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Analysis Of Digital Maturity Level (DMI) Based On The Ministry Of Health Instrument At ST. Carolus Hospital, Summarecon Serpong In 2026

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Abstract

Digital transformation requires hospitals to have an adequate level of digital maturity to support system integration, data security, and healthcare interoperability. This study aims to analyze the digital maturity level of St. Carolus Hospital Summarecon Serpong in 2026, identify gaps, and formulate improvement priorities based on the Ministry of Health's Digital Maturity Index (DMI) instrument. The study used a sequential explanatory design with quantitative and qualitative approaches. Eight informants were selected purposively. Instruments included DMI assessments, in-depth interviews, focus group discussions (FGDs), and observations. The data were analyzed descriptively using the average score of the seven DMI components and thematically through coding, categorization, and triangulation. The results showed the highest scores for Standards and Interoperability (4.67), Competence, Skills and Use (4.50), and Management and Governance (4.44). In conclusion, the hospital's digital maturity is at a high level, but there is still a need to strengthen data analytics, infrastructure, security, training, and RME interoperability.

Keywords: ***Digital Health, Digital Maturity, Electronic Health Records, Health Information Systems, Interoperability***

INTRODUCTION

The evolution of the healthcare sector in the Industry 5.0 era is driving the integration of digital technology with human-centered clinical processes. Hospitals globally are evolving towards Smart Hospitals through the use of Big Data, Artificial Intelligence, and the Internet of Medical Things (IoMT). Therefore, the success of this transformation is determined not only by technology but also by the organization's readiness to manage the digital ecosystem (Karrouk et al., 2025).

In Indonesia, digital transformation in healthcare has been formulated through the "2024 Health Digital Transformation Strategy Blueprint." The Ministry of Health, through its Digital Transformation Office (DTO), introduced the Digital Maturity Index as a tool to measure the digital maturity of healthcare facilities to support transformation and interoperability with SATUSEHAT. This readiness includes the digital capabilities of human resources and a flexible organizational culture (Nurfadhila et al., 2026).

Digital maturity issues are still found in hospitals in Indonesia. Research by Nugroho et al. (2024) shows that hardware availability does not guarantee increased digital maturity because governance and human resource capabilities remain obstacles. Setiawan (2025) also shows that failure to map the maturity index is correlated with failed data integration into SATUSEHAT, administrative sanctions, and service inefficiencies.

St. Carolus Hospital in Summarecon Serpong faces challenges to meet the Ministry of Health's interoperability standards while providing seamless digital services to patients. Despite ongoing technology investments, there has been no comprehensive evaluation using the Ministry of Health's Digital Maturity Index (DMI) standards to accurately assess the hospital's digital maturity.

The 2025 DMI measurement results show varying levels of achievement across seven components: information systems and infrastructure (3.58), standards and interoperability (2.67), IS management and resources (3.33), data analytics (2.17), competency, skills, and utilization (3.17), data security, privacy, and confidentiality (2.43), and electronic medical records (3.5). Overall, the hospital is at level 3, meeting minimum capabilities, so it is still necessary to identify aspects that are priority for improvement.

This study aims to analyze the level of digital readiness and maturity of St. Carolus Hospital Summarecon Serpong in 2026 using standard instruments of the Ministry of Health of the Republic of Indonesia, identify gaps and obstacles, and develop an improvement roadmap to support interoperability with SATUSEHAT. The urgency of this study lies in the need to provide a basis for data-based decision-making to determine priorities for IT development, budgeting, and service improvements. The novelty of this study lies in the application of the Ministry of Health's Digital Maturity Index to capture the digital maturity of St. Carolus Hospital Summarecon Serpong in 2026 while simultaneously formulating improvement strategies based on the hospital's actual conditions.

RESEARCH METHODS

This study employed a sequential explanatory design, conducted in stages through quantitative and qualitative approaches. The first stage involved a self-assessment using the Digital Maturity Index (DII) to obtain scores across seven dimensions of digital maturity. The second stage used in-depth interviews and observations to explain the factors underlying the quantitative results. This approach was used to gain a deeper contextual understanding of the statistical results (Ivankova & Creswell, 2024; Creswell & Creswell, 2023).

The study was conducted at St. Carolus Hospital Summarecon Serpong, located at Jl. Gading Golf Boulevard Kav. 08, Gading Serpong, Tangerang. The study was conducted from January to March 2026.

The research informants consisted of eight individuals: the Head of the Service Division, the Head of IT, the Medical Records Manager, Medical Records staff, outpatient and inpatient admissions, and inpatient and outpatient healthcare workers. Informants were selected based on their involvement and knowledge of the implementation of digital systems and Electronic Medical Records (EMR) in the hospital.

Data collection was conducted in two stages. The first stage involved collecting and compiling the results of the IKD self-assessment, followed by calculating the average across seven dimensions: Governance, People and Culture, Strategy, Infrastructure, Data, Services/Applications, and Interoperability. These scores were used to determine maturity levels on a scale of 1 to 5 and to identify dimensions requiring further study. The second stage involved in-depth interviews and field observations. Interviews were transcribed verbatim, and the data were then read repeatedly to understand the context and information provided by the informants.

Data analysis was conducted sequentially according to a sequential explanatory design. Quantitative data were analyzed descriptively by calculating the average score for each IKD dimension and determining the hospital's digital maturity level. Next, qualitative data were analyzed using thematic analysis through coding, categorization, and theme mapping based on the seven IKD dimensions. Qualitative findings were used to explain the factors underlying the quantitative scores, including barriers, challenges, and supporting factors for digital transformation. Furthermore, both results were integrated through triangulation to obtain comprehensive conclusions and form the basis for developing strategic recommendations.

The research procedure included seven stages: preparation and preliminary study, instrument development, quantitative data collection, IKD score analysis, qualitative data collection through interviews and observations, thematic analysis and data integration through triangulation, and report preparation and strategic recommendations. The analysis results were used to explain the digital maturity level of St. Carolus Summarecon Hospital and to formulate input for improving IKD scores in the following period.

RESULTS AND DISCUSSION

Table 1. Interpretation of Maturity Assessment Results

Level	Explanation
1	Early/Ad Hoc: The digitalization process is manual and unstructured. There is no standard system that is applied uniformly across all units.
2	Repetitive/Managed: The system has begun to be implemented in several units, but has not yet been fully integrated. Basic documentation is available, although it is inconsistent.
3	Defined: Systems and infrastructure have been standardized at the organizational level. All units are starting to utilize the same platform, but integration with external parties may still be limited.
4	Measurable/Quantitative: The process has been measured quantitatively, monitored with performance indicators, and managed well using data.
5	Optimization: Processes are continuously improved through innovation, optimization, and full utilization of technology.

Table 2. Maturity Level Evaluation Results

Component	Sub-Components	Parameter	Parameter Score	Informant
I. Hospital Information Systems and Infrastructure	A. Front Office	IA1. Basic Information System Architecture	4	Outpatient and Inpatient Administration
	B. Back Office	IB1. Back Office	5	Outpatient and Inpatient Administration
	C. Quality of Information and Communication Technology	IC1. Internet Network	4	Outpatient and Inpatient Administration
		IC2. Electronic data communications infrastructure	5	Outpatient and Inpatient Administration
		IC3. Information Systems Innovation	3	Outpatient and Inpatient Administration
	D. Quality of ICT Services	ID1. Information and communication technology services	5	IT (Information Technology) Officer
		ID2. Information System Technical Support	3	IT (Information Technology) Officer
		ID3. Information System Maintenance	5	IT (Information Technology) Officer
	E. Interoperability Services and Routine Reporting	IE1. Information system integration and interoperability services	4	IT (Information Technology) Officer
		IE2. Bridging SIMRS	3	IT (Information Technology) Officer
		IE3. Bridging IS Patient Service Management	4	IT (Information Technology) Officer
	F. Health Information Management System Infrastructure Resource Planning	IF1. Planning and Procurement of Information System Infrastructure	5	Head of Service Division
II. Standards and Interoperability	A. Internal interoperability	II.A.1. Internal Hospital Data Exchange	4	IT (Information Technology) Officer
	B. External interoperability	II.B.1. External Data Exchange Standard	5	IT (Information Technology) Officer
		II.B.2. Exchange of Individual Data	5	IT (Information Technology) Officer
III. Management and Governance of Hospital Information Systems	A. SIMRS/RME Strategic Plan	III.A.1. Hospital Information System Strategic Plan	5	Head of Service Division
		III.A.3. Monitoring and Evaluation of IT Strategic Plans	4	Head of Service Division

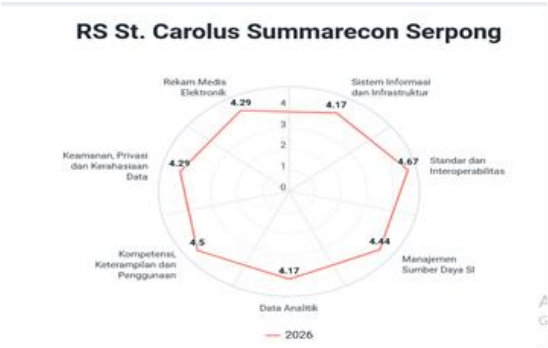
	B. SIMRS / RME Management	III.B.1. Formulating IT Governance	4	IT (Information Technology) Officer
		III.B.3. Monitoring and Evaluation of IT Unit Governance	5	IT (Information Technology) Officer
		III.B.4. Guidelines and Implementation of SIMRS/RKE	4	IT (Information Technology) Officer
	C. Human resources of the SIMRS management unit	III.C.1. Recruitment of IT Unit HR	5	Head of Service Division
		III.C.3. SIMRS Unit and Number of SIMRS Unit Human Resources	4	Head of Service Division
		III.C.4. Development of SIMRS HR capacity	4	Head of Service Division
	D. Information System Investment	III.D.1. Information Systems Investment	5	Head of Service Division
IV. Data Analytics	A. Data Use and Quality	IV.A.1. Data collection system in hospitals	4	IT (Information Technology) Officer
		IV.A.2. Technical approaches to generating information	3	IT (Information Technology) Officer
		IV.A.3. Use of data in hospitals	4	IT (Information Technology) Officer
		IV.A.4. Data quality in hospitals	4	IT (Information Technology) Officer
	B. Big Data Analysis	IV.B.1. Big data approach in hospitals	5	Head of Service Division
		IV.B.2. Resources for managing big data in hospitals	5	Head of Service Division
V. Competence, Skills and Use	A. Digital Literacy	VA1. Use of digital technology	4	Outpatient and Inpatient Healthcare Workers
		VA2. Hospital staff using the Hospital Information System	5	Outpatient and Inpatient Healthcare Workers
		VA3. Use of hospital information systems	5	Outpatient and Inpatient Healthcare Workers
		VA4. User engagement	4	Outpatient and Inpatient Healthcare Workers
	B. Perception of Ease and Usefulness	VB1. Ease	5	Outpatient and Inpatient Healthcare Workers
		VB2. User experience	5	Outpatient and Inpatient Healthcare Workers
		VB3. Usefulness	5	Outpatient and Inpatient Healthcare Workers
	C. Encouragement of SIMRS Use	VC1 IT Champion	5	Outpatient and Inpatient Healthcare Workers
		VC2. System usage incentives	4	Outpatient and Inpatient Healthcare Workers
		VC3. Usage Monitoring	4	Outpatient and Inpatient Healthcare Workers
	D. Knowledge Management	VD1. Knowledge Management	4	Outpatient and Inpatient Healthcare Workers
		VD2. Service unit involvement	4	Outpatient and Inpatient Healthcare Workers
VI. Security, Privacy and Data Confidentiality	A. Information System Security	VI.A.1. Information system security policy	5	IT (Information Technology) Officer

		VI.A.2. Investment in SIMRS security	4	IT (Information Technology) Officer
		VI.A.3. Information system security testing	4	IT (Information Technology) Officer
		VI.A.4. Evaluation of compliance with hospital IS security policies	5	IT (Information Technology) Officer
	B. Implementation of information system security procedures	VI.B.1 Implementation of information system security procedures	4	IT (Information Technology) Officer
		VI.B.2. Personal Data Protection	4	IT (Information Technology) Officer
		VI.B.3. Anticipating information system security breaches	4	IT (Information Technology) Officer
VII. Electronic Medical Records	A. RME Function	VII.A.1. Electronic medical record design	5	Medical Records Officer
		VII.A.2. Data in electronic medical records	4	Medical Records Officer
		VII.A.3. Impact of RME on patient care	4	Medical Records Officer
		VII.A.4. Access to electronic medical records	4	Medical Records Officer
		VII.A.5. Digital image data	4	Medical Records Officer
		VII.A.6. Integration of Clinical Service Flow	4	Medical Records Officer
		VII.A.7. Medical records interoperability	4	Medical Records Officer
	B. Patient-Centered Care	VII.B.1. Patient Satisfaction	4	Head of Service Division
	C. RME Depth	VII.C.1. Administrative	3	Medical Records Officer
		VII.C.2. Clinical documentation	5	Medical Records Officer
		VII.C.3. Pharmacy and Drug Use	4	Medical Records Officer
		VII.C.4. Medical Support Services	5	Medical Records Officer
		VII.C.5. Interoperability Standards	5	Medical Records Officer
	D. Patient Personalization Services	VII.D.1. Personalized Patient Services	5	Medical Records Officer

Based on this configuration, a Random Forest was built with 500 decision trees, max_

Table 1 Maturity Level Component Assessment

Level	Component	Total Rating
I	Hospital Information System and Infrastructure	4.17
II	Standards and Interoperability	4.67
III	Management and Governance of Hospital Information Systems	4.44
IV	Analytical data	4.17
V	Competence, Skills and Use	4.5
VI	Security, privacy and data confidentiality	4.29
VII	Electronic Medical Records	4.29



In-depth interviews and FGDs were conducted to explore the condition of the 7 components of the Ministry of Health's Digital Maturity Index (DMI) by involving internal hospital informants, namely the Head of the Service Division, Head of SIMRS/IT, Head of Medical Records, Medical Records staff, administrative officers, as well as outpatient and inpatient health workers.

Focus Group Discussion (FGD) was conducted on March 23, 2026 at 14.00 in the meeting room of St. Carolus Hospital, Summarecon Serpong.

Components: Hospital Information System and IS Infrastructure

Score: 4.17 Level: The information system and infrastructure are running well, stable, and integrated between units, but optimization of utilization still needs to be improved.

Recommendation: Increase server, network, and hardware capacity to reduce system disruptions/downtime.

Moderator : Come onLet's discuss hospital IS infrastructure. What do you think?

Participant 1 (IT) : “The infrastructure is quite stable. The main server and the network between units like outpatient care, the emergency department, and the pharmacy are well-integrated. Major disruptions are rare."

Participant 2 (Head of Outpatient Services): "Yes, the infrastructure is good, but its utilization is still lacking. Some features are not being fully utilized."

Participant 3 (IT) : "We"We agreed that server and network capacity needs to be increased so that there are no more disruptions during peak hours."

Moderator : Conclusiongroup?

All : “The infrastructure is already running well, but its capacity needs to be increased to reduce network disruptions and optimize utilization.”

Components: Standards and Interoperability

Score: 4.67 Level: Standards and interoperability are excellent, and the system has been widely integrated both internally and externally. Recommendation: Maintain and continue to develop integration with the SATUSEHAT platform.

Moderator :How interoperable is our system with national standards?

Participant 1 (Head of Division) : “It's very good, widely integrated both internally and externally."

Participant 2 (Head of IT) : “The system is already extensively integrated, both internally and externally. Our primary focus now is to maintain this performance and continue developing integration with the SATUSEHAT platform.

The group's conclusion: "The standards and interoperability are already excellent. Please maintain and continue to develop them with SATUSEHAT.".

Components: Management and Governance of Hospital Information Systems

Score: 4.44 Level: Information system governance is structured, documented, and running effectively. Recommendation: Strengthen routine performance monitoring.

Moderator :How is the management and governance of the hospital's IS according to the team?

Participant 1 (IT) : “It is well structured and documented.”

Participant 2 (Admin) : “The process is effective, but performance monitoring still needs to be more routine.”

Participant 3 (Head of Division) : “Agreed, we need to strengthen monitoring so we can detect problems more quickly.”

Conclusion : “Tata"Management is good, increase performance monitoring regularly."

Components: Data Analytics

Score: 4.17 Level: Data processing is underway, but its utilization for decision-making is not yet optimal. Recommendation: Build an analytics dashboard and train the team in predictive analytics.

Moderator : Come onDiscuss analytical data. What are the obstacles?

Participant 1 (RM) : "We"We have enough data, but we need an analytics dashboard so leaders can see trends in real time. We also need training in predictive analytics to make this data more meaningful for the future."

Participant 2 (Health Worker) : “Yes, we need a better dashboard.”

Participant 3 (Head of Division) **:**“And predictive analytics training for the team is also important.”

Conclusiongroup: “Build analytics dashboards and train teams for predictive analytics.”.

Components: Competence, Skills and Use

Score: 4.5 Level: HR already has good competence in using information systems.
Recommendation: Conduct ongoing training for all staff.

Moderator :How are the team's competencies and skills in using IS?

Participant 1 (Nurse) : “It's good enough, we can use the system every day.”

Participant 2 (Doctor) : “But there are new staff who still need guidance.”

Participant 3 (Head of Division) : “Ongoing training is essential for all levels.”

Conclusion :“Competence is good, carry out continuous training for all staff.”

Components: Security, Privacy and Data Confidentiality

Score: 4.29 Level: HR already has good competence in using information systems.
Recommendation: Strengthen security policies and regular audits.
Moderator :How does the team view data security and privacy?
Participant 1 (RM) : “HRalready understand the importance of confidentiality.”
Participant 2 (RM) : “But regular audits and stricter policies are still needed.”
Participant 3 (IT) : “Yes, so that there are no data leaks.”
Conclusion **:**“Strengthen security policies and conduct regular audits.”

Components: Electronic Medical Records

Score: 4.29 Level: RME implementation is running well and is used in services.
Recommendation: Improve RME interoperability with other systems.

Moderator :What was the team's experience with RME? Participant 1 (Doctor) : “It's good and makes service easier." Participant 2 (Nurse) : “But integration with other systems is still possible improved.”

Participant 3 (Head of Division) : “Agreed, RME interoperability should be broader.”

Moderator :To be integrated with one healthy system, what systems still have obstacles?

Participant 4 (IT) :For SATUSEHAT, we've just completed the integration phase of demographic, encounter, and diagnostic (ICD-10) data. Failures often occur when SIMRS/PACS attempts to upload all raw image files to SATUSEHAT. For imaging (radiology data), we're awaiting the readiness of the DICOM gateway from the ministry, but locally, our servers are ready to send metadata and image links if regulations require it.

Participant 3 (Head of Division) : “This means that in terms of infrastructure vision, we are on the right track."

Conclusiongroup: “RME implementation is good, improve interoperability with other systems.”

Discussion

This process requires a careful analysis of the existing system's capabilities and identification of areas that need improvement. Evaluating the digital maturity of a health information system provides a foundation for introspection, addressing deficiencies, and planning for the future. The goal of this process is to build a trustworthy health information system that produces quality data and information, and serves as an indicator of the program's success. The following is a discussion of each component:

Components: Hospital Information System and IS Infrastructure

OnIn 2025, the Hospital Information System and IS Infrastructure Component obtained a score of 3.8, indicating that the hospital's information system and information technology infrastructure have been running quite stably with adequate integration between units, although there is still room for improvement in terms of system capacity and reliability. Entering 2026, there was a significant increase with a score of 4.17. This increase reflects that the hospital's information system and IS infrastructure are running well, stable, and integrated between units more optimally. However, optimization of infrastructure utilization still needs to be improved, especially through increasing server, network, and hardware capacity to reduce downtime and support the growth of workloads and larger data volumes in the future so that system performance is more optimal in the future.

The increase in the Hospital Information System and Infrastructure Component score from 3.8 in 2025 to 4.17 in 2026 indicates a shift from a developing stage to a more mature and integrated stage. This aligns with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia and the HIMSS (EMRAM) model, where at this level the system is generally more stable, integrated across units, but not yet fully optimized in its utilization (HIMSS, 2023). This improvement also reflects readiness to support interoperability through the SATUSEHAT platform as part of the national digital health transformation (Ministry of Health of the Republic of Indonesia, 2022).

Overall, the 2026 results demonstrate that the hospital information systems and IS infrastructure have developed significantly compared to the previous year, marked by increased system stability and integration. However, optimizing utilization and strengthening infrastructure capacity are still needed to achieve a higher and more sustainable level of digital maturity.

Components: Standards and Interoperability

The Standards and Interoperability Component score showed a significant improvement, from 2.67 in 2025 to 4.67 in 2026. In 2025, this reflected limited implementation of standards and system integration, not yet optimally implemented between units and with external systems. However, in 2026, a leap in maturity occurred, indicating that standards had been well implemented and systems were broadly integrated, both internally and externally. This indicates strong readiness to support more effective and sustainable health data exchange, although efforts to maintain and develop integration, including with platforms like SATUSEHAT, still need to be carried out consistently.

The increase in the Standards and Interoperability Component score from 2.67 in 2025 to 4.67 in 2026 indicates a significant transformation from a limited baseline to a widely standardized and integrated system. In 2025, the low score reflected suboptimal implementation of standards and interoperability, while in 2026, it had reached a high level of maturity, aligning with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia, the HIMSS (EMRAM) model, and global recommendations from the World Health Organization, which emphasizes the importance of standards and interoperability in digital health systems (WHO, 2021; HIMSS, 2023).

Overall, these improvements demonstrate significant success in the transition from limited standards implementation and interoperability to excellent and widely integrated. Going

forward, continued efforts are needed to maintain consistent standards implementation, improve the quality of data exchange, and ensure the system remains adaptive to technological policies developments and digital health, aligned with national and international best practices.

Components: Management and Governance of Hospital Information Systems

The Hospital Information System Management and Governance component's score increased from 3.33 in 2025 to 4.44 in 2026, reflecting significant improvements in information system management. In 2025, governance has begun to take shape but is not yet fully structured and optimally documented. Meanwhile, in 2026, governance has developed to become more systematic, well-documented, and effective in supporting hospital information system operations. This indicates strengthening in information system planning, organization, and oversight, although efforts to improve performance monitoring on a regular and continuous basis are still needed to achieve a higher level of maturity.

The increase in the Hospital Information System Management and Governance Component score from 3.33 in 2025 to 4.44 in 2026 indicates a shift from a more mature, structured, and effective governance structure. In 2025, this reflected a lack of fully documented and optimal governance processes, while in 2026, it demonstrated alignment with IT governance best practices. This aligns with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia, as well as IT governance models such as COBIT developed by ISACA, which emphasize the importance of structure, process, and control in information systems management. Furthermore, this improvement is consistent with the HIMSS digital maturity model (EMRAM) and the World Health Organization's recommendations regarding strengthening governance in the digital transformation of healthcare (WHO, 2021; HIMSS, 2023). These practices are also supported by IT service management standards such as ITIL developed by AXELOS, which emphasize the importance of process-based service management and continuous improvement.

Overall, these improvements demonstrate that hospital information system governance has significantly evolved, becoming more structured, documented, and effective in supporting operations. However, strengthening aspects of performance monitoring, ongoing evaluation, and adaptation to technological developments remain necessary for governance to achieve a higher and more sustainable level of maturity in line with national and international best practices.

Components: Data Analytics

The Data Analytics component's performance showed a significant increase, from a score of 2.17 in 2025 to 4.17 in 2026. In 2025, data utilization was still limited to basic data collection and processing, and had not been optimally utilized to support decision-making. However, in 2026, analytical capabilities have developed significantly, marked by more structured data processing and beginning to be utilized in the decision-making process. Nevertheless, further optimization, such as the development of an analytical dashboard and the implementation of predictive analytics, is still needed to increase the strategic value of data in supporting hospital performance and services.

The increase in the Data Analytics Component score from 2.17 in 2025 to 4.17 in 2026 indicates a significant transformation from the early stages of data management to the use of more advanced analytics to support decision-making. In 2025, this reflected data being limited to descriptive functions and not yet being utilized strategically, while in 2026, it had evolved toward more structured analytics and began to support managerial decisions. This is in line with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia and the HIMSS digital maturity model (EMRAM), which emphasizes the importance of using data for clinical decision support (HIMSS, 2023). Furthermore, this improvement aligns with the World Health Organization's recommendations in its Global Strategy on Digital Health, which encourages the use of data for evidence-based decision-making (WHO, 2021). This practice is also supported by the data analytics frameworks of the OECD and the World Bank, which emphasize the importance of transitioning from descriptive analytics to predictive and prescriptive analytics in modern healthcare systems.

Overall, these improvements demonstrate significant progress in data utilization, moving from

basic processing to a more strategic tool for decision-making. While progress has been achieved, further developments, such as the implementation of interactive dashboards, increased human resource capacity, and the application of predictive and prescriptive analytics, are still needed to optimize and sustainably leverage data utilization for improving hospital performance and services.

Components: Competence, Skills and Use

The achievement of the Competence, Skills, and Use Components shows a significant increase from a score of 3.17 in 2025 to 4.5 in 2026. In 2025, HR competency in the use of information systems is quite good, but is not evenly distributed and still requires strengthening in optimal utilization. Meanwhile, in 2026 there was an increase that reflects that HR has better and more consistent capabilities in using information systems to support services and operations. This indicates success in increasing user capacity and adaptation to the system, although ongoing training and strengthening digital literacy are still needed to ensure optimal and sustainable system utilization across all work units. Top of Form

The increase in the Competence, Skills, and Utilization Component score from 3.17 in 2025 to 4.5 in 2026 indicates significant development from relatively good but uneven human resource capability to a higher and consistent level of competency in information system utilization. In 2025, this condition reflects the persistence of skills gaps and suboptimal system utilization, while in 2026 it demonstrates alignment with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia and the HIMSS (EMRAM) model, which emphasizes the importance of user readiness and competency in supporting digital system implementation (HIMSS, 2023). Furthermore, this increase is also in line with the World Health Organization's recommendations on strengthening the capacity of digital health human resources (WHO, 2021), as well as the digital competency development framework of the OECD and the World Bank, which emphasizes the importance of improving digital literacy, continuous training, and effective technology adoption within organizations.

Overall, these improvements demonstrate that human resource competency and skills in information system utilization have significantly improved and become more evenly distributed, enabling them to more optimally support operations and services. However, ongoing training, increased digital literacy, and adaptation to technological developments remain necessary to ensure optimal and sustainable utilization of information systems across all work units.

Components: Security, Privacy and Data Confidentiality

The Security, Privacy, and Data Confidentiality component's performance showed a significant increase, from 2.43 in 2025 to 4.29 in 2026. In 2025, this condition reflected that data security and protection were still suboptimal, both in terms of policy, implementation, and user awareness. However, in 2026, improvements were observed, indicating that the security system, privacy protection, and data confidentiality management were running well and were more structured. This indicates an increase in policy implementation, strengthening of the security system, and human resource awareness of the importance of data protection. Nevertheless, strengthening through regular security audits, policy updates, and capacity building in dealing with cyber risks remains necessary to maintain the sustainability and reliability of the system.

The increase in the Security, Privacy, and Confidentiality Component score from 2.43 in 2025 to 4.29 in 2026 represents significant progress from a weak baseline to a more secure and well-managed system. In 2025, the low score reflected suboptimal implementation of security policies, privacy protection, and data access control, while in 2026, it demonstrated alignment with best practices in information security governance. This aligns with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia and international standards such as ISO 27799 developed by the International Organization for Standardization on health information security. Furthermore, this improvement is consistent with the HIMSS (EMRAM) model, which emphasizes the importance of data security in digital systems, and the World Health Organization's recommendations on data protection in the digital transformation of health (WHO, 2021). These

practices are also supported by the National Institute of Standards and Technology's cybersecurity framework and the OECD's data governance guidelines, which emphasize the importance of risk management, access control, and ongoing security audits.

Overall, these improvements demonstrate that data security, privacy, and confidentiality have significantly improved, becoming more robust, structured, and reliable in protecting health information. However, ongoing efforts, such as regular security audits, policy updates, and capacity building to address cyber threats, are needed to ensure the system remains secure, adaptive, and compliant with national and international standards.

Components: Electronic Medical Records

The Electronic Medical Records component's performance increased from 3.5 in 2025 to 4.29 in 2026, reflecting progress from a relatively well-implemented system to a more mature and integrated system. In 2025, the use of electronic medical records was already being implemented in services, but there were still limitations in integration and optimal utilization. Meanwhile, in 2026, implementation has become more widespread, stable, and consistently used to support healthcare services. This demonstrated improvements in record quality, data accessibility, and service efficiency. However, increased interoperability with other systems and optimized utilization of medical record data are still needed to achieve a higher level of digital maturity.

The increase in the Electronic Medical Record Component score from 3.5 in 2025 to 4.29 in 2026 demonstrates progress from ongoing implementation toward a more mature, integrated, and optimal system to support services. In 2025, the use of EMR was quite good but still limited to basic functions and not yet fully integrated. Meanwhile, in 2026, it demonstrated alignment with the Digital Maturity Index framework of the Ministry of Health of the Republic of Indonesia and the HIMSS (EMRAM) model, which places the integration and utilization of electronic medical records as key indicators of digital maturity (HIMSS, 2023). This improvement is also in line with the World Health Organization's recommendations on digital transformation in health, which emphasize the importance of an integrated and data-driven electronic medical record system (WHO, 2021). Furthermore, this practice is supported by HL7 International interoperability standards and national policies through the SATUSEHAT platform, which encourages integrated cross-facility health data exchange.

Overall, these improvements demonstrate that the implementation of electronic medical records has significantly improved, becoming more stable, integrated, and supporting healthcare services more effectively. However, improved interoperability, optimized data utilization, and advanced feature development are still needed to ensure the electronic medical records system delivers maximum and sustainable benefits in accordance with national and international standards.

CONCLUSION

Based on the research results, the digital maturity level of St. Carolus Hospital Summarecon Serpong in 2026 showed relatively high condition across all seven components of the Ministry of Health's DMI. The component with the highest achievement was Standards and Interoperability with a score of 4.67, followed by Competence, Skills and Use at 4.50, Hospital Information System Management and Governance at 4.44, Security, Privacy and Confidentiality of Data and Electronic Medical Records each at 4.29, while Information Systems and Infrastructure and Data Analytics each achieved 4.17. The results of interviews and FGDs reinforced the quantitative findings that the digital system has been running stably, integrated, and supporting services, but there is still room for improvement, especially in infrastructure capacity, governance monitoring, utilization of analytics for decision-making, ongoing training, security audits, and expanding RME interoperability with external systems and SATUSEHAT. Practically, the research results can serve as a basis for hospital management in setting priorities for technology development, budget allocation, improving HR competency, strengthening information security, and developing a more focused and sustainable digital transformation roadmap.

This study has limitations because the DMI assessment was conducted at a single hospital and used self-assessment data further refined through interviews, focus group discussions (FGDs), and observations. Therefore, the results cannot be generalized to hospitals with different characteristics. Furthermore, the study did not quantitatively measure the impact of digital maturity levels on service performance indicators, operational efficiency, patient satisfaction, or clinical outcomes. Future research is recommended to involve several hospitals with different characteristics and levels of digital readiness to allow for comparison and identification of factors influencing digital maturity. Future research could also combine the DMI with service performance indicators, cost-benefit analysis, and measurement of the effectiveness of SATUSEHAT interoperability. Longitudinal analysis is also needed to evaluate the sustainability of digital maturity improvements and the effectiveness of the established improvement roadmap.

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