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Optimization of Management Information System for Improving Hospital Performance

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Abstract

In the era of digital transformation, the optimization of Hospital Management Information Systems (HMIS) is crucial for enhancing hospital performance, improving service quality, and streamlining administrative processes. This study examines the impact of HMIS implementation in a regional public hospital, focusing on its benefits, challenges, and strategies for effective adoption. Using a qualitative descriptive approach, data were collected through in-depth interviews, observations, and document analysis involving hospital managers, IT staff, and healthcare workers. The findings reveal that HMIS significantly improves operational efficiency by reducing manual errors, accelerating reporting, and enhancing transparency in administrative and clinical processes. Patients benefit from faster services, such as streamlined registration and prescription management, while medical staff gain quicker access to patient records, aiding diagnosis and treatment. However, challenges include disparities in digital literacy among staff, insufficient training, and technical issues such as unstable network infrastructure. Additionally, partial integration of HMIS across hospital units limits its full potential. The study underscores the importance of leadership commitment, continuous training, and systemic readiness to address these challenges. A holistic approach involving technological upgrades, policy reinforcement, and *cultural adaptation* is essential for maximizing HMIS benefits. The research contributes to the discourse on health information systems by offering practical insights for hospitals undergoing digital transformation, emphasizing the need for collaboration among stakeholders to achieve sustainable improvements in healthcare service delivery.

Keywords: Hospital Management, Management Information System, Digitalization, Healthcare Services, Operational Efficiency

INTRODUCTION

In the continuously evolving digital era, the need for efficiency and effectiveness in healthcare services has become increasingly urgent. Hospitals, as one of the vital institutions within the public service system, are required to deliver services that are fast, accurate, and of high quality (Makalesi et al., 2021; Sanjuluca et al., 2022). The challenges faced by hospitals are not limited to the quality of medical services but also encompass complex managerial and administrative aspects. In this context, the *Hospital Management Information System* (*HMIS*) serves as a strategic solution to integrate various internal processes of the hospital into a well-connected and organized system (Arora & Ikbal, 2023; Darwis et al., 2023; Febrita et al., 2021; Ferdianti et al., 2022; Zarei & Sadoughi, 2016).

A major issue commonly found in traditional hospitals is the delay in information, data discrepancies, and lack of coordination among departments. Manual procedures that are still used in many hospitals cause delays in data recording, patient data processing, and decision-making, which carry a high risk of error (Karem et al., 2016). This inevitably affects the quality

of service and patient satisfaction. Therefore, an automated and digitized information system is an urgent necessity to reduce such inefficiencies.

HMIS is software designed to assist in managing all aspects of hospital operations, from administration, medical records, logistics, and finance, to quality control. With this system, hospital management can access real-time data, conduct data-driven analyses, and allocate resources more accurately. On the other hand, medical personnel and patients also benefit from faster and more accurate services.

The implementation of *HMIS* is not only about providing technology but also involves the readiness of human resources (*HR*), the process of organizational adaptation, and the commitment of hospital management (Nair, 2022; Rajpal et al., 2018; Susanti, 2021). Many cases show that the failure to optimize *HMIS* stems from insufficient user training, resistance to change, and budget constraints. Therefore, a systemic and participatory approach is essential in the comprehensive development and implementation of *HMIS*.

Hospital performance heavily depends on how well information can be managed and utilized. Complete, accurate, and timely information supports strategic decision-making by hospital management. In this regard, *HMIS* is not merely an administrative tool, but also a crucial instrument for service policy planning, performance evaluation of work units, and supporting institutional accountability to the public and the government.

The optimization of *HMIS* can provide significant benefits, ranging from improved operational efficiency to enhanced quality of healthcare services. Other advantages include the ability to reduce operational costs by minimizing data duplication and administrative errors, as well as improving transparency in financial and inventory management. Amid growing public demands for quality healthcare services, digital transformation through *HMIS* is becoming a necessity rather than an option.

Previous research has demonstrated the potential of *HMIS* to transform hospital operations. Studies by Shamsi (2024) and Rahayudi et al. (2021) highlight its role in improving efficiency and reducing costs, while Kagoya et al. (2020) and Situmeang et al. (2023) identify persistent challenges, such as staff resistance and incomplete system integration. Despite these insights, there remains a gap in understanding how to effectively implement *HMIS* in resource-limited settings, particularly in regional hospitals where infrastructure and digital literacy may be lacking. Additionally, few studies offer practical strategies for overcoming non-technical barriers, such as *organizational culture* and *workforce readiness*.

Nonetheless, various technical and non-technical challenges often hinder the *HMIS* optimization process. Technical challenges may include system integration with legacy devices, limited network infrastructure, and inadequate data security. Meanwhile, non-technical obstacles such as an *organizational culture* that is not ready for digitalization, low technological literacy among staff, and coordination problems between institutions often pose significant barriers.

This study aims to examine how the optimization of the *Hospital Management Information System* can contribute to improving hospital performance. The main focus is directed at identifying strategies, supporting factors, and obstacles in the implementation of *HMIS*. Through this approach, the study is expected to offer both theoretical and practical contributions to the development of health information systems in Indonesia, particularly in the context of public and regional hospitals. The findings will be valuable not only for hospital

administrators and policymakers but also for the global healthcare community seeking scalable solutions for digital transformation.

Given the crucial role of *HMIS* in the healthcare service system, it is time for all parties involved in hospital management—from administrators and healthcare workers to the government—to strengthen synergy in realizing modern, responsive, and data-driven hospitals. The optimization of *HMIS* is not only a step toward efficiency but also a concrete manifestation of digital transformation in the health sector to address both present and future challenges.

METHODS

This study employed a qualitative descriptive approach with the aim of gaining an in-depth understanding of the optimization process of the Hospital Management Information System (HMIS) and its impact on improving hospital performance. A qualitative approach was chosen because it could depict social and technical phenomena in a more contextual manner, particularly in observing the interaction between information technology systems and managerial elements within healthcare service organizations. This study did not aim to test hypotheses statistically, but rather to explore the dynamics of HMIS implementation and how the system contributed to better hospital governance.

The research site was focused on a regional public hospital (*RSUD*) that had implemented HMIS for more than three years. The location was selected based on the consideration that the hospital had adequate documentation related to HMIS implementation and had demonstrated management's commitment to continuously developing the system. A purposive sampling technique was used to select key informants, consisting of hospital managers, IT staff, medical records officers, and healthcare workers who were directly involved in the use of the system. These informants were chosen because they possessed experience and direct understanding of the system's operation and the challenges encountered in the field.

Data collection was conducted through in-depth interviews, direct observation, and document study. The interviews were conducted in a semi-structured manner, allowing informants to provide broad yet focused explanations in accordance with the research objectives. Observation was carried out to understand the actual use of HMIS in the hospital's daily operations, while documentation was used to trace historical data, performance reports, and internal policies related to the information system. The combination of these three techniques enabled the researcher to obtain triangulated and valid data for understanding the phenomenon being studied.

Data analysis was conducted through the processes of data reduction, data display, and conclusion drawing. The collected data were systematically organized and coded based on main themes such as HMIS benefits, implementation barriers, optimization strategies, and its impact on performance. The data were then analyzed using thematic analysis techniques to identify patterns emerging from various information sources. This study also paid attention to ethical aspects, such as ensuring the confidentiality of informants' identities and obtaining consent prior to interviews, to maintain the integrity of the research process.

RESULT

Research findings indicate that the implementation of the Hospital Management

Information System (SIMRS) at the studied hospital has been in place for more than three years, supported by internal regulations and consistent annual budget allocations. The system has been applied to most service and managerial units, including registration, outpatient care, inpatient care, laboratories, pharmacy, and finance. However, not all units are fully integrated, resulting in some manual processes remaining in certain work stages, particularly in support units that are not yet connected in real time to the central system.

Hospital management stated that SIMRS has helped enhance transparency in administrative processes. This is evident in the reduction of recording errors, faster report generation, and ease of conducting internal audits. Additionally, the presence of SIMRS has accelerated reporting to the health department and other regulatory agencies, thereby improving the hospital's accountability and compliance with minimum service standards.

From the patient service perspective, SIMRS has had a positive impact by streamlining service flows, especially in registration and prescription processes. Patients no longer need to manually fill in their data, as the system stores historical visit records. Medical records can be accessed more quickly by doctors and nurses, enabling faster diagnosis and treatment. However, during peak hours or system disruptions, services can be delayed due to the hospital's heavy reliance on available computer networks and devices. Interviews with medical record officers and healthcare workers revealed that SIMRS has improved the accuracy of patient data and facilitated the tracking of medical histories. This also supports the hospital’s ability to conduct simple epidemiological analyses and map dominant diseases treated. Some medical staff even stated that SIMRS assists in decision-making due to the more complete and systematically organized data.

Despite these benefits, a major challenge is the disparity in digital literacy among hospital staff. Some senior staff admitted to having difficulties using certain features of the system. Training provided by the management has not been evenly distributed and tends to be technical, lacking a user needs-based approach. As a result, some users experience confusion when entering data or interpreting reports, which affects the quality of information produced by the system. In addition to human resource challenges, technical obstacles also exist, particularly in network infrastructure. The hospital under study does not have a backup internet network, so when a major disruption occurs, all SIMRS-based services are temporarily halted. This causes service congestion and forces staff to revert to manual documentation, which then requires extra time to re-synchronize with the system once the network is restored.

In terms of performance monitoring, SIMRS has been utilized as a tool for compiling monthly and annual performance reports. The system automatically records visit numbers, types of services provided, medication usage, and healthcare worker workloads. This information is processed by the planning division for program evaluation and resource planning. Management stated that decision-making has become more data-driven compared to the previous period.

So far, SIMRS user training has been carried out gradually but has not reached all staff levels. Training has mainly focused on administrative and financial personnel, while medical personnel have only received informal guidance from senior colleagues or peers. This highlights the need for a more systematic and ongoing training program so that all users can understand and optimize the system’s features.

The integration between SIMRS and the BPJS claim system is also a significant factor

in improving the efficiency of financial services. Claim verification processes have become faster because patient data, medical procedures, and medication usage are recorded electronically. However, occasional data mismatches caused by input errors or system failures can delay the disbursement of BPJS claims.

Hospital management reported an increase in patient visits since the implementation of SIMRS. This is attributed to increased patient satisfaction with the speed and accuracy of services, although not all patients fully understand that system-based services require administrative readiness, such as accurate card numbers and complete personal data. The hospital has begun to educate patients through banners and short videos to streamline the registration process. On data security, the hospital has started implementing weekly data backups and access restrictions based on user levels. Patient data is considered a critical asset that must be protected, though not all data protection procedures currently comply with health information security standards. Therefore, the hospital's IT department emphasized the need to update policies and enhance data protection systems to mitigate the risk of breaches or cyberattacks.

In terms of accreditation, SIMRS is a crucial indicator supporting compliance with hospital information management standards. The accreditation team noted that the presence of an information system facilitated the assessment process because documentation and reports are available electronically. This has been a value-added factor in the hospital's accreditation renewal process, particularly concerning administrative and medical record standards. In general, the use of SIMRS at the studied hospital has shown positive impacts on service efficiency, improved management accountability, and accelerated work processes. Although several challenges remain, the presence of this information system is seen as a significant milestone in the digital transformation of healthcare services. Hospital management expressed their commitment to continuously develop the system in line with organizational needs and current information technology trends.

This research also found that the success of SIMRS strongly depends on the synergy between management, healthcare workers, IT teams, and regulatory support from the government. Without strong collaboration, the information system could become an additional burden for users. Therefore, hospitals are encouraged to develop a digital culture and strengthen organizational capacity to adapt to technology-based changes.

The research findings show that the Hospital Management Information System (SIMRS) has a positive impact on streamlining workflows and improving hospital performance. This system simplifies both administrative and clinical processes, which were previously time-consuming and prone to manual errors. One of the main advantages recognized by healthcare professionals is the rapid access to patient data, medical history, and service status. This indicates that digitalizing services is not merely a necessity, but also a concrete solution to challenges of efficiency and service quality.

However, the findings also reveal that the implementation of information technology in hospitals still faces various internal obstacles. Low digital literacy among staff is a major challenge in optimizing SIMRS. Many staff members—particularly those who have long worked with conventional methods—find it difficult to understand the system interface. The lack of comprehensive training leads to resistance to change, which ultimately affects performance and the reliability of data in the system.

From a managerial perspective, SIMRS should serve as a tool in policy formulation and hospital service strategies. However, if data input quality is not maintained, the information produced by the system becomes invalid. Therefore, there is a need to strengthen data supervision and quality control, including clear delineation of responsibilities among data entry personnel, system administrators, and decision-makers. In this context, information systems cannot stand alone but must be integrated with sound governance systems.

SIMRS also plays a vital role in hospital performance reporting and evaluation. With automated reporting features, management can monitor key indicators such as the number of patients, waiting times, drug consumption, and medical staff workload. This data enables evidence-based planning and data-driven evaluation—both of which are core principles in modern health management. These advantages must be supported by a reporting system with a clear structure relevant to managerial needs.

Nonetheless, infrastructure limitations remain a critical issue for SIMRS sustainability. Dependence on a stable internet connection and the availability of adequate hardware are technical aspects that cannot be overlooked. In the hospitals studied, the absence of a backup network often forced staff to revert to manual methods. This condition proves that digital transformation requires systemic readiness in terms of technology, policy, and human resources.

Additionally, the relationship between SIMRS and hospital accreditation must be highlighted. This information system supports various accreditation standards, from service management to patient safety. With digital data and documentation readily available, the accreditation process can be faster and more efficient. However, if the system is not fully utilized, its function in supporting quality standards will diminish. Therefore, the involvement of all units in operating SIMRS is key to its success.

The integration function of SIMRS with the national health insurance system (BPJS) illustrates how technology can simplify the claims process and accelerate the flow of service funds. This is especially important for the operational sustainability of hospitals where most patients are insured under the national scheme (JKN). However, close synchronization between service input and the claims system is still required to avoid data errors that could result in claim rejections or delayed payments.

Furthermore, the findings show that SIMRS has not yet fully supported clinical decision-making (Clinical Decision Support System). Although electronic medical records are available, there is still no automated recommendation system to assist doctors in determining diagnoses or medical procedures. There is great potential for development in this area, especially if hospital data is processed more deeply using big data and artificial intelligence approaches.

In terms of human resources, a sustainable and participatory training approach is needed. Training should not only focus on technical system use but also on understanding the benefits of information systems in improving service quality. By enhancing this understanding, an organizational culture that is technology-oriented and responsive to innovation can emerge. It is also important to note that SIMRS optimization requires leadership support. The commitment of hospital leadership is a driving factor in providing resources, creating supportive policies, and overcoming internal resistance. Visionary leadership will view technology not as a burden, but as a long-term investment for improving service quality and organizational efficiency. From the patient's perspective, the presence of SIMRS impacts their

perception of professionalism and service speed. Patients feel more comfortable when their data is well-organized and services are streamlined. However, continuous public education is needed so that patients understand the digitalization process and can provide accurate personal data from the beginning of the service process. Considering these various aspects, it is clear that SIMRS is not just an administrative tool, but also a main pillar in the modern healthcare system. Proper implementation will generate a domino effect on service quality, cost efficiency, and hospital management transparency. Therefore, hospitals should position SIMRS development as a core part of their organizational strategy.

Overall, this discussion confirms that SIMRS holds great potential in supporting health service system reform. The challenges it faces are part of a transformation process that requires phased solutions and a systemic approach. With serious management commitment and the active participation of all hospital stakeholders, SIMRS optimization is not only possible but also an urgent necessity in meeting the increasingly complex demands of healthcare services.

CONCLUTION

Based on the research findings, it can be concluded that optimizing the Hospital Management Information System (HMIS) is crucial for enhancing hospital performance, as it serves as the backbone for managing essential data and information across medical services, administration, logistics, finance, and human resources. An integrated HMIS accelerates workflows, reduces data entry errors, and supports more efficient, data-driven decision-making, enabling hospital management to better meet patient needs and monitor service quality in real time. However, this optimization faces both technical and non-technical challenges, including infrastructure readiness, human resource competence, leadership commitment, and resistance to change among staff, which can hinder full integration and effective utilization. Addressing these issues requires ongoing training and the cultivation of an adaptive, participatory digital culture within the organization. Thus, HMIS optimization is not only a technological endeavor but also demands managerial transformation and organizational culture change. For future research, it is recommended to explore strategies for achieving full HMIS integration in resource-limited settings and to identify effective methods for overcoming non-technical barriers, such as staff resistance and organizational culture, to ensure sustainable digital transformation in hospitals.

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