

THE NEXUS AMONG SYSTEMS QUALITY, INFORMATION QUALITY, DECISION MAKING AND HOSPITAL FINANCIAL PERFORMANCE

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ABSTRACT

Hospital financial performance represents a critical determinant of operational sustainability and investment viability within the healthcare sector. In recent years, numerous hospitals have undertaken significant investments in the development of hospital information systems. Nevertheless, empirical investigations into the role of such systems in enhancing financial performance remain limited. This study aims to examine the influence of system quality and information quality on decision-making processes and financial performance in hospitals. Data were obtained through a survey administered to 75 hospital managers in Surabaya. The research model was tested using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The results reveal that system quality exerts a significant direct effect on both decision-making and hospital financial performance. While information quality demonstrates a significant influence on decision-making, it does not exhibit a statistically significant impact on financial performance. These findings underscore the importance of high-quality systems and information in facilitating more effective decision-making, which may ultimately contribute to improved financial outcomes in hospital settings.

ABSTRAK

Kinerja keuangan rumah sakit merupakan aspek krusial yang dapat menentukan keberlanjutan operasional dan investasi di sektor kesehatan. Banyak rumah sakit yang telah melakukan investasi untuk membangun sistem informasi rumah sakit. Namun, penelitian mengenai peran sistem informasi terhadap kinerja keuangan rumah sakit masih terbatas. Penelitian ini bertujuan untuk menganalisis pengaruh kualitas sistem dan kualitas informasi terhadap pengambilan keputusan dan kinerja keuangan rumah sakit. Data dikumpulkan melalui survei kepada 75 manajer rumah sakit di Surabaya. Hipotesis penelitian diuji menggunakan dengan pendekatan Partial Least Squares-Structural Equation Modeling (PLS-SEM). Hasil penelitian ini menunjukkan bahwa kualitas sistem berpengaruh signifikan langsung terhadap pengambilan keputusan dan kinerja keuangan rumah sakit. Kualitas informasi juga memberikan kontribusi signifikan terhadap pengambilan keputusan, namun kualitas informasi tidak terbukti berpengaruh signifikan terhadap kinerja keuangan. Hasil ini mengonfirmasi bahwa semakin baik kualitas sistem dan kualitas informasinya, maka pengambilan keputusan dapat lebih efektif, serta pada akhirnya dapat memberikan dampak positif terhadap kinerja keuangan rumah sakit.

INTRODUCTION

The financial sustainability of hospitals is a critical concern that must be maintained and evaluated on an ongoing basis. As healthcare providers, hospitals are primarily tasked with delivering continuous and high-quality medical services—an objective that requires stable and sufficient financial resources. However, global healthcare systems are under increasing pressure due to the emergence of new technologies, demographic shifts, population growth, and heightened public expectations driven by greater access to health information (Birch et al., 2015). These dynamics have amplified the operational and financial challenges faced by healthcare institutions.

In the Indonesian context, hospitals encounter a range of external threats, such as increases in the cost of medical supplies, and sudden spikes in patient volume during health crises such as pandemics (Wiguna & Dewi, 2024). Compounding these issues are the fluctuations in hospital revenue, which often caused by variability in patient numbers and frequent changes in national health policy, as well as persistent limitations in resource availability (Albar et al., 2024).

To remain financially viable, hospitals must ensure that all operational expenditures—covering personnel salaries, pharmaceutical procurement, medical equipment, and facility maintenance—are met accurately and on time (Niedar et al., 2021). Moreover, access to advanced technology is essential to improve service quality. Consequently, hospital management requires decision-support tools that can help identify escalating the cost areas, improve operational efficiency without compromising service effectiveness, and proactively manage resource constraints (Birch et al., 2015).

Several studies have demonstrated the role of information systems in improving hospital performance. Hospital Information Systems (HIS) enable integration across clinical, administrative, and financial divisions, allowing management to obtain timely information for risk mitigation and financial stabilization (Frączkiewicz-Wronka et al., 2021). Robust information systems also provide access to alternative funding sources or service-sharing partnerships, reducing reliance on patient revenue by leveraging government programs, donors, and other financial sectors (Gleißner et al., 2022). Alipour et al., (2017) and Wang et al., (2018) provide evidence that HIS implementation positively affects hospital financial performance. HIS is designed to manage all hospital operations, including clinical, administrative, and financial activities. These functions are integrated into subsystems such as financial information systems, admission-discharge-transfer systems, nursing information systems, laboratory information systems, and pharmacy information systems (Alipour et al., 2017). IT investment and technology-related spending that support hospital operations significantly enhance productivity and positively influence financial outcomes (Wang et al., 2018). Hospitals with well-developed information systems tend to achieve higher return on assets and productivity. With such systems, hospitals can conduct structured budgeting and evaluation, enable better planning of expenditures, and monitor cash flow—thereby improving service quality.

In 2023, there were of 2.925 hospitals under both private and governmental ownership in Indonesia. A significant proportion of these institutions, constituting 64% or 1.854 hospitals, were managed by private organizations. The remaining facilities (27%) were under the purview of regional governments, while 9% were owned by the central government (KementrianKesehatan RI, 2023). East Java Province has the highest number of hospitals in Indonesia (Pristiandaru, 2024). According to the East Java Health Profile Report, in 2023, 71.87% hospitals in East Java were privately managed. Specifically, 67.26% of general hospitals in the region were privately managed, while 32.74% were managed by other entities (DinasKesehatan, 2023). By 2025, the total number of hospitals in East Java had risen to 446, with 319 units (71.52%) being private hospitals (DinasKesehatan, 2025). Surabaya, the capital city of East Java, has the largest number of hospitals in the province, comprising 39 general hospitals, 7 specialized hospitals, and 14 maternity hospitals (Badan Pusat Statistik Provinsi Jawa Timur, 2023).

Hospitals in Surabaya continue to face challenges in HIS implementation, which have produced varying impacts on organizational performance. Common issues include the lack of integration among HIS modules across departments, including electronic medical records (EMR), financial systems, and human resource management systems. Interoperability concerns, shortages of qualified human resources, limited infrastructure, data security risks, and vendor constraints have all been identified as barriers to effective HIS performance (Berliani & Dhamanti, 2024). According to Prof. Hananiel Prakarsa Widjaja, CEO of National Hospital Surabaya, certain modules remain unintegrated well across departments, and it requires manual data entry and then it slows service delivery (Indonesian Clinic and Hospital Asset (ICHA), 2023). RSUD Dr. Soewandhi reported similar issues with human resources in operating the HIS, which initially led to delays in patient services (Febriane, 2022). As a public hospital under the BLUD scheme, RS Dr. Soetomo also struggles with timely financial reporting, efficient data retrieval, accurate billing, and timely incentive distribution. Despite adopting an EMR system, integration issues across service units persist, delaying managerial decision-making. The hospital's annual report attributes these delays to inadequate information system quality, contributing to a 15% decline in operational efficiency in 2022 compared to the previous year (RS Dr. Soetomo, 2019). In contrast, Gotong Royong Hospital—another private hospital in Surabaya—experienced improved efficiency following the transition from manual medical records to an EMR system (Azzahra et al., 2023). Similarly, Universitas Airlangga Hospital (RSUA) received a Best Digital Transformation award from the Indonesian Health Social Security Agency (BPJS Kesehatan) in 2022 after successfully implementing digital queuing and BPJS claims subsystems, which led to enhanced operational efficiency (UnairNews, 2022). These cases illustrate the importance of not only investing in information technology but also ensuring that system quality and the reliability of generated information support hospital management in making informed decisions—ultimately improving both financial and non-financial performance.

Despite its importance, research on hospital information systems quality in Indonesian hospitals remains limited (Amelia et al., 2021). Moreover, studies that examining the relationship between system quality, information quality, and organizational performance have yield mixed results. Some previous research report that information system quality positively affects operational efficiency and decision-making (Alolayyan et al., 2020; Mokoagow et al., 2024), while others find no significant influence to organizational performance (Alshawabkeh et al., 2022; Sewandono et al., 2025). Interestingly, (Al-Okaily et al., 2023; Balic et al., 2022) found that information quality, rather than system quality, significantly affects organizational performance. However, (Thuy, 2024) reported that information quality significantly influences non-financial performance only, with no significant effect on financial outcomes. Additionally, the implementation of information systems in hospitals does not always lead to improved financial performance, particularly when constrained by limited human capital or inadequate technological infrastructure (Santosa et al., 2024). System quality and information quality only contribute meaningfully to organizational performance when information systems are actively utilized in the decision-making process (Sunarta & Astuti, 2023). Therefore, further investigation is needed to understand how system quality and information quality influence hospital performance—especially in the context of hospitals in Surabaya.

This study offers a distinct perspective compared to previous research on hospital performance. While the earlier studies have largely focused on how information systems contribute to general outcomes—such as service user satisfaction or the effectiveness of clinical procedures—they have paid little attention to financial performance. The economic impact of information systems in hospitals remains a relatively underexplored area. Grounded to the information technology economy theory, the information systems are viewed as technological investments that carry economic value. In other words, hospitals that invest in robust information systems should expect measurable economic benefits.

Furthermore, drawing on value chain theory, information systems play a key role in supporting decision-making processes. When system and information quality are high, hospital management is better equipped to make sound economic decisions—decisions that, in turn, can enhance financial performance. A well-designed system can contribute not only to operational efficiency but also to revenue generation and financial resilience. In response, this study places greater emphasis on understanding how information systems influence hospitals' financial outcomes. Therefore, this study seeks to examine whether system quality and information quality influence decision-making and ultimately improve the financial performance of hospitals.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Decision Usefulness Theory

This theory was introduced by George J. Staubus in 1961, and it emphasizes that accounting information must be both relevant and faithfully represented to fulfill its primary function, thereby supporting the managerial activities and investment decision-making (Rahman et al., 2026). Empirically, (Thuy, 2024) concludes that firms which operates in developing economies countries or region, as well as a public-sector organization with inadequate information systems, they require to improve their institutional quality, technical capability, and ethical standards as catalysts for enhancing managerial decision-making process. Normatively, this theory provides a foundation that all organizational transactions and events are not merely recorded, but they also capable to provide decision-making guidance.

Resource Based View Theory

Resource Based View (RBV) Theory

Wernerfelt was introduced RBV in 1984, and explains that an organization's resource conditions can create competitive advantage (Mailani et al., 2024). The organizational resources must be managed strategically to achieve time and cost efficiency, improve performance, and gain advantages over the competitors. According this theory, all types of organizational resources -- including tangible and intangible resources, have potential role to generate competitive advantage. (Ferreira & Ferreira, 2025) reveals that research grounded in RBV continues to be widely developed, particularly addressing the increasing sustainability challenges in modern organizations.

DeLone and McLean (DM) Information Success Model

The Information System Success Model developed by DeLone and McLean posits that high system quality and information quality support more effective decision-making, which in turn enhances organizational financial performance. A reliable system and accurate information facilitate efficient resource management, ultimately contributing to improved financial outcomes. According to DeLone and McLean's model, system quality and information quality directly influence net benefits—interpreted as the overall performance of an entity. In this model, system performance is represented by system quality.

Laudon and Laudon (2020) offer a dual perspective on information systems—technical and business-oriented. From a technical standpoint, an information system comprises a set of interconnected physical components operating according to technical rules to collect, process, store, and disseminate information. From a business perspective, an information system is not merely a collection of devices, but rather a strategic tool employed to create value for the organization. Viewed through this lens, information systems contribute to cost reduction, resource efficiency, revenue generation, and other strategic benefits by producing outputs in the form of information that supports decision-making.

Information quality, within this framework, refers to the quality of the system's output. Accordingly, the "Use" construct in the DeLone and McLean model can be proxied by the decision-making activities (DeLone & McLean, 2003) performed by users. Ideally, these user decisions generate measurable improvements in organizational performance.

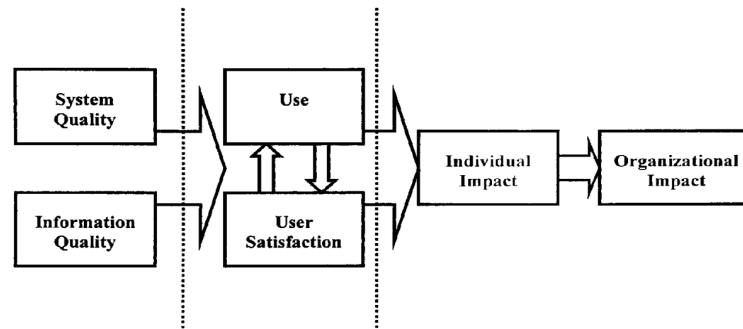


Figure 1. D&M IS Success Model

Source: (Delone & McLean, 2003)

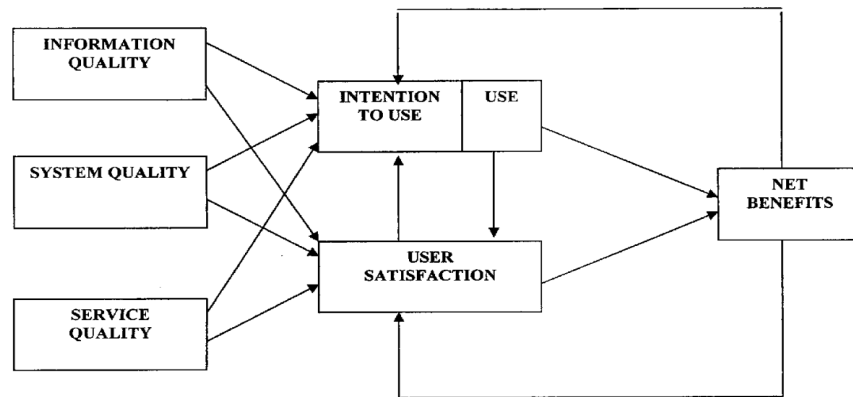


Figure 2. D&M Updated IS Success Model

Source: (Delone & McLean, 2003)

Hospital Financial Performance

Hospital Financial Performance is a critical metric that assesses a hospital's ability to utilize its financial resources effectively to deliver quality care while maintaining financial sustainability. (Dubas-Jakobczyk et al., 2022) studies show that hospital financial performance can be measured based on metric and non-metric indicators. (Baker et al., 2017) surveyed 1.236 healthcare firms and defined that the hospital financial performance as revenue-based productivity (rather than profit-based productivity). In other words, Baker et al (2017) argued that the hospital financial performance is the ability of hospital to gain productivity using its revenue. (Kane et al., 2021) implies that financial performance of hospital or healthcare institutions can be defined as its financial health. The financial health indicators of healthcare institutions are profitability, liquidity, debt capacity and solvency, adequacy of capital investment, and financial burden. (Dubas-Jakobczyk et al., 2022; Wang et al., 2018) views hospital financial performance as hospital's ability in increasing metric financial indicators, such as return on assets and revenue-based productivity. Meanwhile, (Al-Rahhaleh et al., 2023) prefer to measure the hospital financial performance based on hospital management perceptions toward return on investment, market share, sales volume, and profit margin. Hospitals that demonstrate strong financial performance tend to have more reliable systems for quality improvement initiatives, which ultimately contribute to improved patient outcomes (Frączkiewicz-Wronka et al., 2021). This statement suggests that financial stability allows for maintaining donor confidence to invest in qualified public service and management frameworks, as well as maintaining public trust in healthcare. Ultimately, the existence of these reliable systems fosters an environment that supports the delivery of superior healthcare services and improved patient well-being.

Systems Quality

System Quality describes the processing quality of the information system itself. System Quality encompasses the quality of the software and data components, and serves as an indicator that a system is technically sound. In accounting context, (Zohry & Al-Dhubaibi, 2024) use system competence in terms of system quality, and it refers to the desirable attributes of an information system that determine its performance and effectiveness in supporting process accounting functions. The commonly used as systems quality measures are its ease-of-use, functionality, system flexibility, integration, response time, portability, and reliability (Anggraeni & Winarningsih, 2021; Delone & McLean, 2003).

Information Quality

Effective decision-making, efficient operations, and positive patient results are critical goals in managed healthcare, and achieving them is directly linked to the reliability and accuracy of information. High-quality data is the foundation. Yet, managed care organizations have faced considerable hurdles in maintaining this standard. They must navigate difficulties stemming from complicated data origins, demanding compliance requirements, and the ongoing need for robust data management protocols. (Crossette-Thambiah et al., 2024) interviewed of twenty industry leaders in healthcare institutions and concluded that high-quality information ensures the data is consistent and trustworthy, so it leads to more efficient processes and better resource allocation. Information quality commonly measured by the accuracy, timeliness, completeness, relevance, and consistency (Delone & McLean, 2003).

Decision Making

D&M IS Success Model shows that the system uses as intervening factor of the relationships between Information Quality and Systems Quality towards Individual Impacts. Decision making can be defined as the process of identifying problems, generating and evaluating alternatives, and selecting the most appropriate course of action to achieve organizational objectives (Jawad, 2023). Decision-making also refers to the cognitive process undertaken by individuals or groups within an organization to select a course of action from multiple alternatives which can be viewed from rational thinking style, administrative thinking style, and political thinking style (Chang et al., 2023). The aforementioned cognitive procedure frequently optimized the use of technological infrastructure such as Management Information Systems (MIS) and Accounting Information Systems (AIS), which provide relevant and up-to-date data to achieve effective decision-making processes.

Systems Quality Impact to Decision Making

Grounded from Resource-Based View (RBV) Theory, an accounting information system can be regarded as strategic resources which capable to generate sustained competitive advantage when it exhibits characteristics of value, rarity, inimitability, and non-substitutability (Jyoti & Efraxia, 2023). Within D&M IS Success Model framework, systems quality encompasses technical attributes of systems, including reliability, flexibility, integration, and ease of use. Those attributes collectively determine decision making effectiveness. Previous research concluded that systems quality has significant effect on decision making success (Permana & Sutaryo, 2020; Thuy, 2024). The high-quality systems improve the organizational performance through the effective systems utilization or use of applications (Permana & Sutaryo, 2020). A reliable system provides structured and easily accessible data, so it enables the managers to make decisions based on valid and trustworthy information (Hasanah et al., 2021). Kamal (2023) emphasized that integrated data across subsystems facilitates data-driven decision-making and allows managers to conduct comprehensive performance evaluations. Moreover, with a reliable system, managers are able to perform data mining to anticipate potential problems, identify alternative solutions, and support planning processes—all of which contribute to improved financial performance. In essence, the higher the quality of the system, the greater the likelihood that decision-making processes will be carried out

more efficiently, with faster and more accurate outcomes. Thus, it is hypothesized that systems quality has significant impact to decision making.

H₁: Systems Quality has positive impact to Decision Making

Information Quality Impact to Decision Making

From perspective of Decision Usefulness Theory, the high-quality information enhances decision utility by providing reliable inputs for rational decision-making (Wijekoon et al., 2024). Integration of this perspective with RBV Theory and D&M IS Success Model suggests that information quality enriches organizational capability (Singh & Lai, 2026), and it also fulfils the key characteristics such as verifiability and faithful representation. Some research proved that there is significant relationship among information quality to decision making (Ageeb et al., 2024; Little & Coughlan, 2008; Monteiro et al., 2021). High-quality information plays a critical role in financial decision-making within hospitals (Monteiro et al., 2021). Inaccurate or incomplete data can lead to poor decisions, potentially resulting in resource waste or inefficiencies in budget management. (Ageeb et al., 2024) argue that the significance of information quality in influencing organizational performance is mediated by the role of top management decision-making as an intervening variable. Decision-making in hospitals is inherently complex and cannot be equated with that of the manufacturing sector (Moons et al., 2018). It involves interactions across multiple domains, including medical services, pharmaceuticals, medical support units such as laboratories, resource capacity planning, and financial planning. In addition, decision-making occurs across various levels of control—strategic, tactical, offline operational, and online operational. There are four key stakeholders in the healthcare environment: medical staff, administrative personnel, departmental managers, and patients— and each of whom requires specific information and possesses distinct decision-making authority (Little & Coughlan, 2008). According to (Kelly et al., 2023), an effective hospital performance relies on multidisciplinary collaboration, teamwork, and collective decision-making. Consequently, relevant, accurate, and comprehensible information is essential for generating sound decisions. This ensures hospitals can achieve expenditure efficiency, maintain smooth supply chain operations, manage cash flow and other critical resources, and ultimately sustain their operations while preserving the quality of patient care. Information quality operates both as a strategic resource and as a critical determinant of useful information. Consequently, higher level of information quality is expected to enhance the effectiveness of organizational decision-making. Accordingly, it is hypothesized that information quality has positive impact on decision making.

H₂: Information Quality has positive impact to Decision Making

Decision Making Impact to Financial Performance

The linkage between decision making and financial performance within D&M IS Model can be most coherently grounded in RBV Theory (Kero & Bogale, 2023). RBV conceptualize decision-making capability as a core of organizational capability derived from effectiveness of information systems utilization. Previous research concluded that better decision-making can significantly improve financial performance (Kaya et al., 2024; Monteiro et al., 2021). The decision-making in hospital operations—such as resource allocation, staff scheduling, and facility management—directly contributes to operational efficiency. (Moons et al., 2018) found that the achievement of efficiency and effectiveness in hospital services is largely determined by decisions related to the hospital supply chain, including the management of pharmaceutical inventories, medical equipment, infrastructure, human resources, and distribution activities. More specifically, hospitals operate services with constant and critical demand, such as operating rooms. In such contexts, requested items must be available at the right time, in the right place, and in the right condition. This requires precise budgeting and timely realization, ideally at the lowest

possible cost. (Monteiro et al., 2021) demonstrated that the quality of decision-making has a significant impact on organizational financial performance. This implies that when decisions are informed by experience, strategic planning, and available resources—while incorporating best practices as alternative solutions and maintaining alignment with organizational goals—financial performance indicators such as efficiency, positive cash flow, and return on investment can be sustained and optimized. Hence, the hypotheses proposed is the decision making has positive impact to financial performance.

H₃: Decision Making has positive impact to Financial Performance

Systems Quality Impact to Financial Performance

The RBV Theory conceptualized information systems as strategic resources capability that generates competitive advantage (Jyoti & Efpraxia, 2023). Consistent with D&M IS Success, the systems quality constitutes a critical antecedent of net benefit where the value of system is manifested in enhance organizational performance, including financial performance. Previous research reveals that the system quality has been shown to have a significant impact on organizational performance (Ageeb et al., 2024; Permana & Sutaryo, 2020) High quality accounting information systems enable organizations to reduce processing errors, and accelerate business activities. A system that is user-friendly, well-integrated, and consistently provides the necessary features facilitates smoother organizational operations. Conversely, systems that are unstable or insufficiently integrated may lead to inefficiencies in hospital operations, such as errors in financial reporting, delays in insurance claim processing, or inaccurate resource allocation. Unreliable systems can also incur additional costs, including repair expenses, overtime payments, or increased human resource costs to manage patient backlogs or mitigate elevated clinical risks. According to (Wang et al., 2018), hospitals equipped with reliable systems experience improved financial efficiency through reduced operational costs and optimized revenue generation. Accordingly, it is hypothesized that systems quality has positive impact to financial performance.

H₄: Systems Quality has positive impact to Financial Performance

Information Quality Impact to Financial Performance

In RBV Theory, information considered as asset which has strategic value for organization. Some research concluded that information quality significantly contributes to organizational performance significantly (Al-Okaily et al., 2023; Balic et al., 2022; Thuy, 2024). Accurate, timely, and easily comprehensible information supports the achievement of organizational goals Well-organized and timely information enables business processes to be executed more efficiently, saving time, labor, and operational costs. For instance, patients can be treated more promptly, insurance claims can be monitored and processed without delay, and vendor invoices can be settled in a timely manner. Therefore, it is expected that hospitals capable of delivering high-quality information are more likely to achieve improved financial performance. Thus, the hypotheses proposed is information quality has positive impact to financial performance.

H₅: Information Quality has positive impact to Financial Performance

The hypotheses were developed regarding to the integration of D&M IS Success Model and RBV Theory. This research framework depicts the nexus among factors of D&M IS Success Model and Financial Performance. Within this framework, System Quality and Information Quality as critical technological and information resources that enhance quality of decision making, and the effectiveness of information systems to increase financial performance.

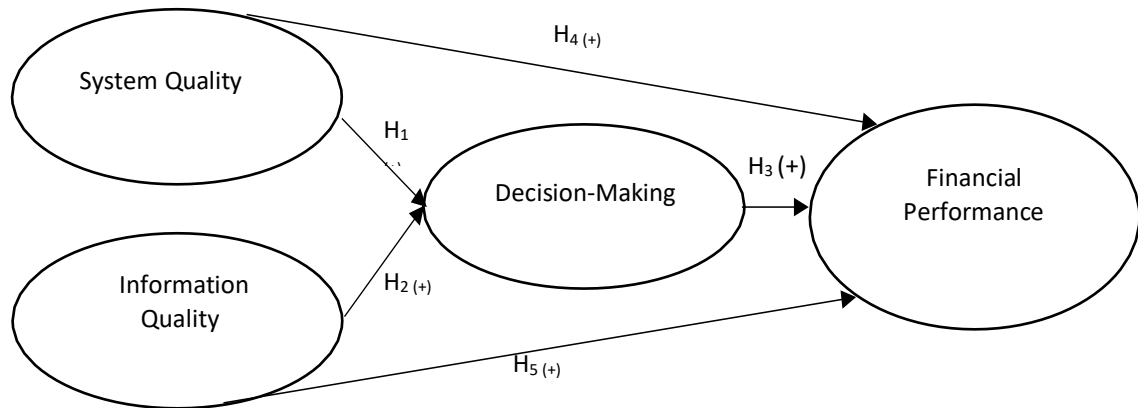


Figure 3. Research Framework

RESEARCH METHOD

This study employed quantitative method. The primary data collected through a structured questionnaire. The questionnaire was distributed to respondents either in the form of a Google Form or as a printed hardcopy, depending on respondents' preferences. The sampling technique used was purposive sampling, which involves selecting research participants based on specific predetermined criteria. Respondents were required to hold at least a middle management position within a hospital division or department. This criterion was established to ensure that participants had relevant experience in decision-making processes and were actively involved in evaluating hospital performance. The variables in this study were measured using a Likert scale, applied to each questionnaire item. Each item was rated on a five-point scale as follows: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree. The indicators in this questionnaire have been adapted to the conditions of the hospital sample.

This study uses primary data and it collected via a structured questionnaire. Hypothesis testing was conducted using Structural Equation Model with Partial Least Squares (SEM-PLS), facilitated by SmartPLS 4.0 software. The outer model was assessed to examine the reliability and validity of the measurement constructs. Convergent validity was evaluated through reflective indicators, focusing on the correlation between each item and its corresponding construct. Following established criteria, a loading factor above 0.70 is deemed acceptable for confirmatory research, while values between 0.50 and 0.60 are considered adequate for exploratory research. The model was further evaluated based on Average Variance Extracted (AVE), where a threshold of >0.50 indicates satisfactory convergent validity, and Composite Reliability (CR) values above 0.70 suggest adequate internal consistency. Additionally, Cronbach's Alpha values exceeding 0.70 confirm the reliability of the constructs (Cheung et al., 2024; Fornell & Larcker, 1981; Ghazali & Latan, 2020).

Table 1. Variables and Indicators

No.	Variables	Indicators	Reference
1.	Financial Performance (FP)	1. This healthcare provide outperforms other healthcare providers with respect to return on investment 2. The growth of the market share of this healthcare exceeds that of its competitors 3. This healthcare provider outperforms other healthcare providers on profit margin (income/sales) 4. This healthcare provider outperforms other healthcare providers on sales volume 5. The growth in return on investment of this healthcare provider exceeds that of its competitors 6. In general, the competitive position of this healthcare provider is superior to that competitor	(Al-Rahhaleh et al., 2023)

No.	Variables	Indicators	Reference
2.	System Quality (SQ)	1. Ease-of-use It is easy to use this application/IS 2. Functionality The systems provides all functions that I need to do my work 3. Adaptability The application/IS accommodates changes to meet updated standards 4. Availability The application/IS downtime is minimum The application/IS support consistently accessible without interruption 5. Reliability The application/IS operates reliable without errors 6. Response time I experience minimal delays when using the application/IS 7. Integration The application/IS integrates well with other organizational systems The application/IS supports real-time data integration	(Aswidani, 2024; Monteiro et al., 2021, 2022; Nabot & Al-Qerem, 2025)
3.	Information Quality (IQ)	1. Accuracy The financial information produced by the application/IS is accurate. 2. Completeness No important data is missing from the systems 3. Understandability I can interpret the output or reports without difficulty 4. Relevance The application/IS provide relevant information to my decision-making needs 5. Consistency The informations provides standardized format 6. Inclusive for all financial aspects that users need in the decision-making process In this application/IS, I can get any information to support my division financial plan or budget decision	(Monteiro et al., 2021; Nabot & Al-Qerem, 2025)
4.	Decision-Making (DM)	1. The decisions that I made enable the organization to obtain operational benefits, managerial advantages, and performance outcomes. 2. Decisions that I made were based on the evaluation of various alternatives or options, allowing the organization to select the most optimal solution. 3. I consider of best practices to made decisions in order to contribute to improved organizational performance. 4. The decisions that I made have contributed to greater organization's efficiency. 5. The decisions that I made have significantly enhanced operational effectiveness. 6. The decisions support the achievement of organizational goals	(Monteiro et al., 2022)

The inner model was tested to assess the structural relationships and predictive capability among latent variables. This involved examining R-squared (R^2) values for endogenous constructs. Based on (Chin, 1998) R^2 values above 0.67 indicate substantial explanatory power, the values between 0.33 and 0.67 indicate moderate explanatory power, and the values around 0.19 are considered weak. The magnitude of change in R^2 reflects the substantive effect of an exogenous latent variable on the endogenous construct. Structural path coefficients were evaluated for significance using bootstrapping procedures, with a p-value threshold of <0.05 indicating a statistically significant effect. Accordingly, if the p-value is <0,05, the

null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted; if the p-value ≥ 0.05 , H_0 is failed to be rejected and it means that the exogenous variable does not significantly affect the endogenous variable.

RESULT AND DISCUSSIONS

The questionnaire was distributed to 58 hospitals in Surabaya. Upon obtaining consent for data collection, the questionnaire was delivered either in hardcopy format or via Google Forms, depending on the preference of the designated contact person. A total of 79 responses were received through the Google Form. However, four responses were excluded from the analysis because the respondents did not meet the required criteria. As a result, 75 valid responses were retained for further analysis. The excluded respondents held positions as clinical nurses and medical records specialists, which fall outside the category of middle management expected to provide relevant insights into decision-making processes—an essential focus of this study. Table 2 presents respondent demographics based on age and structural position. Of the respondents, 55 (73%) were female and 20 (27%) were male. The largest age group was 41–50 years (54%). The most common position held was Head of Nursing Unit (27 respondents, or 36%), followed by Head of Finance Department (11 respondents, or 14,7%), along with other managerial roles. The majority of respondents (42 individuals, or 54%) had over 15 years of work experience, indicating that most participants were senior-level employees.

The validity and reliability tests result fully meet the established criteria. Table 3 shows that the reliability test indicates the Cronbach's Alpha value exceeds of 0,7, and the Composite Reliability value also exceeds 0,7. Furthermore, all outer loading values have met the minimum required threshold of 0,7.

Table 2. Respondent's Demography

No	Demography	n	Percentage
1	Age	31-40	23%
		41-50	54%
		51- 60	20%
		>60 years old	3%
		Total	100%
2	Position	Chair of Nursing Committee	12%
		Head of Ward	36%
		Head of Unit	12%
		Head of Administration	9,4%
		Chair of Quality Committee	2,6%
		The Asset Coordinator	2,6%
		Head of Finance Division	14,7%
		Head of General Affair Division	10,7%
		Total	100%
3	Working period	5-9 years	11%
		10-15 years	33%
		>15 years	56%
		Total	100%
4	Educational Level	Diploma	5%
		Bachelor	48%
		Master	46%
		PhD	1%
		Total	100%

The AVE results presented in Table 4 describe that all AVE values are exceed 0,5. This indicates that all convergent validity criteria have been met. Each indicator of the latent variables effectively represents the concepts being measured and it is clearly understood by the respondents. Subsequently, discriminant validity testing was conducted to ensure that the statements within each latent variable are not mixed with statements from other latent variables, as perceived by the respondents. According to the Fornell-Larcker criterion, a model is considered to meet the discriminant validity requirement when the square root of the AVE for each exogenous construct (values on the diagonal) exceeds the correlation between that construct and the others (values to the left or below the diagonal) (Cheung et al., 2024; Rasoolimanesh, 2022). Table 5 shows that the indicators have met the discriminant validity requirements.

Table 3. Validity and Reliabilitas Test Result

Variabel	Kode	Validity	Reliability	
		Loading Factor	Composite Reliability	Cronbanch's Alpha
System Quality	KS 1	0,803	0,945	0,942
	KS 2	0,819		
	KS 3	0,846		
	KS 4	0,818		
	KS 5	0,729		
	KS 6	0,894		
	KS 7	0,861		
	KS 8	0,854		
	KS 9	0,819		
Information Quality	KI 2	0,873	0,951	0,951
	KI 4	0,872		
	KI 5	0,921		
	KI 7	0,905		
	KI 9	0,900		
	KI 10	0,906		
Decision Making	PK1	0,780	0,792	0,792
	PK 2	0,749		
	PK 3	0,800		
	PK 5	0,810		
Financial Performance	KK1	0,834	0,849	0,843
	KK2	0,711		
	KK4	0,797		
	KK5	0,802		
	KK6	0,770		

Table 4. Average Variance Extracted (AVE) Result

Variabel	AVE	Result
Financial Performance (FP)	0,614	Valid
System Quality (SQ)	0,686	Valid
Information Quality (IQ)	0,803	Valid
Decision Making (DM)	0,616	Valid

Table 5. Discriminant Validity

	SQ	IQ	FP	DM
SQ	0,896			
IQ	0,742	0,784		
FP	0,681	0,781	0,828	
DM	0,636	0,711	0,639	0,785

The R-square test output in the inner model analysis (Table 6) indicates that the R-square for the hospital financial performance variable is 0.726, and it classifies the effect of the variables as strong. This value suggests that the system quality and information quality in the model explain 72.6% of the hospital's financial performance, with the remaining influence being attributed to other variables not included in this study. Furthermore, in this model, decision-making can be explained by system quality and information quality to the extent of 48.4%.

Table 6. R-Square Result

Variabel	R-square	Result
Financial Performance	0,726	Strong
Decision Making	0,484	Moderate

Table 7. Hypotheses Test Result

	Original Sample (O)	Path Coefficient (β)	P-Value	Result
SQ $\rightarrow$ DM	0,385	0,487	0,019	Accepted
IQ $\rightarrow$ DM	0,374	0,342	0,034	Accepted
DM $\rightarrow$ FP	0,259	0,322	0,183	Rejected
SQ $\rightarrow$ FP	0,414	0,343	0,003	Accepted
IQ $\rightarrow$ FP	0,295	0,297	0,058	Rejected

SQ = System Quality; IQ = Information Quality; FP = Financial Performance; DM =Decision Making

As shown as Table 7, the path coefficients and corresponding p-values obtained from the hypothesis tests. The original sample values reflect the estimated path coefficients which derived from the data. All original sample values are as positive sign and it indicates a positive directional relationship between the exogenous and endogenous variables. This result prove that Systems Quality have a positive and significant effect to Decision Making ($\beta=0,487$, p-value=0,019), which it allows to conclude that H1 is accepted. The Systems Quality improvement contributes to better Decision Making. The Information Quality also has positive and significant effect to Decision Making ($\beta=0,342$, p-value=0,034) though the effect size is slightly lower than that of systems quality, the H2 is accepted. Surprisingly, while the Decision Making seems to have a moderate positive effect on Financial Performance, the results is not statistically significant ($\beta=0,322$, p-value=0,183). Our data did not provide sufficient support of decision-making influence toward hospital financial performance (H3). Meanwhile, H4 is supported. The Systems Quality has a significant direct effect to Financial Performance ($\beta=0,343$, p-value=0,003). Finally, the H5 is not supported. Information Quality is not statistically significant to Financial Performance ($\beta=0,297$, p-value=0,058).

Discussion

Systems Quality has significant role to Decision Making (H1). A user-friendly systems, reliable systems, fast response time, and well-integrated systems enhance the quality of decision-making process. The higher system quality directly empowers the users to make better decisions. This result support some previous research (Hasanah et al., 2021; Kamal, 2023; Permana & Sutaryo, 2020).

Information Quality has significant influence to Decision Making (H2). This finding support (Monteiro et al., 2021). Timely, accurate, and relevant information supports effective decision making, though in this model, system quality appears to be even more critical than information quality. IS Success Model by D&M is also supported which decision-making is as proxy of the use of information system, it increased by enhancing the systems quality and information quality. Hospitals should provide better system quality and information quality to improve the decision-making.

These findings are consistent with Decision Usefulness Theory, which emphasizes that effective decision making depends on the availability of reliable systems and high-quality information as essential

inputs for rational judgment. High-quality applications and accurate information enhance users' cognitive capacity, enabling them to evaluate alternatives more effectively and make timely decisions. The results also support the DeLone and McLean Information Systems Success Model, which stated that improvements in system quality and information quality will increase the system use. In the hospital context, information systems are extensively utilized across the entire service supply chain, including patient admissions, clinical procedures, pharmacy services, laboratory operations, financial management, and human resource administration. In addition, hospitals must maintain long-term databases not only for patient medical records, but also for finance, pharmacy inventories, medical and non-medical supplies, and even nutritional logistics such as kitchen inventory and meal planning to ensure patient care continuity. Such complexity requires robust IT infrastructure, adequate system capacity, and highly integrated information systems to support operational efficiency and service responsiveness. Decision making in hospitals must be both timely and cost-efficient, as patient needs can arise unexpectedly and require immediate action. This finding is further supported by an interview with Mrs. Heni, Head of the Hospital Ward, who explained that the system used in her hospital is user-friendly, integrated across departments, and provides informative outputs. Although occasional delays occur due to unstable internet or intranet connectivity caused by electricity or network disruptions, the system substantially assists decision-making in patient services by reducing waiting time for getting information about insurance coverage, treatment confirmation, and room allocation.

The influence of DM to FP (H3) do not significant ($p=0,183$). Thus, in this model DM is not supported as an intervening variable. Several prior studies have yielded the similar findings as they found that decision making has no significant effect to financial performance are Ngugi et al., (2021), Setyani et al., (2022) and Tejerina-Gaite & Fernandez-Temprano (2021). One possible explanation is that managerial decisions are insufficient to generate measurable financial improvements without complementary organizational resources and effective implementation. According to the Resource-Based View, organizational performance is the result of various strategic resources integration rather than isolated managerial capabilities. Furthermore, financial performance in Indonesian hospitals is heavily influenced by external factors, such as government regulations, BPJS reimbursement mechanisms, and budget constraints, which are limit the direct financial impact of managerial decisions. Furthermore, financial performance is an outcome that may take a long time to be realized before the benefits of improved decision-making become apparent, whereas this study used a cross-sectional design. Finally, the significant direct effect of system quality on financial performance suggests that hospital information systems can improve financial outcomes through process automation and operational efficiency. This automation may reduce the relative contribution of managerial decision-making, especially since the majority of respondents were middle managers.

The H4 is supported. SQ has significantly affect FP ($\beta = 0,414$, $p = 0,003$). This finding supports (Ageeb et al., 2024; Permana & Sutaryo, 2020; Wang et al., 2018). The results of this study underscore the critical role of system quality in improving hospital financial performance. Respondents perceived their hospital information systems as highly adaptable, stable, reliable, responsive, and easy to use. These attributes were seen to enhance the speed and accuracy of information processing, thereby contributing to more efficient administrative workflows—such as shorter bureaucratic cycles, reduced patient waiting times, faster insurance claim processing, and smoother billing evaluations. According to this result, The RBV Theory which proposes that superior system quality functions as a strategic organizational resource capable of enhancing financial performance, is supported. The SQ improvements ultimately enhance the financial sustainability and performance of the hospital. Higher system quality enables hospitals to improve operational efficiency through applications that are easy to use, equipped with reliable features, and integrated with accurate data sources across departments. Such system capabilities accelerate

patient service processes, reduce administrative delays, and minimize overtime work, thereby reducing labor-related costs. In addition, well-integrated systems support a more efficient hospital supply chain by improving inventory control, reducing storage costs, and preventing unnecessary operational expenses. The availability of accurate financial data and integrated system features also facilitates smoother billing processes with insurance providers and ensures timely payments to vendors, which ultimately strengthens the hospital's overall financial performance.

The IQ is not statistically significant at the conventional 5% level ($p=0,058$) toward FP. H5 is not supported. However, the path coefficient suggests a positive relationship. This result indicates that information quality does not significantly impact hospital financial performance. Although accurate, timely, and relevant information improves managerial understanding, it is not sufficient to produce improved financial outcomes. The information used by respondents, who were mostly middle managers in hospitals, was also not the type of information that directly related to improved financial performance. Consequently, while there is a significant relationship between information quality and decision-making, information quality is not significantly related to financial performance. According to the DeLone and McLean Information Systems Success Model, information quality primarily contributes to individual-level outcomes, such as improved decision-making, which then impact organizational performance through indirect mechanisms. Some earlier studies were reported similar results, they are: Agyei-Owusu et al., (2021); Rathnayake et al., (2021), and Zulianda et al., (2024).

The lack of empirical support for H3 and H5 may stem from limitations in the respondent profile, which was dominated by middle management personnel and did not include representation from top-level executives (Table 2). While both senior and middle managers are involved in financial planning and performance monitoring—such as budget evaluation, achieving financial sustainability targets, managing cash flows, and ensuring returns on investment and assets—top executives are more strategically oriented, particularly with respect to the hospital's long-term financial viability. Middle managers, by contrast, focus on operational effectiveness and cost efficiency within the hospital's core processes. Their decision-making responsibilities typically encompass resource allocation for patient access, optimization of capacity (e.g., bed occupancy), inventory management of medical and pharmaceutical supplies, deployment of healthcare personnel, and patient flow coordination. Additionally, they are tasked with ensuring integrated service delivery across departments (physicians, laboratories, pharmacies), maintaining the integrity of cost and insurance coverage information, and adhering to government-mandated healthcare service policies. These operational priorities may limit the extent to which middle management decisions reflect broader strategic financial outcomes, thereby affecting the observed relationships in the tested hypotheses.

The role of information technology has evolved from merely supporting administrative functions to becoming a key driver of transformation in healthcare services. An Information System is a combination of information technology, human resources, business processes, data, internal controls, and security measures (Romney et al., 2020). In the hospital context, information systems serve to integrate clinical, administrative, and financial services, thereby enabling a healthcare delivery system that is efficient, responsive, and patient-centered (Wiguna & Dewi, 2024). A well-implemented information system can enhance a hospital's financial performance (Alolayyan et al., 2020). For instance, electronic medical records (EMRs), along with stored patient identities and payment patterns, facilitate both administrative and clinical staff in delivering higher-quality care. From a financial perspective, Lee and Choi (2019) argue that robust hospital information systems effectively manage data related to operational costs, insurance coverage, and patient payment methods. This capability enables easier tracking of bad debts and billings, thus allowing hospital management to plan cash flows more accurately to sustain high-quality patient services. Moreover, hospital information systems function as decision support systems that assist

healthcare professionals in planning, coordinating, and executing integrated activities, thereby improving the effectiveness and efficiency of patient care delivery (Kilsdonk et al., 2017).

The Information Systems (IS) Success Model developed by DeLone and McLean can be applied to explain the role of information systems in hospital financial performance. The System Quality and Information Quality both have been shown to assist management in effectively managing financial resources and other assets, enabling hospitals to reduce costs, maintain cash flow, and assess return on investment. However, in this study, decision-making has not been found to have a significant role. This may be due to the nature of some resource allocation decisions and hospital performance outcomes measured by non-financial or difficult to quantify in monetary terms—such as patient satisfaction, or the satisfaction of other stakeholders including vendors, insurance partners, donors, or investors.

CONCLUSION

Information Systems has important role to help the organization to have better decision making and to enhance hospital financial performance. This research found that the Systems Quality (SQ) is the most influential variable due to it significantly affects both to Decision Making and Financial Performance. The Information Quality (IQ) plays a supporting role. It significantly influences Decision Making, but it has no significant impact to Financial Performance. In this model, The Decision Making (DM) does not have significant effect to Financial Performance. High-quality information systems contribute to the rapidity of strategic decision-making within hospitals, such as budget planning and operational cost control. Furthermore, well-informed decisions facilitated by robust information systems enhance operational efficiency, mitigate resource wastage, and improve the efficacy of budget allocation. Integrated information systems augment precision in organizational financial planning, thereby exerting a positive impact on financial sustainability.

This study has two primary limitations. First, while the model accounts for 72,6% of the variance in Financial Performance, the explanatory power for Decision Making remains moderate, with Systems Quality and Information Quality explaining only 48,4% of its variance. This suggests that additional factors influencing decision-making were not captured in the current model. Second, the scope and number of respondents were limited, and some responses had to be excluded due to non-eligibility, thereby reducing the overall sample size and representativeness. Future research is recommended to extend the current model by incorporating additional relevant variables that may influence decision-making processes. Moreover, expanding the sample to include a broader and more diverse range of respondents, particularly across different management levels and hospital types, could enhance the generalizability of the findings.

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