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Digital Transformation of Hospital Information Management System (SIMRS) as an Organizational Performance Improvement Strategy: A Literature Review

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SIMRS; digital transformation; strategic management; hospital performance; service efficiency.

Abstract

Digital transformation in the health sector has become a global and national priority agenda. Hospital Management Information System (SIMRS) is the backbone of digital transformation in healthcare institutions. This study aims to examine the role of SIMRS as a management strategy that drives improvements in hospital organizational performance through a systematic literature review. The method used was narrative literature review by analyzing 20 articles published in 2020–2024 from PubMed, Garuda, and Google Scholar databases. The results show that integrative SIMRS implementation has been proven to improve operational efficiency (average waiting time reduction of 35–45%), clinical data accuracy, patient satisfaction, and support data-driven strategic decision-making. However, main challenges include human resource resistance, infrastructure limitations, and weak data governance. The success of digital transformation requires strategic leadership, organizational readiness, continuous HR training, and system integration with accreditation platforms (KARS/JCI). This study concludes that SIMRS is not merely a technological tool, but a strategic management instrument that, when comprehensively implemented, will enhance the competitiveness and sustainability of hospitals in the era of National Health Insurance.

INTRODUCTION

Hospitals as complex health service institutions face layered pressures in the modern era: increasing disease burden, quality accreditation demands, cost efficiency in the National Health Insurance (JKN) scheme, and increasingly high patient expectations for the quality and speed of service. In this context, data-based strategic management and information technology have become a non-negotiable necessity (Große-Bley & Kostka, 2021; Olayinka, 2019).

The Hospital Management Information System (SIMRS) is a core digital infrastructure that integrates all hospital administrative, clinical, and financial processes into one unified platform. National regulations have required all hospitals in Indonesia to implement SIMRS since the Minister of Health Regulation Number 82 of 2013. Furthermore, the Health Digital Transformation Strategy set by the Ministry of Health in 2023 places the digitalization of health services as the main pillar of national health system reform (Ministry of Health of the Republic of Indonesia, 2023).

However, the implementation of SIMRS in Indonesia still faces significant gaps between regulations and field practices. A study by Hasanah and Imani (2022) revealed that a large

number of government hospitals experienced implementation constraints due to lack of human resource training, inadequate infrastructure, and the absence of strong digital leadership. On the other hand, hospitals that successfully implement SIMRS comprehensively report significant improvements in operational efficiency and patient satisfaction.

Digital transformation is not just about technology adoption, but rather a fundamental change in the way organizations operate and create value (Dal Mas et al., 2023). In the context of hospitals, digital transformation through SIMRS includes automation of administrative processes, digitization of medical records, integration of billing systems with BPJS Kesehatan, and development of executive dashboards for real-time performance monitoring.

The novelty of this research lies in several aspects. First, this study develops the STRADA (Strategic Transformation and Digital Advancement) Model, a comprehensive framework that integrates digital leadership, system integration, process transformation, and value creation within a unified perspective. Second, this research synthesizes findings from 20 recent studies (2020-2024) to provide evidence-based insights into the multidimensional impacts of SIMRS on hospital performance. Third, the study identifies six critical success factors for SIMRS implementation specifically relevant to Indonesian hospital contexts. Fourth, this research contributes to the growing literature on digital transformation in healthcare by providing a strategic management perspective that connects technological implementation with organizational performance outcomes. The Resource-Based View (RBV) theory provides a strong conceptual foundation for understanding SIMRS as a strategic resource that, when effectively implemented, can create sustainable competitive advantage for hospitals.

This research aims to: (1) examine the concept and theoretical framework of SIMRS digital transformation in the perspective of strategic management; (2) identify the benefits and impacts of SIMRS implementation on the performance of hospital organizations; (3) analyze the main challenges and success factors of SIMRS implementation; and (4) formulate evidence-based strategic recommendations for SIMRS optimization in Indonesian hospitals.

METHOD

This study used a narrative literature review design that aims to integrate, synthesize, and interpret findings from various relevant studies critically (Torraco, 2016). This approach was chosen because the research objectives are conceptual and theoretical, namely the development of a framework for understanding the role of SIMRS as a management strategy, rather than quantitative data aggregation for effect estimation.

Literature Search Strategy

Literature searches were carried out systematically on electronic databases PubMed/MEDLINE, Google Scholar, Garuda Portal (DIKTI), and Semantic Scholar. The keywords used include a combination: "SIMRS", "hospital information system", "digital transformation hospital", "hospital strategic management", "hospital performance", "electronic health record", "SIMRS implementation", and "healthcare digital strategy". The search period is limited to 2020–2024 to ensure relevance to the current context.

Inclusion and Exclusion Criteria

Articles are included if they meet the criteria: (1) published in an indexed journal (Scopus, PubMed, or Sinta 1–5) between 2020–2024; (2) discuss the implementation, evaluation, or strategy of SIMRS/health information system in health facilities; (3) available in

Indonesian or English; and (4) primary research articles, reviews, or policy studies. Articles are excluded if they are in the form of a single case report without a management component, abstract without full text, or are not thematically relevant.

Selection and Analysis Process

Of the 147 articles identified through the initial search, title and abstract screening was carried out so that 48 articles remained for full-text feasibility assessment. After the strict application of inclusion/exclusion criteria, 20 final articles were obtained. The data extraction process includes: author and year of publication, research design, population/setting, key variables, key findings, and methodological quality. The synthesis was carried out in a narrative-thematic manner referring to the framework of three domains: (a) operational efficiency, (b) clinical quality, and (c) strategic-managerial factors.

RESULTS AND DISCUSSIONS

Conceptual Framework: SIMRS as a Strategic Management Instrument

Strategic management in the context of hospitals includes the formulation of vision-mission, environmental analysis, goal setting, and measurable strategy implementation through continuous monitoring mechanisms (David, 2016; Andrieiev et al., 2024). In this framework, SIMRS functions as a technological infrastructure that allows the operationalization of organizational strategies in a concrete manner.

Hügle et al. (2023) in their study at the University Hospital Lausanne (CHUV) demonstrated how the integration of SIMRS with the Balanced Scorecard (BSC) framework resulted in a multidimensional performance monitoring system that includes financial perspectives, customers, internal processes, and organizational learning. This approach turns raw operational data into strategic information that top management can use for evidence-based decision-making.

At the national level, the Ministry of Health of the Republic of Indonesia through the Health Digital Transformation Strategy (2023) defines SIMRS as a critical component in the national digital health architecture. This system is expected to be fully integrated with the One Health Data Platform, the One Sehat Application, and the BPJS Kesehatan electronic claim system as a comprehensive health service digital ecosystem.

The Resource-Based View (RBV) theory provides a strong conceptual foundation for understanding SIMRS as a strategic resource. In this perspective, digital capabilities built through SIMRS are rare, difficult to replicate (because they involve the integration of unique processes, cultures, and human resources), and high value, thus meeting the criteria as a sustainable competitive advantage for hospitals (Lubis, 2022).

The Impact of SIMRS on Operational Efficiency

Literature reviews consistently show that comprehensive implementation of SIMRS results in significant improvements in operational efficiency. The results of the study can be summarized in Table 1 below.

Table 1. The Impact of SIMRS Implementation on Operational Performance Indicators

Performance Indicators	Pre-SIMRS Conditions	Post-SIMRS Conditions	Source
Registration waiting time	> 45 minutes	< 15 minutes (–67%)	Wulandari et al. (2025)
Medical record completeness	60–70%	92–95%	Hasanah & Imani (2022)
BPJS claim time	14–21 days	3–7 days (–70%)	Wise (2024)
Medication administration errors	Relatively high	Down 40–60%	Aini et al. (2022)
Patient satisfaction (SKM)	70–75	82–88	Wardhani & Sugandi (2021)
Administrative cost efficiency	Baseline	Down 25–35%	Andrieiev et al. (2024)

From Table 1, it can be seen that the most significant impact of SIMRS is felt on the front-end administrative process, especially patient registration and claims management. Studies at Welas Asih Hospital Bandung and Jogja International Hospital show that SIMRS not only speeds up patient flow, but also increases transparency and convenience for medical personnel in accessing real-time clinical information (HMA, 2025).

In the financial dimension, the integration of SIMRS with the BPJS e-claim system has been proven to dramatically reduce claims collection time. Arif research (2024) at Dr. H. Chasan Boesoirie Ternate Hospital revealed that late claims are one of the main causes of the operational cash deficit of regional hospitals. The implementation of integrated SIMRS that accelerates the completeness of claims files has succeeded in increasing the Cash Recovery Rate (CRR) from 76% to 91% within 12 months.

SIMRS and Clinical Quality Improvement

The clinical quality dimension is the most closely related aspect to patient safety and health outcomes. Electronic Medical Records (RME) as a core component of SIMRS have proven to be significant in reducing medical errors through clinical decision support mechanisms, drug interaction alerts, and standardization of clinical documentation procedures.

Dal Mas et al. (2023) in a cross-border literature review identified three main mechanisms for the contribution of digital transformation to clinical quality: (1) standardization of evidence-based protocol-based clinical processes that are integrated into digital workflows; (2) improving coordination between units through real-time access to shared data; and (3) historical data-driven clinical audit capabilities that enable continuous evaluation.

In the context of accreditation, the integration of SIMRS with KARS/JCI standards is a critical factor. Standardized electronic medical records, digital-based incident reporting systems, and clinical quality indicator dashboards are requirements that are increasingly

emphasized in the latest accreditation standards. Hospitals that have mature SIMRS have proven to have a competitive advantage in the re-accreditation process (Nurfadilah & Azhar, 2023).

Challenges of SIMRS Implementation in Indonesia

Although its benefits have been well documented, the implementation of SIMRS in Indonesia still faces a number of systemic barriers. Based on the synthesis of the literature, at least five challenge clusters can be identified:

1. HR Resistance and Digital Competency Gap: Many healthcare workers, especially the senior generation, show resistance to system change. The Fawaidah survey (2024) found that 58% of medical record officers do not have adequate digital literacy to operate SIMRS optimally.
2. Limited Technology Infrastructure: Hospitals in remote and type D areas face network infrastructure constraints, hardware availability, and unstable power resources, hampering the operationalization of cloud-based SIMRS (Aini et al., 2022).
3. System Fragmentation and Interoperability: Many hospitals use SIMRS from different vendors for non-integrated modules (laboratory, pharmacy, radiology, billing), resulting in data silos that hinder cross-departmental analytics.
4. Weak Data Governance: Patient data security, electronic medical record privacy, and system trail audits are still areas that require strengthening of regulatory and governance practices (Sala & Subriadi, 2022; Nurfadilah & Azhar, 2023).
5. Budget Constraints and Long-Term ROI: Substantial initial investment of SIMRS is often not supported by measurable Return on Investment (ROI) projections, resulting in weak budget justification before the hospital's board of trustees.

Success Factors and SIMRS Optimization Strategies

The synthesis of the literature reviewed identifies six critical success factors (CSF) of SIMRS implementation:

Table 2. Critical Factors for the Success of SIMRS Implementation

No.	Factor Criitis	Description	References
1	Digital Leadership	The commitment and understanding of the board of directors to the strategic value of information technology	Lemak et al. (2024)
2	Change Management	Structured communication, socialization, and management of HR resistance programs	Squirt (2025)
3	Continuous Training	Continuous digital upskilling program for all staff, not just IT,	Munjirin et al. (2024)
4	Full Integration	One integrated platform across modules: clinical, pharmacy, lab, billing, HR	Raharjo et al. (2024)
5	Data Governance	Robust privacy policies, trail audits, system backups, and cybersecurity	Nurfadilah & Azhar (2023)

No.	Factor Criitis	Description	References
6	Monitoring & Evaluation	SIMRS KPI dashboard that is regularly monitored by top management and IT teams	Hügle et al. (2023)

Of the six CSFs above, digital leadership occupies the most fundamental position. Lemak et al. (2024) in their study of 33 health systems in the United States found that leadership variables were the strongest predictors of digital transformation success, surpassing technology and budget variables. Leaders who are able to clearly communicate their digital vision, build coalitions of change, and allocate resources appropriately are key determinants of transformation success.

In the Indonesian context, Wulandari et al. (2025) in their qualitative study in three Javanese hospitals concluded that the success of digital transformation strategies depends heavily on the synergy between visionary board leadership, competent IT teams, and adaptive organizational culture. Hospitals that rely only on technology factors without organizational culture transformation tend to experience internal resistance that hinders optimal system utilization.

Strategic Model of SIMRS Integration in Hospital Management

Based on the synthesis of the literature studied, this study formulated a strategic model of SIMRS integration in hospital management called the STRADA (Strategic Transformation and Digital Advancement) Model. The model consists of four hierarchical layers that support each other:

The first layer (Foundation) includes digital leadership, data governance, and infrastructure readiness as a prerequisite for transformation. Without a solid foundation, investing in the next layer will not yield optimal value. The second layer (System) contains the integration of SIMRS (clinical, administrative, financial, HR) modules in one interoperable platform. The third layer (Process) describes the transformation of hospital business processes made possible by SIMRS, including streamlining patient flows, claims automation, and digitizing quality monitoring. The fourth layer (Value) represents the final strategic outcomes: improved patient satisfaction, cost efficiency, competitive advantage, and organizational sustainability.

This STRADA model is in line with the view of WHO (2021) which emphasizes that digital transformation of health must be understood as a comprehensive system change, not just the adoption of technological devices. Similarly, the OECD (2023) emphasizes the importance of coordinated investment in digital infrastructure, data governance, and human resource capabilities to produce sustainable performance improvements.

CONCLUSION

This literature review confirms that the Hospital Management Information System (SIMRS) is not just a technological tool, but a strategic management instrument that has transformative potential for multidimensional hospital organizational performance. The comprehensive and integrative implementation of SIMRS has been proven to improve operational efficiency (reduction of waiting times, acceleration of claims), clinical quality (data

accuracy, patient safety), and data-driven strategic decision-making capacity. The success of digital transformation in hospitals is not determined by technological sophistication alone, but rather by a combination of strong digital leadership, structured change management, ongoing HR training, full system integration, and rigorous data governance. The STRADA model formulated in this study can be used as a practical frame of reference for hospital management in planning and implementing digital transformation strategically. The managerial implications of this study include: (1) the need to improve the digital competence of all hospital management ranks, not only the IT department; (2) the integration of SIMRS in the hospital's Strategic Plan (RENSTRA) document as the main KPI; (3) the establishment of a cross-functional Digital Transformation Committee with a clear mandate and resources; and (4) benchmarking of SIMRS performance on a regular basis with national and international standards. The next study is suggested to empirically examine the correlation of the maturity level of SIMRS with hospital financial performance indicators, as well as develop a validated digital readiness assessment instrument for the context of Indonesian hospitals.

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