as key drivers of hospital quality,

supporting patient-centered care, operational efficiency, and innovative healthcare delivery (Nayak et al., 2025; Park et al., 2021).

Service innovation enhances hospital performance and patient satisfaction by introducing improved services that respond to changing needs (Guarcello & de Vargas, 2020; Willie, 2024). At the same time, strong data governance ensures data integrity, privacy, and security, which are critical for quality healthcare (Ngesimani et al., 2022). Effective data governance reduces errors, supports decision-making, and protects patient information, contributing to better outcomes and compliance with standards (Deghati, 2024; Oktaviana et al., 2025). These factors reflect the theory where this study is anchored, the Donabedian Model of Quality of Care, where structure (systems and governance), process (service delivery and innovation), and outcome (hospital quality) are interconnected.

Despite extensive international studies, there is limited empirical research in the Philippine healthcare context. Most studies examine health information systems, service innovation, and data governance separately, or are conducted in developed settings, limiting their relevance to local hospitals. There is also a lack of studies that explore how these factors collectively influence hospital quality outcomes in private medical institutions.

To address this gap, this study examines the influence of health information systems, service innovation, and data governance on hospital quality outcomes at University of Perpetual Help Dr. Jose G. Tamayo Medical Center. It aims to provide evidence on how digital systems, governance practices, and innovative services contribute to improving healthcare quality, operational efficiency, and patient-centered care in a Philippine hospital setting.

2. Methods

This study used a descriptive-correlational research design to examine the relationship between health information systems, service innovation, and data governance. This approach gathered information without manipulating variables, aiming to describe the current condition and determine relationships among the variables.

The primary data for this study were the employees of University of Perpetual Help Dr. Jose G. Tamayo Medical Center. Only the empirical data that was gathered from these respondents was subjected to statistical treatment and analysis.

The researcher used a self-made questionnaire to collect primary data, divided into four parts covering health information system, service innovation, data governance, and hospital quality standards. The instrument was reviewed by the research adviser and validated by experts in health informatics, hospital management, and research methodology to ensure clarity, relevance, and suitability, with revisions made based on their feedback. Reliability was tested using Cronbach's Alpha through a pilot test with 30 respondents not included in the main study, yielding high coefficients (HIS 0.951, service innovation 0.946, data governance 0.962, hospital quality standards 0.950), all above the acceptable standard of 0.70, confirming that the instrument is reliable for data collection.

The researcher secured approval from the graduate school dean. With the adviser's guidance, the questionnaires were prepared, and consent forms were first approved by the hospital's human resources department. The questionnaires were then distributed to respondents, and the collected data were organized, tallied, and analyzed.

After the respondents completed the survey questionnaire, the data were organized and analyzed using statistical tools. Weighted mean and ranking determined the levels of health information system, service

innovation, and data governance, Pearson r examined their relationships, and stepwise multiple regression analysis identified their predictive power.

1. Results and Discussions

Table 1 Summary Table for the Level of Health Information System

Indicator	Weighted Mean	Verbal Interpretation	Rank
System use	3.42	Very High	1
Ease of use	3.35	Very High	2
Overall Weighted Mean	3.38	Very High	

Table 1 shows the summary table for the level of health information system with an average weighted mean of 3.38 verbally interpreted as "Very High". This reveals a very high level of health information system. The study reveals that health information systems are used consistently to support quality monitoring activities. They document and track quality-related data, monitor compliance with internal quality indicators, integrate into routine quality management processes, and provide timely access to data needed for quality evaluation. These systems are easy to navigate during quality-related tasks because their functions are clear and understandable. Data entry processes remain straightforward and efficient. System features support the efficient completion of quality monitoring activities. The system also reduces complexity in quality documentation processes.

Specifically, the level of the health information system is "Very High" with an overall weighted mean of 3.38. The level of health information system is in "Very High" levels in all the indicators: Indicator 1 - System use with weighted mean of 3.42, verbally interpreted as "Very High" (Rank 1) and Indicator 2 - Ease of use with a weighted mean of 3.35, with a verbal interpretation of "Very High" (rank 2).

The overall result affirms the studies of Winter et al. (2023), who explained that health information systems support decision-making by providing timely and accurate data for hospital operations. It also supports Sanjuluca et al. (2022), which found that these systems improve patient care and administrative efficiency through better information management. In addition, Tiga (2025) emphasized that health information systems ensure data accuracy, accessibility, and security, which improves healthcare delivery. The very high overall level in the result shows that the system is effectively used and easy to use, which agrees with the idea that proper use of health information systems improves hospital performance and quality of care.

Table 2 Summary Table for the Level of Service Innovation

Indicator	Weighted Mean	Verbal Interpretation	Rank
Patient convenience	3.40	Very High	1
New services offered	3.38	Very High	2
Overall Weighted Mean	3.39	Very High	

Table 2 presents the summary table for the level of service innovation with an average weighted mean of 3.39 verbally interpreted as "Very High". This reveals a very high level of service innovation. The study reveals that service processes are designed to reduce patient waiting time. As a result, new service approaches improve ease of access to hospital services. Service delivery processes support smoother patient flow. Similarly, innovations in services simplify patient procedures. Therefore, hospital services are adjusted to better meet patient needs. To address these needs, the hospital introduces new services.

These services are developed to support quality improvement goals. Accordingly, service offerings are updated to align with current healthcare standards. New services enhance the hospital's ability to meet quality requirements.The hospital adopts innovative service approaches to improve care.

Specifically, the level of the service innovation is "Very High" with an overall weighted mean of 3.39. The level of service innovation is in "Very High" levels in all the indicators: Indicator 1 - patient convenience with weighted mean of 3.40, verbally interpreted as "Very High" (Rank 1) and Indicator 2 - New services offered with a weighted mean of 3.38, with a verbal interpretation of "Very High" (rank 2).

The overall result on service innovation validates the studies of Yeboah et al. (2024), who defined service innovation as a way to improve patient-centered care and service quality. It also supports Tulane University (2024), which highlighted that service innovation improves efficiency and access to care. Likewise, Kosiol et al. (2024) emphasized that innovation in healthcare requires strong processes and leadership to improve service delivery. The very high level of service innovation in the result shows that hospitals are improving both patient convenience and service offerings, which agrees with these studies and shows strong alignment with existing literature.

Table 3 Summary Table for the Level of Data Governance

Indicator	Weighted Mean	Verbal Interpretation	Rank
Data privacy policy	3.53	Very High	1.5
Staff training on data protection	3.53	Very High	1.5
Overall Weighted Mean	3.53	Very High	

Table 3 shows the summary table for the level of data governance with an average weighted mean of 3.53 verbally interpreted as "Very High". This reveals a very high level of data governance. The study reveals that the clear data privacy policies guide the handling of patient information and align with legal and regulatory requirements. These policies are integrated into daily data management practices and support the protection of sensitive health information. Compliance with data privacy policies is monitored. Training programs cover proper handling of sensitive data and support awareness of data privacy responsibilities. Data protection training aligns with current policies and regulations. Staff are informed about proper data storage and access procedures. Data protection training supports safe use of information systems.

Specifically, the level of the data governance is "Very High" with an overall weighted mean of 3.53. The level of data governance is in "Very High" levels in all the indicators: Indicator 1 - data privacy policy and Indicator 2 - staff training on data protection both with a weighted mean of 3.53, with a verbal interpretation of "Very High" (rank 1.5).

The findings on data governance affirms the study of Gisma (2025), which explained that data governance provides a framework that ensures accurate, secure, and responsible use of health data. It also supports Octaviana et al. (2025), who stated that strong data governance improves patient safety, supports compliance, and enhances hospital performance. In addition, Forstel et al. (2024) emphasized that high-quality data is important for effective decision-making and hospital efficiency. The very high level of data governance in the result shows that hospitals are effectively managing data through policies and training, which is consistent with these studies.

Table 4 Summary Table for the Level of Hospital Quality Standards

Indicator	Weighted Mean	Verbal Interpretation	Rank
Patient satisfaction	3.47	Very High	1
Operational efficiency	3.46	Very High	2
Overall Weighted Mean	3.46	Very High	

Table 4 shows the summary table for the level of hospital quality standards with an average weighted mean of 3.46 verbally interpreted as "Very High". This reveals a very high level of hospital quality standards. The study reveals that hospital services are designed to respond to patient needs efficiently, as staff provide courteous and patient-centered care. Waiting times for hospital services are actively monitored and managed. Improvements are implemented based on patient satisfaction feedback. The hospital addresses patient complaints in a timely manner. To support this, hospital resources, including staff, equipment, and supplies, are utilized efficiently. Work processes are organized to minimize delays in service delivery. The hospital manages workload distribution among staff effectively. Standardized procedures improve operational performance. Coordination among departments supports smooth and efficient hospital operations.

Specifically, the level of the hospital quality standards is "Very High" with an overall weighted mean of 3.46. The level of hospital quality standards is in "Very High" levels in all the indicators: Indicator 1 - patient satisfaction with weighted mean of 3.47, verbally interpreted as "Very High" (Rank 1) and Indicator 2 - operational efficiency with a weighted mean of 3.46, with a verbal interpretation of "Very High" (rank 2).

The overall findings support the study of Hussain et al. (2021), which found that quality standards and accreditation improve hospital processes and patient safety. It also supports Araujo et al. (2020), who showed that quality standards enhance efficiency, effectiveness, and patient-centered care. In addition, Swain et al. (2025) highlighted that quality standards improve patient trust and satisfaction. The very high level of hospital quality standards in the result shows that hospitals are performing well in both patient satisfaction and operational efficiency, which aligns with these studies and confirms the importance of quality standards in healthcare.

Table 5 Relationship Between the Level of Health Information System and Service Innovation

Health Information System	Service Innovation	
	Patient convenience	New services offered
System use	r=0.669** Moderate correlation p=0.000	r=0.616** Moderate correlation p=0.000
Ease of use	r=0.561** Moderate correlation p=0.000	r=0.653** Moderate correlation p=0.000
**Significant @ 0.01		

Table 5 shows the relationship between the levels of health information system and service innovation. The computed pearson r-value with its quantitative description (QD) between system use and patient convenience (r=0.669, QD=Moderate Correlation); between system use and new services offered

(r=0.616, QD=moderate Correlation); between ease of use and patient convenience (r=0.561, QD=Moderate Correlation); and ease of use and new services offered (r=0.653, QD=Moderate Correlation) to their p-value of 0.000, 0.000, 0.000, and 0.000 respectively, are less than the significance level of 0.01 which conclude that there is a significant relationship between the level of health information system and service innovation. The findings reveal a moderate correlation between their sub-variables. This implies that the higher the level of health information system in terms of system use and ease of use, the higher the level of service innovation in terms of patient convenience and new services offered.

The result shows a significant relationship between health information systems and service innovation, and this supports the studies of Sheikh et al. (2021), who explained that health information systems enable data-driven improvements and faster innovation in healthcare services. It also affirms Esdar et al. (2021), who found that high-quality health information systems improve service innovation when aligned with organizational capabilities and workflows. In addition, Herawati et al. (2022) emphasized that strong health information systems support better service delivery and continuous improvement. The moderate correlation in the result indicates that better system use and ease of use are linked with higher service innovation, which aligns with these studies and shows that digital systems help improve healthcare services.

Table 6 Relationship Between the Level of The Health Information System and Data Governance

Health Information System	Data Governance	
	Data privacy policy	Staff training on data protection
System use	r=0.546** Moderate correlation p=0.000	r=0.483** Moderate correlation p=0.000
Ease of use	r=0.529** Moderate correlation p=0.000	r=0.469** Moderate correlation p=0.000
**Significant @ 0.01		

Table 6 presents the relationship between the levels of health information systems and data governance. The computed pearson r-value with its quantitative description (QD) between system use and data privacy policy (r=0.546, QD=Moderate Correlation); between system use and staff training on data protection (r=0.483, QD=moderate Correlation); between ease of use and data privacy policy (r=0.529, QD=Moderate Correlation); and between ease of use and staff training on data protection (r=0.469, QD=Moderate Correlation) to their p-value of 0.000, 0.000, 0.000, and 0.000 respectively, are less than the significance level of 0.01 which conclude that there is a significant relationship between the level of health information systems and data governance. The findings reveal a moderate correlation between their sub-variables. This implies that the higher the level of the health information system in terms of system use and ease of use, the higher the level of data governance in terms of data privacy policy and staff training on data protection.

The findings on the relationship between health information systems and data governance affirms the findings of Ngesimani et al. (2022), who stated that effective health information systems depend on strong data governance to ensure data quality and reliability. It also supports Oktaviana et al. (2025), who found that weak governance can lead to poor data quality and reduced system effectiveness, while strong

governance improves performance. Furthermore, Merotiwon et al. (2022) emphasized that governance roles and policies are important in ensuring data security, privacy, and compliance. The moderate correlation in the result shows that better system use and ease of use are associated with stronger data governance, which agrees with these studies.

Table 7Relationship Between the Level of Service Innovation and Data Governance

Service Innovation	Data Governance	
	Data privacy policy	Staff training on data protection
Patient convenience	r=0.522** Moderate correlation p=0.000	r=0.546** Moderate correlation p=0.000
New services offered	r=0.673** Moderate correlation p=0.000	r=0.577** Moderate correlation p=0.000
**Significant @ 0.01		

Table 7 shows the relationship between the levels of service innovation and data governance. The computed pearson r-value with its quantitative description (QD) between patient convenience and data privacy policy (r=0.522, QD=Moderate Correlation); between patient convenience and staff training on data protection (r=0.546, QD=moderate Correlation); between new services offered and data privacy policy (r=0.637, QD=Moderate Correlation); and between new services offered and staff training on data protection (r=0.577, QD=Moderate Correlation) to their p-value of 0.000, 0.000, 0.000, and 0.000 respectively, are less than the significance level of 0.01 which conclude that there is a significant relationship between the level of service innovation and data governance. The findings reveal a moderate correlation between their sub-variables. This implies that the higher the level of service innovation in terms of patient convenience and new services offered, the higher the level of data governance in terms of data privacy policy and staff training on data protection.

The result on the relationship between service innovation and data governance supports the study of Vial (2023), which explained that data governance enables and supports service innovation by ensuring responsible and effective use of data. It also supports Davidson et al. (2023), who found that strong governance allows organizations to create new services while managing risks related to privacy and security. In addition, Gegenhuber (2023) emphasized that governance is important in coordinating data and supporting collaboration in service innovation. The moderate correlation in the result shows that higher service innovation is linked with stronger data governance, which agrees with these studies and highlights that governance supports innovation in healthcare.

Table 8 Regression Analysis between the Level of Health Information System, Level of Service Innovation and Level of Data Governance taken Singly or in Combination of Hospital Quality Standards

Predictor	Dependent Variable	R^2	F	p-value	β	t	p-value
Patient convenience		0.723	85.530	0.000	0.183	3.287	0.001*

New services offered	Hospital quality standards (overall)				0.178	3.176	0.002*
Overall Data governance					0.318	2.748	0.007*
*Significant @ 0.01							

Table 8 presents the results of the regression analysis examining how the level of health information system, service innovation, and data governance, whether taken singly or in combination, predict hospital quality standards. The model shows an R^2 value of 0.723, indicating that 72.3% of the variance in hospital quality standards is explained by the predictors, which reflects strong explanatory power. The computed F-value of 85.530 with a p-value of 0.000 confirms that the regression model is statistically significant, meaning that the variables collectively have a significant influence on hospital quality standards.

In terms of individual predictors, patient convenience ($\beta = 0.183$, $p = 0.001$), new services offered ($\beta = 0.178$, $p = 0.002$), and overall data governance ($\beta = 0.318$, $p = 0.007$) all show positive and statistically significant effects at the 0.01 level. Among these, overall data governance has the strongest influence, followed by patient convenience and new services offered. The t-values further support the significance of each predictor, indicating that their effects are not due to chance. Overall, the findings suggest that improving data governance, enhancing patient convenience, and expanding service offerings contribute to higher hospital quality standards.

Conclusion and Recommendation

Based on the results of the study, it can be concluded that the hospital effectively utilizes health information systems as part of daily quality management, enabling fast access to data, accurate monitoring, and efficient documentation. These systems are easy to use and support timely and reliable healthcare delivery. The hospital also implements service innovations that improve patient convenience, reduce waiting times, and streamline processes, ensuring that services remain responsive to patient needs and aligned with current standards. Strong data governance practices are evident through clear privacy policies, regular monitoring, and staff training, ensuring the protection and proper handling of patient information. Hospital operations are well-organized, with coordinated workflows, fair workload distribution, and patient-centered care that enhances overall service quality. The study also found that higher levels of health information systems are associated with higher service innovation and data governance, with moderate relationships among the variables. Improving data governance, patient convenience, and service offerings contributes to better hospital quality standards, highlighting the need to implement and sustain the proposed strategic plan. In line with these findings, healthcare staff are encouraged to continue effectively using health information systems, ensure accurate data handling, and actively support service innovation and patient-centered practices. Hospital administration should strengthen system integration, prioritize data governance through strict policies and continuous training, and invest in system improvements and innovative services. Policy makers are encouraged to support digital transformation, strengthen data governance standards, and promote innovation through policies and training programs. Future researchers are advised to expand the study by exploring additional variables, using different methods, and conducting similar studies in other settings to further validate the findings.

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