Jurnal Impresi Indonesia (JII)
p-ISSN: 2828-1284 e-ISSN: 2810-062x
website: https: //rivierapublishing.id/jii/index.php/
Vol.5. No.2. 2026

Utilization of Artificial Intelligence in Government Hospital Information Systems: A Systematic Review

Isnina Eva Hidayati*, Sofian Lusa, Iindra Iriyanti, Nurcholis Ramlan, Dana Indra Sensuse
Universitas Indonesia, Indonesia
Email: isnina.eva@ui.ac.id*, sofian.lusa12@ui.ac.id, iindra.iriyanti@office.ui.ac.id, nurcholis.ramlan@ui.ac.id, dana@cs.ui.ac.id

Keywords
Artificial intelligence; digitalization; government hospital; hospital information systems; implementation

Abstract
The use of Artificial Intelligence (AI) in healthcare continues to expand. Hospital Information Systems (HIS) play a crucial role in managing clinical and operational data within hospitals. With advancements in technology, the integration of AI into HIS is gaining increasing attention due to its potential to enhance efficiency, accuracy, and the overall quality of healthcare services. Currently, government hospitals face various challenges in delivering public health services, including lengthy administrative processes, limited medical personnel, and the growing need for faster, data-driven clinical decision-making. This study focuses on analyzing the role of AI in supporting HIS development in government hospitals, with the objective of improving efficiency, accuracy, and service quality. Using a Systematic Literature Review (SLR) approach, the study collects, evaluates, and analyzes recent literature on the application of AI within HIS in government hospitals, particularly in areas such as patient registration, diagnostic support, electronic medical record management, and digital triage systems. The expected outcome of this study is a more comprehensive understanding of how AI can improve hospital operational efficiency while enhancing the quality of patient experiences, especially within public healthcare contexts. In addition, the study identifies key challenges in implementing AI within HIS, including limited system interoperability, the need for stronger health data security and regulatory frameworks, and insufficient human resource readiness. Therefore, this research is expected to provide meaningful contributions to policymakers, system developers, and government hospitals in designing digital transformation strategies for public health services that are smarter, safer, and more patient-oriented.

INTRODUCTION

Digital transformation has penetrated all sectors of life, and the health sector is no exception. In an era characterized by an explosion of data and increasing demand for fast, precise, and personalized services, hospitals—being the vanguard of healthcare—are required to adapt. One of the most frequent and persistent issues patients complain about is long waiting times and confusion in determining which polyclinic or doctor best suits their symptoms (Granqvist et al., 2022). This condition underscores the urgency for technological innovations that are not only reactive but also proactive, adaptive, and intelligent.

In this context, Artificial Intelligence (AI) is not merely an emerging technology but an innovative solution to support healthcare service activities. AI has several capabilities, such as recognizing patterns, making predictions, and assisting in the verification and classification of patients based on their symptoms. AI technology also plays an important role in prioritizing patients according to their level of urgency (triage) and aligning this with available healthcare resources. In acute care settings, the integration of AI has been shown to accelerate clinical decision-making by healthcare professionals, improve accuracy in intensive patient care management, and reduce risks such as medical errors through real-time data analysis.

The urgency of this research is indisputable. In many developing countries, including Indonesia, government hospitals handle a much larger patient load than private hospitals but operate with fewer health personnel and limited equipment. The Ministry of Health of the Republic of Indonesia (2023), through its latest health legislation, has explicitly encouraged the digital transformation of healthcare services. Unfortunately, this policy is not yet supported by a clear technical roadmap specifying how AI should be integrated into Sistem Informasi Rumah Sakit (SIRS). As a result, many AI pilot projects have proven unsustainable or failed to scale, largely because they were not designed with the complexities of government hospital organizations in mind.

As widely recognized, the development of mobile health (mHealth) during the COVID-19 pandemic highlighted the crucial role of digital technologies in supporting patient health monitoring, community health education and promotion, and the integration of remote services such as telemedicine , . This realization emphasizes the need for Hospital Information Systems (HIS) to adapt and interconnect with evolving mHealth and telehealth platforms to provide more comprehensive, real-time patient data , , . This suggests that AI-based HIS are not only vital for improving hospitals' internal efficiency but also hold great potential for expanding service accessibility and enhancing the overall patient experience across all healthcare facilities.

While a significant body of research has examined the application of AI in healthcare broadly, there remains a substantial gap in understanding how to effectively and efficiently integrate AI technologies into Hospital Information Systems (HIS), particularly within government hospitals. To address this gap, this study employs a Systematic Literature Review (SLR) approach to identify trends, challenges, and the tangible contributions of AI in supporting HIS in government hospitals. Specifically, it aims to analyze how AI can enhance efficiency, accuracy, and service quality while also evaluating the barriers that hinder its implementation.

This study is expected to contribute from three key perspectives. From a theoretical perspective, it enriches the body of knowledge on AI applications in hospital information systems while advancing the broader literature on digital health transformation , . From a practical perspective, it offers a reference framework for hospitals seeking to design and develop smarter, more efficient, and user-centered HIS , . From a social perspective, it aims to improve accessibility, convenience, and the quality of patient-centered healthcare services . Based on these objectives, this study focuses on addressing two main research questions:

RQ1: How is Artificial Intelligence (AI) utilized, and what role does it play in supporting the core functions of Hospital Information Systems (HIS) in government hospitals?

RQ2: What are the key challenges and success factors in implementing AI within HIS in government hospitals?

METHOD

This study utilized the Systematic Literature Review (SLR) method with the PRISMA 2020 framework (Page et al., 2021). There are three phases in SLR process in PRISMA, namely planning, implementation and reporting, as shown in Figure 2. In figure 2, every phase consists of several steps that will be explained in detail in the following sections.

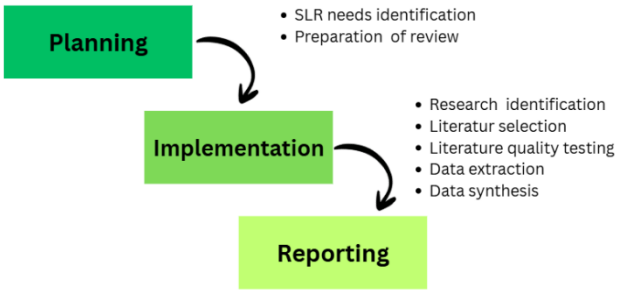

Figure 2. SLR Process

Planning

During the planning phase, researchers carried out three main steps: identifying literature sources; defining keywords; and establishing selection criteria. The first step we took was to determine the literature sources. We used five data sources which are Scopus, IEEE Xplore, ProQuest, Science Direct, Taylor and Francis. The next step was developed the keywords used in literature search with the devised search string: (“Artificial Intelligence”) AND (“Government Hospital” OR “Public Hospital”) AND (“Application” OR “Information Systems”) AND (“Digitalization” OR “Utilization” OR “Implementation”). The final step in the planning process was to establish the selection criteria, which defined the inclusion/exclusion criteria. Subsequently, we determined the quality assessment criteria by formulating relevant research questions. These two mechanisms are presented in Table 1.

Table 1. SLR Inclusion, Exclusion, and Quality Assesment

Mechanism	Description
Inclusion	Articles published between 2020-2025 and open access only, articles written in English, article type "conference" OR "journal", article subject area is "computer science" OR "Information technology" OR "artificial intelligence", articles focus on key of utilization and implementation of artificial intelligence.
Exclusion	Written in non-English, the paper cannot be accessed, as Systematic

Mechanism	Description
	Literature Review Paper, duplicated paper and private sector article.
Quality Assessment Criteria	• Are the research objectives clearly explained? • Is the AI method used explained (algorithm, framework, architecture)? • Is the research directly related to AI in hospitals/health information systems? • Does the research address efficiency (e.g. reducing diagnosis time, speeding up service)? • Does the research assess accuracy (e.g. more precise disease detection)? • Does the research touch upon the quality of patient care? • Does the research provide new contributions (models, frameworks, implementation recommendations)? • Are there any practical implications for government hospitals/public health services? • Did the research identify implementation challenges (ethics, data privacy, human resource limitations, system integration)?

Implementation

During the identification stage, a comprehensive literature search was conducted using five major scientific databases, namely IEEE Xplore, Scopus, SpringerLink, ScienceDirect, and ProQuest. Based on the search strategy established in the planning stage, 812 initial articles were found that contained relevant keywords such as 'Artificial Intelligence,' 'Hospital Information System,' 'Public Sector,' and 'Healthcare Digitalization.' This process was designed to ensure that the search results covered various perspectives, including technology, policy, and hospital information system implementation.

After the initial identification process, a screening stage was conducted to ensure that only articles that met the inclusion criteria would be analyzed further. The screening was carried out through three systematic stages, as shown in Figure 3, which illustrates the flow of article reduction from the initial results to the selected studies.

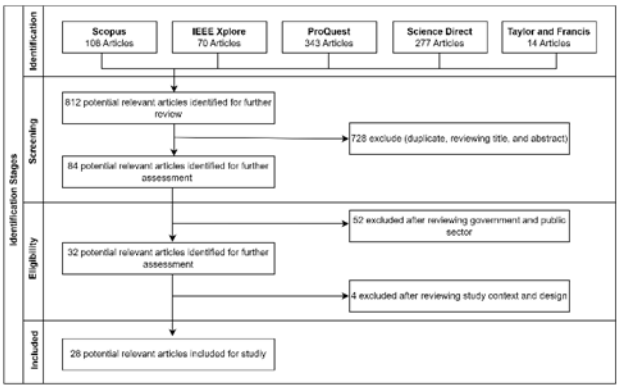

Figure 3. Primary Studies Selection Process

In the first stage, we screened articles related to the use of Artificial Intelligence in the health sector by reading the titles and abstracts obtained from five literature sources. At this stage, we eliminated 728 articles and produced 84 articles for further screening. In the second stage, we screened articles focusing on government or public hospitals and eliminated 52 articles, leaving 32 articles to be read in their entirety. The 32 articles were screened based on quality assessment criteria established during the planning process. We gave a score of 1 if the criteria were met, a score of 0.5 if the criteria were moderately met, and 0 if they were not met. From this assessment, we obtained 28 studies as selected articles that had a minimum score of 4 from Scopus, IEEE Xplore, ProQuest, Science Direct, and Taylor and Francis, as shown in Table 2.

Table 2. Selected Articles From Qualitty Assesment Result

No	Source	Article	otal
1	Scopus	(Blandford et al., 2025; Christopherjames et al., 2021; Granqvist et al., 2022), (Burle et al., 2025; Durchon et al., 2022; El-Sherif & Abouzid, 2022; Haase et al., 2024; Kurolov & Esanova, 2025; Liu et al., 2024; Ramalingam & Ganesan, 2023; Sreedhar Kumar et al., 2024; Yuvarajan et al., 2025)	2
2	IEEE Xplore	(Gurupur & Shelleh, 2021; J. Blandford, 2023;	

No	Source	Article	otal
		Kopka et al., 2025; Shinde et al., 2021; Stausberg et al., 2025; Wang, 2021)	
3	ProQuest	(Ivanovic et al., 2023; Pham et al., 2024; Tamizharasi et al., 2021)	
4	ence Direct	(Born et al., 2024; Farzanegan et al., 2025; Kong, 2021; Lina Weinert, 2022; Suha & Sanam, 2023; Wei et al., 2023)	
5	Taylor and Francis	(Caroline Bönisch, 2025)	
Total			**8**

Primary research was conducted by extracting and synthesizing data from 28 key articles that had passed the quality assessment stage in accordance with the planning strategy set out in the Systematic Literature Review (SLR) methodology. These articles were selected through a multi-layered screening process, including an assessment of relevance, methodological completeness, and contribution to the topic of artificial intelligence (AI) application in Hospital Information Systems (HIS) in the government sector. The review of these 28 articles covers publications published between 2020 and September 2025, as listed in Table I as a list of articles that meet the inclusion criteria. Figure 4 shows the distribution of articles based on the year of publication of the research and provides a visual depiction of the trends in related research conducted over the past five years.

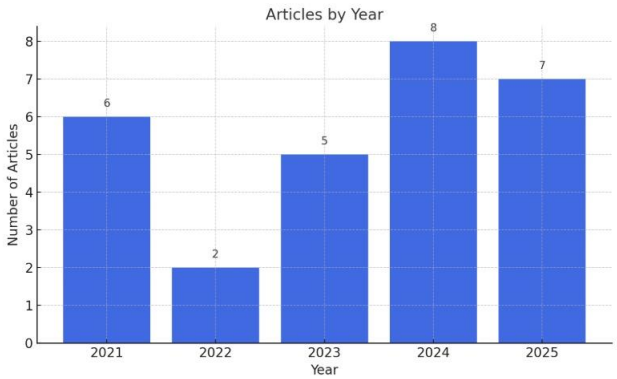

Figure 4. Articles by Year

The research data extraction process was conducted systematically. We reviewed the title, abstract, research objectives, methods, and results of each selected article. This analysis aimed to identify how artificial intelligence (AI) is used in Hospital Information Systems (HIS), particularly in the context of government hospitals. At this stage, each article is reviewed to determine the patterns used in the application of AI technology, the objectives of its implementation, and its impact of AI on operational efficiency, clinical accuracy, and healthcare service management in each healthcare facility. Therefore, the extraction process not only collected raw data but also comprehensively combined it to understand trends, challenges, and the contribution of previous studied research to the development of AI-based HIS in hospital.

Reporting

The findings in this review section are presented systematically to provide a comprehensive overview of the application of Artificial Intelligence (AI) in Hospital Information Systems (HIS). The analysis covers the level of AI implementation, technical and organizational challenges, key achievements, and implications for digital health service governance. The study results demonstrate that the implementation of AI technology has significantly contributed to improvements in operational efficiency, clinical accuracy, and patient experience in helathcare facilities. Overall, these findings confirm that AI integration is an important element in the digital transformation of government hospitals towards smarter and more sustainable healthcare services.

RESULTS AND DISCUSSION

In this study, we used thematic analysis to analyze the literature data. From the 28 selected papers, we conducted an open coding process to identify patterns, concepts, or themes from the collected literature. This process resulted in the identification of themes or patterns of meaning relevant to the use of AI in Government Hospital Information Systems. The indicators used for open coding in thematic analysis were derived from the research questions of this study, namely:

How is Artificial Intelligence (AI) utilized and what role does it play in supporting the core functions of Hospital Information Systems (HIS) in government hospitals?

Based on RQ1, we classified three indicators that affect the use of AI in supporting HIS in government hospitals. The main themes identified from the 28 papers, based on these indicators, are presented in Table 3. In table 3, we provide a detailed description of each theme identified under each indicator, accompanied by its corresponding references.

Table 3. Main Themes Identified of RQ1

Indicators	Description	Reference
The role of AI in optimizing the core functions of HIS		
Triage	AI has the capability to classify patient disease symptoms and support the initial triage process.	(Born et al., 2024; Christopherj ames et al., 2021; Kong, 2021; Liu et al., 2024;

Indicators	Description	Reference
		Ramalingam & Ganesan, 2023; Tamizharasi et al., 2021; Wang, 2021; Wei et al., 2023)
Clinical decision support	AI supports clinical decision-making Related to physician recommendations and clinical follow-up, Including initial therapy, diagnosis, and treatment based on clinical data, recommendations and clinical follow-up, including initial therapy, diagnosis, and treatment based on clinical data.	(Born et al., 2024; Burle et al., 2025; Caroline Bönisch, 2025; Christopherjames et al., 2021; Liu et al., 2024; Pham et al., 2024; Suha & Sanam, 2023; Tamizharasi et al., 2021; Wei et al., 2023)
Medical Records	AI enhances the quality of electronic medical records by enabling the integration of patient history, laboratory results, medication information, and triage data.	(Born et al., 2024; Caroline Bönisch, 2025; Christopherjames et al., 2021; Lina Weinert, 2022; Liu et al., 2024; Pham et al., 2024; Wang, 2021; Wei et al., 2023; Yuvarajan et al., 2025)
1. The utilization of AI for enhancing HIS		
Patient Registration and Administration	AI has the potential to optimize patient registration and administrative functions by	(Born et al., 2024; Christopherjames et al., 2021; Farzanegan

Indicators	Description	Reference
	improving the efficiency of registration workflows through online systems, enhancing patient data management for faster and more accurate retrieval, enabling automated appointment scheduling, and facilitating HIS data integration, thereby accelerating administrative services.	et al., 2025; Lina Weinert, 2022; Liu et al., 2024; Pham et al., 2024; Wei et al., 2023; Yuvarajan et al., 2025)
Prediction and Monitoring	AI contributes to healthcare services by detecting common symptoms, predicting potential diseases from patient-reported inputs, generating preliminary diagnostic recommendations, and enabling continuous monitoring patient conditions.	(Born et al., 2024; Caroline Bönisch, 2025; Christopher james et al., 2021; El-Sherif & Abouzid, 2022; Farzanegan et al., 2025; Haase et al., 2024; Kong, 2021; Pham et al., 2024; Suha & Sanam, 2023; Tamizharasi et al., 2021; Wang, 2021; Wei et al., 2023; Yuvarajan et al., 2025)
Patient Safety and Security	Data-driven AI facilitates early	(Alathamneh et al.,

Indicators	Description	Reference
	disease detection based on patient symptoms and improves triage accuracy, thus supporting evidence-based clinical decision-making while reducing the risk of medical errors and strengthening patient safety.	2024; Born et al., 2024; Caroline Bönisch, 2025; Durchon et al., 2022; El-Sherif & Abouzid, 2022; Farzanegan et al., 2025; Ramalingam & Ganesan, 2023; Suha & Sanam, 2023; Wang, 2021; Wei et al., 2023)
Patient Comfort and Experience	AI facilitates patient access to information through transparent chatbot interactions, enables observation of initial disease symptoms, and provides rapid responses via patient portals by reducing hospital queues and minimizing waiting times, AI has the potential to improve efficiency and enhance patient satisfaction, thereby contributing to better comfort and	(Born et al., 2024; Caroline Bönisch, 2025; Christopherjames et al., 2021; Farzanegan et al., 2025; Haase et al., 2024; Kong, 2021; Kurolov & Esanova, 2025; Liu et al., 2024; Pham et al., 2024; Tamizharasi et al., 2021; Wei et al., 2023; Yuvarajan et al., 2025)

Indicators	Description	Reference
	overall patient experience.	
3. Evaluating the impact of AI on HIS in government hospitals		
Operational Efficiency Enhancement	Faster registration and triage, more efficient administration, automated patient data entry, and automated scheduling reduce hospital queues and enhance the operational efficiency of hospitals.	[2], [3], [5], [7], [13], [15], [16], [18], [20], [21], [24], [25], [27], [29], [31]
AI-Driven Improvement in Clinical Decision-Making Quality	Data-driven decision support for diagnosis and therapy, disease Prediction based on symptoms, as well as recommendations for physicians and initial by complete and accurate data.	(Alathamneh et al., 2024; Blandford et al., 2025; Born et al., 2024; Caroline Bönisch, 2025; Durchon et al., 2022; El-Sherif & Abouzid, 2022; Kopka et al., 2025; Lina Weinert, 2022; Liu et al., 2024; Pham et al., 2024; Suha & Sanam, 2023; Wang, 2021; Yuvarajan et al., 2025)
Data Security and Patient Privacy	There may be risks to data security across systems due to low interoperability; therefore, patient data privacy must be	(Alathamneh et al., 2024; Blandford et al., 2025; Born et al., 2024; El-Sherif &

Indicators	Description	Reference
	safeguarded through enhanced device security, secure data integration, and regulatory protection.	Abouzid, 2022; Farzanegan et al., 2025; Kopka et al., 2025; Kurolov & Esanova, 2025; Pham et al., 2024; Shinde et al., 2021; Suha & Sanam, 2023)
Enhancement of patient Satisfaction	Easier access to services, faster service delivery, more personalized interactions, the ability for patients to receive a preliminary diagnosis before consulting a physician, and greater ease in selecting healthcare facilities, all of which reduce waiting times and enhance patient satisfaction.	(Alathamneh et al., 2024; Blandford et al., 2025; Born et al., 2024; Christopherjames et al., 2021; El-Sherif & Abouzid, 2022; Farzanegan et al., 2025; Kong, 2021; Kopka et al., 2025; Kurolov & Esanova, 2025; Lina Weinert, 2022; Liu et al., 2024; Shinde et al., 2021; Suha & Sanam, 2023; Wang, 2021; Wei et al., 2023; Yuvarajan et al., 2025)

What are the challenges and key success factors in implementing Artificial Intelligence in Hospital Information Systems (HIS) in government hospitals?

Based on RQ2, we classified five indicators that consist of barriers, challenges, critical success factors for the use of AI in supporting HIS in government hospitals and strategies for implementing AI in HIS. The main themes identified from the 28 papers, based on these indicators, are presented in Table 4. We provide a description of each theme identified under each indicator, accompanied by its corresponding references in table 4.

Table 4. Main Themes Identified of RQ2

Indicators	Description	References
1. Technical Barriers		
Data	Inconsistent and incomplete data quality poses a major barrier, reducing the reliability and accuracy of AI models	(Alathamneh et al., 2024; Haase et al., 2024; Kopka et al., 2025)
Integration	Limited interoperability among HIS, EHR, mHealth, and telehealth systems creates barriers to real-time data exchange and coordinated care.	
Reliability of AI Models	AI model validity is still constrained when applied to complex clinical conditions, and the risk of bias persists if the underlying data is unstructured or of poor quality.	(Blandford et al., 2025; Pham et al., 2024; Stausberg et al., 2025; Tamizharasi et al., 2021; Wang, 2021; Wei et al., 2023; Yuvarajan et al., 2025)
2. Organizational and Workforce Challenges		
Management Support	Successful AI adoption depends on strong management commitment, encompassing adequate investment and the formulation of strategic policies.	(Alathamneh et al., 2024; Blandford et al., 2025; El-Sherif & Abouzid, 2022)
Medical Staff Readiness	The readiness of medical staff is low due to limited training and concerns about	

Indicators	Description	References
	losing clinical autonomy.	
Resistance	User resistance is primarily driven by a lack of trust in automated systems and the perceived burden of adapting to new technological workflows.	
3. Challenges Related to Regulation, Ethics, and Data Security		
Regulation	Key issues include patient privacy concerns, potential data breaches, and insufficient local regulatory frameworks for medical data security.	(Burle et al., 2025; El-Sherif & Abouzid, 2022; Liu et al., 2024)
Ethics	Ethical challenges include algorithmic bias, decision-making, transparency, and legal accountability.	
Data Security	Government hospitals encounter significant difficulties in achieving compliance with international data security standards.	
4. Critical Success Factors for AI Adoption in HIS		
Efficiency	The implementation of AI improves operational efficiency through shorter waiting times, faster triage processes, and more effective resource allocation.	(Burle et al., 2025; Durchon et al., 2022; El-Sherif & Abouzid, 2022; Haase et al., 2024; Ramalingam & Ganesan, 2023; Sreedhar Kumar et al., 2024)
Quality of Healthcare Services	The enhancement of healthcare service quality is evidenced by increased diagnostic accuracy and decreased incidence of medical errors.	
Patient Satisfaction	Enhanced patient satisfaction is achieved through faster, personalized,	

Indicators	Description	References
	and more accessible services via telehealth and mHealth. Effective governance, encompassing national strategies, sustainable investment, and clear regulatory frameworks, is a critical success factor.	
5. Strategies for Implementing AI in HIS in the Public Sector		
Data and Format Standardization	The implementation of standardized medical data and data formats enables the improvement of data input quality through mechanisms such as automated validation and natural language processing (NLP)-based data cleaning, which in turn enhances the reliability and completeness of patient data	(Caroline Bönisch, 2025; Kong, 2021; Kopka et al., 2025; Pham et al., 2024; Shinde et al., 2021; Suha & Sanam, 2023; Wang, 2021; Yuvarajan et al., 2025)
Enhancing HIS Interoperability	Enhancing HIS Interoperability by adopting an open architecture that enables the connection between AI systems and legacy HIS through standard APIs and middleware.	(Blandford et al., 2025; Caroline Bönisch, 2025; El-Sherif & Abouzid, 2022; Lina Weinert, 2022; Liu et al., 2024; Pham et al., 2024; Tamizharasi et al., 2021)
Validation of AI models using real-world data	Validation of models with real and larger, more accurate datasets (rather than solely test or simulated data) is enhance decision-making transparency, thereby generating more reliable recommendations.	(Caroline Bönisch, 2025; Kopka et al., 2025; Lina Weinert, 2022; Shinde et al., 2021; Stausberg et al., 2025; Suha & Sanam, 2023; Wei et al., 2023)

Indicators	Description	References
Capacity building and training programs for medical staff on the effective use of AI-integrated HIS	Training programs for medical and administrative staff to interpret AI outputs should involve IT decision makers from the early stages of adoption and promote multi-disciplinary collaboration (physicians, data scientists, and IT specialists). training should be implemented as part of mentoring and change management programs to reduce resistance. In addition, digital literacy campaigns for patients are necessary to facilitate the adoption of chatbots and patient portals.	(Blandford et al., 2025; Born et al., 2024; Farzanegan et al., 2025; Kong, 2021; Liu et al., 2024; Pham et al., 2024; Suha & Sanam, 2023; Tamizharasi et al., 2021)

From Tables III and IV, several key aspects influencing the utilization of AI in government hospital information systems can be generalized—namely, AI's role in supporting hospital business processes, enhancing operational efficiency, improving patient comfort, and strengthening the quality of clinical decision-making. In addition, the tables highlight the barriers and challenges associated with AI implementation in HIS, stemming from both internal factors—such as technical and organizational issues—and external factors, including regulations and policies. They also identify critical factors influencing the adoption of AI into HIS and outline corresponding implementation strategies.

The results of this systematic review indicate that the application of AI in government Hospital Information Systems has substantial potential to improve operational efficiency, clinical accuracy, and patient experience. Findings from the 28 articles analyzed reveal four primary areas of AI utilization: patient registration, clinical diagnostic support, electronic medical record management, and digital triage systems. However, further analysis shows that successful AI implementation depends not only on technological capability but also on organizational readiness, governance frameworks, and social context.

Moreover, the results of this literature synthesis can be classified into four major aspects: technical, organizational and human resource, regulatory, and implementation success factors. The following section provides a detailed explanation of each:

1. Technical Aspects

   The main challenges on the technical side include inconsistent data quality, limited integration between systems (HIS, EHR, mHealth, telehealth), and uneven IT infrastructure in government hospitals. These conditions limit the reliability of AI models and the ability to exchange data in real time.
2. Organizational and Human Resource Aspects

   The implementation of AI requires strong management support, the availability of medical personnel who are ready to use new technology, and ongoing training programmed. Resistance from healthcare workers often arises due to concerns about losing clinical autonomy or an increased workload due to adapting to new systems.
3. Regulatory, Ethical, and Data Security Aspects

   The greatest concerns are patient data security, algorithm transparency, and potential bias in clinical decision-making. The national regulatory framework regarding data privacy and security still needs to be strengthened to align with international standards.
4. Success Factors.

   Key factors supporting the successful implementation of AI in HIS include increased administrative efficiency (faster registration and triage), improved diagnostic accuracy, patient satisfaction through personalized services, and good digital governance.

Thus, this discussion emphasizes that the use of AI in HIS cannot be viewed solely as a technological innovation, but rather as part of the digital transformation of government hospitals that requires comprehensive support in terms of infrastructure, policy and human resource readiness. This implies that organizational change management, continuous staff training, and the development of clear regulatory frameworks should be accompanied the integration of AI into HIS to ensure successful implementation. Moreover, to align AI initiatives with healthcare objectives and public service values, collaboration among policymakers, hospital administrators, and technology providers becomes essential.

CONCLUSION

The utilization of Artificial Intelligence (AI) within Health Information Systems (HIS) in government hospitals has shown promising potential, playing significant roles in patient registration, triage, clinical diagnosis support, and electronic medical record management. However, several challenges remain, including inconsistent data quality, limited system integration, inadequate IT infrastructure, and insufficient human resource and management support. Moreover, regulatory and ethical concerns—such as patient data privacy, information security, and algorithmic bias—pose serious obstacles that require careful attention. The key success factors for implementing AI in HIS include enhancing operational efficiency, improving service quality, increasing patient satisfaction, and strengthening digital health governance. To ensure the sustainability and effectiveness of AI integration in public health services, it is essential to focus on reinforcing IT infrastructure, building human resource

capacity, establishing clear regulations for data security and ethics, and promoting multi-stakeholder collaboration among government, academia, and industry. By addressing these factors, the effectiveness and efficiency of AI utilization in HIS can be significantly improved.

REFERENCES

Alathamneh, R., Ameri, S. Al, & Obeidat, F. Al. (2024). Artificial Intelligence in Mental Health Care: The T5 Chatbot Project. *International Conference on Social Networks Analysis, Management and Security, SNAMS*, (2024), 212–218. https://doi.org/10.1109/SNAMS64316.2024.10883804

Blandford, A., Bindman, J., Bradbury, K., Cooper, B., Costanza, E., Edwards, S., Hamilton, F., Heightman, M., Hurst, J. R., Hylton, H., Linke, S., Pfeffer, P., Ricketts, W., Robson, C., Stevenson, F., Sunkersing, D., Waywell, J., & Goodfellow, H. (2025). Experiences of User-Centred Design with Agile Development for Clinically Supported Self-Management of Long COVID. *ACM Transactions on Computer-Human Interaction*, *32*(1). https://doi.org/10.1145/3711839

Born, C., Wildmoser, J., Schwarz, R., Bottcher, T., Hein, A., & Krcmar, H. (2024). Identifying potentials for Artificial Intelligence-based process support along the emergency department care pathway to alleviate overcrowding. *Procedia Computer Science*, *239*, 1705–1712. https://doi.org/10.1016/j.procs.2024.06.348

Burle, R., Gundewar, S., Gaurkhede, S., & Fulkar, B. (2025). Conversational Symptom Checker Chatbot for Disease Prediction and Suggesting Nearby Hospitals using Machine Learning and Location Services. *3rd International Conference on Electronics and Renewable Systems, ICEARS 2025 - Proceedings*, 775–780. https://doi.org/10.1109/ICEARS64219.2025.10941338

Caroline Bönisch, C. S. D. K. H. A. K. T. K. (2025). Proposal for Using AI to Assess Clinical Data Integrity and Generate Metadata: Algorithm Development and Validation. *JMIR Medical Informatics*,.

Christopherjames, J. E., Saravanan, M., Thiyam, D. B., Prasath Alias Surendhar, S., Sahib, M. Y. B., Ganapathi, M. V., & Milton, A. (2021). Natural Language Processing based Human Assistive Health Conversational Agent for Multi-Users. *Proceedings of the 2nd International Conference on Electronics and Sustainable Communication Systems, ICESC 2021*, 1414–1420. https://doi.org/10.1109/ICESC51422.2021.9532913

Durchon, C., Vanderlan, S., Jegard, A., Saram, H., Falchi, M., Campeotto, F., Dupic, L., Burgun, A., Vivien, B., & Tsopra, R. (2022). An Interactive Interface for Displaying Recommendations on Emergency Phone Triage in Pediatrics. *Studies in Health Technology and Informatics*, *294*, 430–434. https://doi.org/10.3233/SHTI220495

El-Sherif, D. M., & Abouzid, M. (2022). Analysis of mHealth research: mapping the relationship between mobile apps technology and healthcare during COVID-19 outbreak. In *Globalization and Health* (Vol. 18, Number 1). BioMed Central Ltd. https://doi.org/10.1186/s12992-022-00856-y

Farzanegan, F., Sepehri, M. M., Samani, M. R. G., & Barati, L. (2025). Integrating artificial intelligence and optimization tools in bed assignment to enhance patient satisfaction under uncertainty. *Engineering Applications of Artificial Intelligence*, *159*. https://doi.org/10.1016/j.engappai.2025.111363

Granqvist, K., Ahlstrom, L., Karlsson, J., Lytsy, B., & Andersson, A. E. (2022). Learning to interact with new technology: Health care workers' experiences of using a monitoring system for assessing hand hygiene – a grounded theory study. *American Journal of Infection Control*, *50*(6), 651–656. https://doi.org/10.1016/j.ajic.2021.09.023

Gurupur, V. P., & Shelleh, M. (2021). Machine Learning Analysis for Data Incompleteness (MADI): Analyzing the Data Completeness of Patient Records Using a Random Variable Approach to Predict the Incompleteness of Electronic Health Records. *IEEE Access*, *9*, 95994–96001. https://doi.org/10.1109/ACCESS.2021.3095240

Haase, L., Monett, D., & Sedlmayr, M. (2024). Horse Diagnosis and Triage Accuracy of GPT-4o. *Studies in Health Technology and Informatics*, *321*, 200–204. https://doi.org/10.3233/SHTI241092

Ivanovic, M., Autexier, S., Kokkonidis, M., & Rust, J. (2023). Quality medical data management within an open AI architecture–cancer patients case. *Connection Science*, *35*(1). https://doi.org/10.1080/09540091.2023.2194581

J. Blandford, A. C. and T. R. (2023). *Patient experience and digital health innovation in hospitals: Challenges and opportunities*.

Kong, L. (2021). A study on the AI-based online triage model for hospitals in sustainable smart city. *Future Generation Computer Systems*, *125*, 59–70. https://doi.org/10.1016/j.future.2021.06.023

Kopka, M., von Kalckreuth, N., & Feufel, M. A. (2025). Accuracy of online symptom assessment applications, large language models, and laypeople for self–triage decisions. *Npj Digital Medicine*, *8*(1). https://doi.org/10.1038/s41746-025-01566-6

Kurolov, M. O., & Esanova, S. (2025). Knowledge Based Systems in Digital Healthcare Marketing for Improved Patient Engagement. *ACM International Conference Proceeding Series*, 846–850. https://doi.org/10.1145/3726122.3726244

Lina Weinert, J. M. L. S. O. H. (2022). *Perspective of Information Technology Decision Makers on Factors Influencing Adoption and Implementation of Artificial Intelligence Technologies in 40 German Hospitals: Descriptive Analysis*.

Liu, X., Lai, R., Wu, C., Yan, C., Gan, Z., Yang, Y., Zeng, X., Liu, J., Liao, L., Lin, Y., Jing, H., & Zhang, W. (2024). Assessing the utility of artificial intelligence throughout the triage outpatients: a prospective randomized controlled clinical study. *Frontiers in Public Health*, *12*. https://doi.org/10.3389/fpubh.2024.1391906

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. In *The BMJ* (Vol. 372). BMJ Publishing Group. https://doi.org/10.1136/bmj.n71

Pham, J. H., Thongprayoon, C., Miao, J., Suppadungsuk, S., Koirala, P., Craici, I. M., & Cheungpasitporn, W. (2024). Large language model triaging of simulated nephrology patient inbox messages. *Frontiers in Artificial Intelligence*, *7*. https://doi.org/10.3389/frai.2024.1452469

Rachmani, E., Haikal, Pa, F. D., Setiono, O., Anjani, S., & Wulandari, F. (2023). Are the Citizens of Semarang ready for The Citizen Health App (SatuSehat Mobile)? A

Prediction Model from Decision Tree. *2023 International Seminar on Application for Technology of Information and Communication: Smart Technology Based on Industry 4.0: A New Way of Recovery from Global Pandemic and Global Economic Crisis, ISemantic 2023*, 475–479. https://doi.org/10.1109/iSemantic59612.2023.10295354

Ramalingam, J., & Ganesan, K. (2023). *Section A-Research paper Personal Healthcare Chatbot for Medical Suggestions Using Artificial Intelligence and Machine Learning Eur*. https://doi.org/10.31838/ecb/2023.12.s3.670

Shinde, N. V., Akhade, A., Bagad, P., Bhavsar, H., Wagh, S. K., & Kamble, A. (2021). Healthcare Chatbot System using Artificial Intelligence. *Proceedings of the 5th International Conference on Trends in Electronics and Informatics, ICOEI 2021*, 1174–1181. https://doi.org/10.1109/ICOEI51242.2021.9452902

Sreedhar Kumar, S., Ahmed, S. T., Fathima, A. S., Nishabai, M., & Sophia, S. (2024). Medical ChatBot Assistance for Primary Clinical Guidance using Machine Learning Techniques. *Procedia Computer Science*, *233*, 279–287. https://doi.org/10.1016/j.procs.2024.03.217

Stausberg, J., Harkener, S., Draeger, C., Jenetzky, E., Löbe, M., March, S., & Schubert, C. (2025). Quality of Data Sets in Empirical Health Research: The IDEFIM Framework. *Studies in Health Technology and Informatics*, *329*, 103–107. https://doi.org/10.3233/SHTI250810

Suha, S. A., & Sanam, T. F. (2023). Exploring dominant factors for ensuring the sustainability of utilizing artificial intelligence in healthcare decision making: An emerging country context. *International Journal of Information Management Data Insights*, *3*(1). https://doi.org/10.1016/j.jjimei.2023.100170

Tamizharasi, B., Jenila Livingston, L. M., & Rajkumar, S. (2021). Building a medical chatbot using support vector machine learning algorithm. *Journal of Physics: Conference Series*, *1716*(1). https://doi.org/10.1088/1742-6596/1716/1/012059

Wang, R. (2021). Application analysis of artificial intelligence in hospital. *2021 2nd International Conference on Artificial Intelligence and Computer Engineering (ICAICE)*, 143–148. https://doi.org/10.1109/ICAICE54393.2021.00036

Wei, Q., Wang, Y., Yao, Z., Cui, Y., Wei, B., Li, T., & Xu, X. (2023). Evaluation of ChatGPT's performance in providing treatment recommendations for pediatric diseases. *Pediatric Discovery*, *1*(3). https://doi.org/10.1002/pdi3.42

Yuvarajan, C., Priya, S. N., & Bhoomadevi, A. (2025). Designing a mobile health platform for effective medical records management in hospitals. *Discover Applied Sciences*, *7*(4). https://doi.org/10.1007/s42452-025-06777-w