

THE ROLE OF INFORMATION TECHNOLOGY UTILIZATION IN ENHANCING THE QUALITY AND EFFICIENCY OF HEALTHCARE ADMINISTRATION: A LITERATURE REVIEW

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Abstract

This study aims to examine the utilization of Health Information Technology (HIT) in improving the quality and efficiency of healthcare administration in Indonesia. Using a literature review method with a PRISMA approach, a total of 13 key publications were systematically analyzed. The findings indicate that the implementation of systems such as Electronic Medical Records (EMR), Hospital Management Information Systems (SIMRS), and e-Puskesmas significantly accelerates administrative processes, enhances data accuracy, and reduces the workload of healthcare personnel. The integration of digital systems has also been shown to reduce medication errors by up to 55% and expedite insurance claim processes by up to 70%. Despite existing challenges, including user resistance, limited infrastructure, and high implementation costs, empirical evidence suggests that the adoption of HIT represents a strategic step toward an efficient, transparent, and data-driven digital health transformation. Therefore, health information technology plays a vital role in strengthening governance, service quality, and the overall effectiveness of the national health system.

Keywords: Health Information Technology, Administrative Efficiency, Service Quality, Digital Transformation, Electronic Medical Records

INTRODUCTION

Environmental Environmental Over the past few decades, attention to the role of Health Information Technology (HIT) has increased significantly among healthcare professionals, policymakers, funding agencies, and the general public . Technologies such as Electronic Health Records (EHR) and Computerized Provider Order Entry (CPOE) are no longer viewed merely as technical innovations, but also as strategic instruments for transforming healthcare systems into more efficient, safe, and data-driven models. According to Bates and , the adoption of information technology represents a fundamental step in improving coordination and information accuracy within highly complex and fragmented healthcare environments. The ability to manage and distribute data accurately and in real time has become a key factor in enhancing both operational efficiency and service quality.

Traditional healthcare administration practices still face numerous limitations, particularly in terms of access speed, data accuracy, and coordination among service providers . Delays in recording and exchanging information may lead to serious clinical consequences, such as medication errors or duplicate diagnoses . In contrast, digital systems such as EHR enable faster, more transparent, and better-coordinated documentation, data exchange, and clinical decision-making processes. Paper-based systems, which have long dominated administrative practices, are increasingly considered inefficient. A systematic review by found that the use of EHR can reduce documentation time by up to 22.4% compared to manual systems, thereby significantly improving healthcare workforce efficiency. This finding is consistent with, which reported that EHR significantly accelerates information flow across hospital units and reduces unproductive administrative burdens. From a resource efficiency perspective, the integration of EHR systems allows healthcare providers to minimize redundant examinations and accelerate diagnostic processes. A report published in JAMA Network Open

indicated that EHR-based interventions reduced patient readmission rates by up to 17% within 30 days and 28% within 90 days compared to facilities still relying on manual systems . This reduction reflects improved efficiency in patient management and resource utilization within healthcare institutions. Furthermore, demonstrated that EHR facilitates faster data collection and patient screening processes in clinical research, thereby strengthening its role not only in service delivery but also in advancing medical knowledge.

From the perspective of service quality, health information technology supports the implementation of evidence-based practice. Through the integration of comprehensive clinical data, healthcare professionals are able to make decisions based on real-time information and up-to-date clinical guidelines. According to , Clinical Decision Support Systems (CDSS) integrated with EHR can reduce medication errors by up to 55%, particularly through automated alerts for drug interactions and dosage inaccuracies. Beyond patient safety, HIT also contributes to increased user satisfaction. A study by found that nurses trained in using CPOE reported improved work efficiency and more positive perceptions of patient safety. This suggests that the benefits of HIT extend beyond systemic improvements to include psychological and professional advantages, as users feel more confident and organized in performing their roles.

However, several challenges continue to hinder the full implementation of these technologies. According to , the primary barriers to EHR adoption include high initial costs, resistance to changes in work culture, limited training, and a lack of interoperability across platforms. These challenges are often more pronounced in developing countries, where digital infrastructure remains uneven and regulatory support is still limited [14]. In addition, inadequate system design and insufficient training may lead to workflow disruptions, potentially reducing efficiency and increasing user stress .

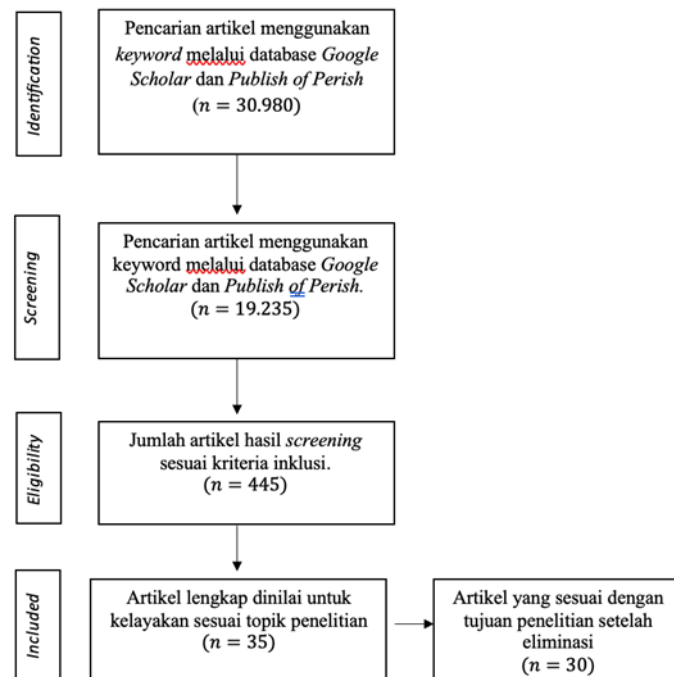
Despite these challenges, the growing body of scientific evidence indicates that when health information technology is implemented appropriately, it can simultaneously enhance both efficiency and service quality. Investment in health information systems should therefore be viewed not merely as a technological upgrade, but as a long-term strategy to build a responsive, integrated, high-quality, and efficient healthcare system that prioritizes patient safety and satisfaction. Accordingly, this study aims to analyze the quality and efficiency of technology utilization in healthcare, particularly in the field of administration.

RESEARCH METHODS

This study This study employs a literature review method to develop a comprehensive understanding through a systematic mapping review of selected studies. The literature selection and analysis process follows the PRISMA framework, as illustrated in Figure 1. This review was conducted in accordance with the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) .

Data sources were identified from databases such as Publish or Perish and Google Scholar, covering publications up to 2025. The search parameters included all possible pairwise combinations of keywords related to the utilization of information technology and the quality and efficiency of healthcare administration.

Gambar 1. PRISMA Literatur Review



The primary focus of this study is the quality and efficiency of technology in healthcare administration. To maintain a balanced scope that is both manageable and comprehensive, the researchers analyzed 13 key publications that specifically address these aspects. This number was considered sufficient to provide a broad overview of the relevant topic. To examine how each study highlights critical aspects of innovation, the researchers conducted a staged reading and analytical process to identify patterns, relationships, and their significance to the research theme (preliminary review).

This process also involved the systematic organization and categorization of the selected literature in terms of both quantity and quality, thereby facilitating the identification of research trends and core areas of focus. Relevant literature was obtained through keyword searches such as healthcare administration, health technology, and health administration, with sources drawn from previous journal publications and reputable databases, including Google Scholar. Furthermore, a data matrix was employed to evaluate the selected studies, incorporating specific information, key components of innovation, and research methodologies, enabling an in-depth analysis to address the research questions.

RESEARCH RESULTS

Based on the table above, the utilization of Information and Communication Technology (ICT) in healthcare administration in Indonesia demonstrates a growing trend toward improved efficiency and service quality. Several studies highlight the use of Hospital Management Information Systems (SIMRS), Electronic Medical Records (EMR), as well as application-based information systems for primary healthcare centers and patient referral services. For instance, Suriani reported that the implementation of SIMRS reduced patient registration time from 15 minutes to 5 minutes and minimized data duplication [19]. Similarly, Rinekasari and Ulfah (2024) found that the use of EMR accelerated BPJS claim processing from 7 days to 2 days, with a validity rate of up to 98%.

In addition, the implementation of the BPJS P-Care application in primary healthcare centers improved the efficiency of visit recording and routine reporting by up to 40% [21]. Cloud-based systems have also been shown to support registration management, billing, and reporting processes, leading to operational efficiency improvements of up to 30% and a 15% reduction in billing errors. The implementation of the e-Kohort system for maternal and child health data recording facilitates provincial data synchronization and accelerates monthly reporting processes. Several studies emphasize the role of EMR in enhancing administrative accuracy and effectiveness, including prescription documentation, medication validation, patient registration, and user satisfaction. The implementation of SIRANAP and e-Puskesmas has been shown to accelerate patient referrals and reduce report entry time from 2 hours to 30 minutes. Overall, the literature indicates that the adoption of ICT has a positive impact on time efficiency, data accuracy, and satisfaction among both patients and administrative staff. However, some studies also identify challenges, including limited infrastructure, insufficient digital literacy among healthcare personnel, and the need for stronger managerial support to optimize implementation.

These findings are consistent with national regulations promoting the digitalization of healthcare administration to improve service quality and operational efficiency, as outlined in the Regulation of the Minister of Health of the Republic of Indonesia Number 40 of 2017, and supported by literature on healthcare administration policy. The literature further emphasizes that ICT integration not only reduces administrative errors but also accelerates service delivery processes, supports epidemiological reporting, and enhances transparency in hospital management.

In conclusion, the utilization of ICT in healthcare administration has been proven to improve service quality, operational efficiency, and data accuracy. Nevertheless, its successful implementation requires adequate managerial support, workforce training, and technological infrastructure to ensure optimal outcomes.

DISCUSSION

Although the implementation of Health Information Technology (HIT) has been shown to improve administrative efficiency and quality, its effectiveness in practice is highly influenced by several key enabling factors. Based on the findings of the literature review, three main components play a crucial role in determining the success of digital transformation in healthcare administration: the appropriate utilization of information technology, the digital skills and literacy of healthcare personnel, and the availability of adequate infrastructure and digital networks. The factors influencing the efficiency of healthcare administration are as follows:

1. Implementation of Information Technology

The implementation of digital systems such as Hospital Management Information Systems (SIMRS), Electronic Medical Records (EMR), and e-Puskesmas constitutes the primary foundation for administrative efficiency across healthcare facilities in Indonesia. Studies indicate that the use of integrated information systems can reduce patient registration time by up to 60%, accelerate insurance claim processing from seven days to two days, and decrease administrative errors by up to 55%. System integration also enables real-time data communication across units, thereby improving service coordination and expediting administrative decision-making processes. Advanced technologies such as blockchain and Health Information Exchange (HIE) further enhance data security and archiving efficiency, while the implementation of cloud-based SIMRS facilitates faster inter-institutional data synchronization without reliance on local infrastructure. Therefore, the success of healthcare administrative

digitalization is largely determined by the alignment between the adopted technology and organizational needs, as well as system readiness to support efficient and transparent workflows.

2. Digital Skills and Literacy of Healthcare Personnel

Human resources represent a critical factor in ensuring the effective implementation of HIT. Studies reveal that low digital literacy and resistance to change remain significant challenges in many healthcare facilities, particularly in non-urban areas. Healthcare personnel who lack adequate training often encounter difficulties in navigating EMR and SIMRS systems, which may lead to data entry errors and reporting delays. Conversely, continuous technical training and strong managerial support have been shown to enhance user confidence, work efficiency, and administrative data accuracy. A study by mphasizes that leadership support and internal training policies can improve the effectiveness of EMR utilization by up to 25%. Thus, strengthening the digital competencies of healthcare personnel is a crucial investment to ensure the sustainability and effectiveness of digital transformation in healthcare administration.

3. Infrastructure and Digital Networks

The successful implementation of information technology is also highly dependent on the quality of supporting infrastructure and digital networks. Studies highlight that limitations in hardware, local servers, and internet network stability remain major barriers for healthcare facilities, particularly in rural areas. Network disruptions may result in data synchronization failures, reporting delays, and even the loss of critical patient information. Efforts to enhance infrastructure capacity through the adoption of cloud-based systems and the expansion of national internet networks are strategic measures to ensure the sustainability of digital healthcare services. In addition, the development of national platforms such as SATUSEHAT and SIRANAP contributes to strengthening data interoperability across institutions and ensuring efficient information exchange between service units. Reliable infrastructure and network availability are essential for optimizing digital system performance and maintaining consistent administrative efficiency across all levels of healthcare facilities.

Overall, these three factors—appropriate technology implementation, enhancement of healthcare personnel’s digital competencies, and strengthening of digital infrastructure—are closely interrelated in determining the effectiveness and efficiency of ICT-based healthcare administration in Indonesia. The success of digital transformation in this sector is not solely dependent on technological innovation, but also on the readiness of human resources and the supporting ecosystem to adapt to change toward more efficient, transparent, and sustainable healthcare services .

CONCLUSION

Based on the findings of the literature review, it can be concluded that the implementation of Health Information Technology (HIT) has a significant positive impact on improving the quality and efficiency of healthcare administration. This technology reduces unnecessary utilization of medical services, lowers operational costs, and accelerates administrative processes through automation and data integration. Systems such as Computerized Provider Order Entry (CPOE) and clinical decision support systems not only enhance the accuracy and speed of decision-making but also improve healthcare workflows and documentation practices. Although the initial stage of implementation requires adjustments in terms of time and user competencies, long-term outcomes demonstrate substantial improvements in administrative efficiency and service quality [31]. Therefore, HIT plays a

strategic role in supporting the digital transformation of healthcare services toward a more effective, efficient, and quality-oriented system.

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