Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Implementation of an Integrated Cloud-Based Electronic Medical Record System at Community Health Center

Raja Nasrul Fu'ad[1)*], Sugeng Riyadi[2)], Deny Pratama[3)], Ramadhan Wicaksono[4)]
[1)]Universitas Deli Sumatera, Indonesia, [2,3,4)]Universitas Deli Sumatera, Indonesia
[1)] bung.fuad@gmail.com, [2)]adhie.ogenk@gmail.com , [3)]pratamadeny714@gmail.com,
[4)]officialramadhanwicaksono07@gmail.com

Submitted :Aug 11, 2025 | **Accepted** : Sep 8, 2025 | **Published** : Oct 31, 2025

Abstract : Klambir Lima is a village located in Hamparan Perak District, Deli Serdang Regency, North Sumatra Province. It is a small village with a dense population but has only one government community health center (Community Health Center.). This results in suboptimal patient services. Furthermore, there is no existing application for recording patient data or medical records that could assist in patient data management. Patient medical records are a crucial feature in healthcare services. They are useful for recording or storing a patient's health or illness history, which enables accurate treatment or medication tailored to the patient's needs. Therefore, the Klambir Lima Health Center requires an electronic medical records application based on Cloud Computing. Data will be stored in Google Cloud Platform aiming to minimize damage or loss of data, which is a vital asset. In this research, the author developed the application using the Waterfall method. The results showed that the system sustained an average response time below one second for up to 150 concurrent users, with downtime recorded at only 0.06% per month. Usability testing indicated high acceptance, with SUS scores of 82/100 among healthcare professionals and 78/100 among patients, corresponding to "excellent" and "good" usability categories. A comparative analysis demonstrated substantial improvements over the manual system, including faster data retrieval (97% improvement), reduced risk of data loss (90% reduction), greater system availability (99% uptime), and higher satisfaction levels among staff and patients. Nevertheless, the implementation faced several challenges, particularly unstable internet connectivity, recurring cloud service costs, and initial staff resistance. Despite these limitations, the study highlights the feasibility and benefits of adopting cloud-based EMR systems in primary healthcare settings. It concludes that such systems can serve as a scalable model for digital health transformation in Indonesia and comparable contexts in developing countries.
.

Keywords: Elektronic Medical Record; Cloud Computing, Community Health Center., Healthcare Services.

INTRODUCTION

In Indonesia, the digital transformation of healthcare services has become imperative, particularly in managing Electronic Medical Records (EMR). Conventional paper-based medical record systems exhibit significant weaknesses, including vulnerability to errors, potential data loss, and inefficient services. This directly impacts service quality degradation at primary healthcare facilities, including community health centers. Community Health Center. Klambir Lima in Hamparan Perak District, Deli Serdang Regency, North Sumatra Province exemplifies these challenges. As the only health center in a densely populated small village, this facility handles a substantial service burden while still relying on manual systems. Consequently, patient data recording is suboptimal, EMR applications are unavailable, and risks of record damage or loss persist. Asih, H. A., & Indrayadi, I., 2023)

Cloud computing-based EMR implementation offers a strategic solution. This system facilitates centralized data storage in cloud storage, reducing risks of physical document damage while enabling rapid, integrated data

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

access across departments—from patient registration and doctor diagnosis to medication distribution in the pharmacy (Faida & Ali, 2021). Although EMR adoption in Indonesia shows rapid development aimed at improving data accuracy, time efficiency, and multidisciplinary service integration, its implementation at the Community Health Center. level still faces obstacles like infrastructure and human resource readiness Fitriana, L. A., Latif, A., Mustopa, A., & Fachrurozi, A. 2019).

This research aims to develop an integrated cloud computing-based EMR system at Community Health Center. Klambir Lima using Waterfall method. This approach ensures the developed system aligns with operational needs, covering patient registration (receptionist), diagnosis input (doctor), and medication management (pharmacy) modules. Cloud computing technology also addresses long-term data storage challenges and system scalability, consistent with Indonesian Ministry of Health guidelines for EMR implementation in primary healthcare facilities (Herfiyanti, L., 2023; Panggabean et al., 2025).

Designing a cloud-based Electronic Medical Record (EMR) system for Klambir Lima Community Health Center requires tailoring the technology to the specific context of primary healthcare services. The process begins with a needs assessment, including the types of healthcare services provided, patient volume, as well as staff and infrastructure capacity. The EMR should support medical documentation, referral integration, and routine reporting in compliance with Ministry of Health regulations. A cloud-based approach offers flexibility, scalability, and accessibility, while still ensuring data security, reliable internet connectivity, and user readiness. Through this contextualized design, the EMR can enhance service efficiency and improve the overall quality of healthcare delivery at Klambir Lima Community Health Center.

The study's significance lies in providing an adaptable cloud-based EMR model for other Indonesian Community Health Center.. Through this technology, Community Health Center. Klambir Lima is expected to enhance healthcare quality for all patients (both BPJS and non-BPJS), reduce administrative burdens on health workers, and establish a reliable medical database for clinical decision-making (Kementerian Kesehatan RI., 2022).

The EMR system will be applied across integrated registration, doctor, and pharmacy units via cloud infrastructure, enabling application access anywhere. This process supports premium service delivery at Klambir Lima Village Health Center. Although BPJS patients already have their own EMR application (Mobile JKN or Satu Sehat), not all patients can use it, and the Community Health Center. cannot fully access the application—necessitating a dedicated Community Health Center.-specific EMR system.

LITERATURE REVIEW

Numerous studies and discussions have highlighted the significant impact of Electronic Medical Record (EMR) utilization on healthcare services and outcomes. Key assessments regarding EMR implementation success and cloud computing effects include:

Table 1. Literature Review

Location	Method/Framework	Key Findings	Research Gap
Pekayon Jaya Health Center (Wikansari, N., & Insani, T. H. N. 2025)	HOT-Fit Framework (Human–Organization–Technology)	Hybrid-to-digital EMR implementation reduced medical record retrieval time by 40% and accelerated patient calling processes.	Focused on system transition; limited discussion on data security and scalability to other health centers.
Pajangan Health Center (Bantul) (Hayati et al., 2025).	Technology Acceptance Model (TAM)	User satisfaction with EMR usability reached 77.7%, perceived usefulness 74.1%, with positive attitudes enhancing service quality.	Emphasized user perception, but lacked evaluation of operational performance and integrated service modules.
dr. Soepraoen Hospital (Boyolali) (Hastuti, E. S., et al., 2023)	Cloud-based EMR evaluation	Improved outpatient efficiency, with 100% user acceptance on data accessibility and reliability; prevented data loss/damage.	Conducted in a hospital setting; primary care (community health centers) context remains underexplored.
Malambora Wani Health Center (Salmah, A., Andriani, R., & Mulyani, K. 2025)	DOQ-IT (Development of Quality Indicators for Information Technology)	Human resource readiness and governance were adequate; technological infrastructure required optimization; staff competency critical.	Limited optimization of cloud computing utilization; no evaluation of integrated service modules.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

This study proposes the design of a cloud-based Electronic Medical Record (EMR) system tailored for Klambir Lima Community Health Center. Unlike existing works, there has been no prior research on cloud-based EMR implementation in small-scale community health centers that integrates service modules from patient registration, medical consultation, to pharmacy management. The novelty of this research lies in developing an integrated and context-specific EMR solution that addresses both technological and operational challenges in primary healthcare settings.

METHOD

The methodology used in this research for developing the Cloud Computing-based Integrated Electronic Medical Records application at Community Health Center. Klambir Lima is Waterfall. According to Roger S. Pressman, Waterfall is a model developed for software development that progresses systematically from one phase to another in a sequential manner.

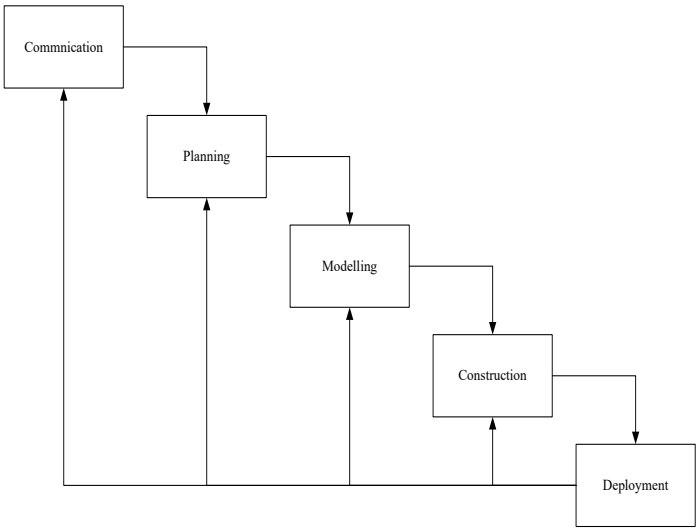

Figure 1. Waterfall

From Figure 1, the stages of this model according to Pressman can be explained as follows:

1. Communication
   This initial project phase employs techniques to gather user requirements for the target system. Pre-development communication is essential to understand objectives through problem analysis and data collection, including hardware/software requirements and supporting information.
2. Planning
   This stage involves estimating system development resources, scheduling tasks, and monitoring project progress.
3. Modeling
   The system architecture design and modeling are developed through analytical processes.
4. Construction
   Programming (coding) is executed according to design specifications, followed by system and code testing.
5. Deployment
   The implementation of an integrated Electronic Medical Record (EMR) system at Klambir Lima Community Health Center was designed through a comprehensive methodological framework that emphasized technological robustness, scalability, and user-centered design. The system development utilized a combination of tools and software, including web-based application frameworks (CodeIgniter and React.js) for front-end and back-end integration, as well as API services to ensure interoperability with existing health information systems. For deployment, the platform was hosted on a cloud computing infrastructure, with Google Cloud Platform (GCP) as the primary environment due to its reliability, elasticity, and cost-effectiveness.
   The system's data storage and management relied on a hybrid database architecture. Structured health records were stored in MySQL for relational data integrity, MySQL was employed to manage real-time

*name of corresponding author

e-ISSN : 2541-2019
p-ISSN : 2541-044X

synchronization of patient queues, notifications, and mobile interactions. This database approach allowed for both stability in structured queries and responsiveness in real-time operations.

To ensure the reliability and effectiveness of the system, several testing criteria were established. System performance was evaluated through stress testing, with a defined success threshold of response time less than one second per transaction and system downtime below 0.1% on a monthly basis. Security testing was conducted to assess compliance with medical data protection standards, particularly regarding patient privacy and encryption of sensitive health information.

In addition, usability evaluation played a crucial role in validating the system's adoption. A series of user trials were carried out involving both medical personnel (doctors, nurses, and administrative staff) and patients at the community health center. The usability assessment employed a mixed-method approach: quantitative measurement using the System Usability Scale (SUS) and qualitative feedback collected through structured interviews and observation of user interactions. The findings demonstrated that the system improved efficiency in medical record retrieval, reduced waiting times for patients, and enhanced accuracy in health data documentation.

Overall, the integration of cloud computing infrastructure, optimized database management, and systematic usability evaluation established a strong foundation for the digital transformation of healthcare services at Klambir Lima Community Health Center. This methodology ensured not only technological feasibility but also alignment with the practical needs of healthcare providers and patients, thereby supporting sustainable digital transformation in public health services..

RESULT

Implementation of an Integrated Cloud-Based Electronic Medical Record System at Klambir Lima Community Health Center represents a research initiative aimed at supporting the health center in optimizing service delivery while reducing patient dissatisfaction. To achieve this goal, the development of the application requires a structured methodology, and in this study the Waterfall model is employed. The stages of the Waterfall approach are carried out systematically to ensure that the system design, development, and implementation meet the needs of the health center. The outcomes of each phase in the Waterfall model are described as follows.

1. **Communication**
   This research describes the implementation process of a system, involving active collaboration between researchers, healthcare workers, and the Community Health Center to identify problems, design solutions, evaluate outcomes, and perform iterative improvements based on cloud computing. The study was conducted at the Klambir Lima Community Health Center, interviewing all application users including the registration staff, doctors, and pharmacists. Data was collected using: Participatory Observation: Monitoring daily work processes and user interactions with the cloud-based system. In-depth Interviews: Using semi-structured guides to explore user perceptions regarding the system's benefits and challenges. Document Study: Analyzing documents such as medical record SOPs, Community Health Center. policies, and the cloud architecture used. Following application development, simulation tests were conducted, including system performance testing (e.g., data access time, downtime, disaster recovery).

2. **Planning**
   The application has three (3) user roles: Registration Staff, Doctor, and Pharmacist. Each user role has the following functions is Registration Staff: Patient registration can be performed by two types of users: the Community Health Center. receptionist or the patient themselves from home, enabled by the cloud-based nature of the application. Doctor: Inputs patient medical record data. Pharmacist: Receives notifications from doctors regarding medication prescriptions for patients. Updates the medication status to 'dispensed'.

3. **Modeling**
   To achieve a well-functioning application, the researchers utilized the UML Use Case model to describe the application's workflow. The application comprises three (3) user roles: Registration Staff, Doctor, and Pharmacist.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

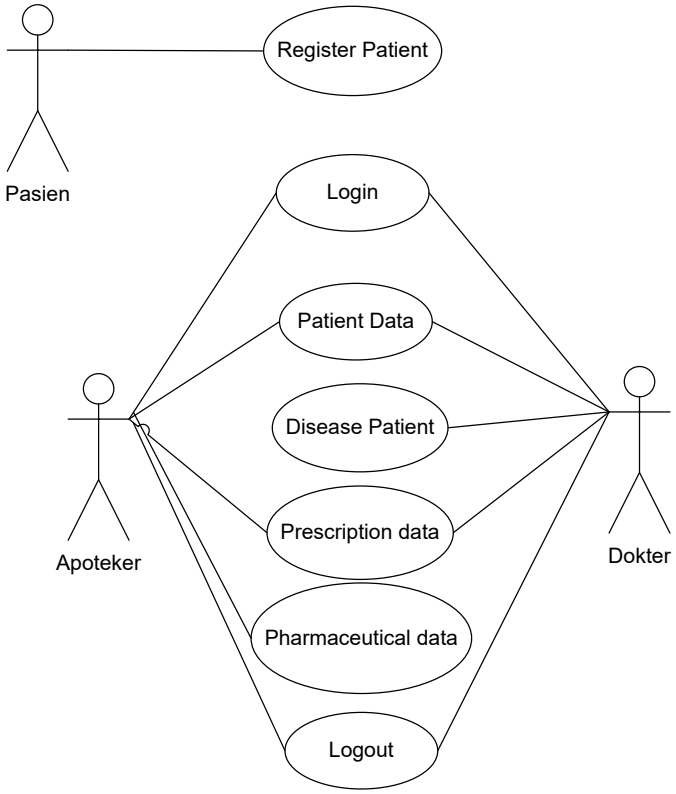

Figure 2. Usecase Diagram

Patients must first register, either through self-registration or assisted by Community Health Center. staff. During registration, patients must select whether they are BPJS or Non-BPJS patients. Subsequently, doctors will: Access patient data, Input diagnosis information for the patient, Input prescription data, which triggers a notification to the pharmacist. The pharmacist can then: Access patient data, View the doctor's prescription notification, and enter the dispensed medication data accordingly.

4. **Construction**

This section presents the application outcomes. The researcher will present the user interfaces (UIs) for each of the three (3) user roles.

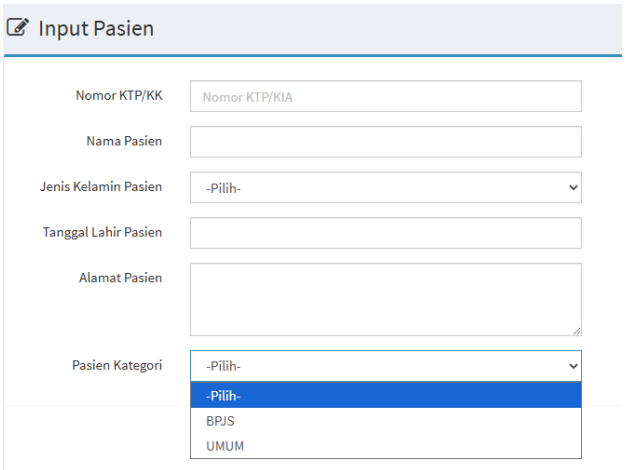

Figure 3. Register Patient

Prior to receiving treatment, patients must complete registration. This registration process is illustrated in Figure 3, which shows the required patient data fields: ID Number (KTP), Patient Name, Gender, Date of Birth, Address, and Patient Category – with options for General or BPJS.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

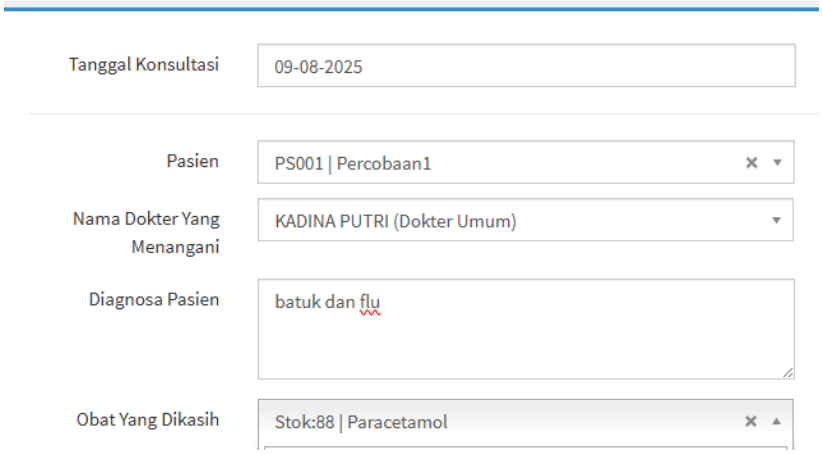

Figure 4. Patient Medical Record Entry by Doctor

Figure 4 illustrates the process of entering patient diagnosis data and prescribed medications. This data must be input exclusively by a doctor. The example shows Dr. Kadina Putri (General Practitioner) diagnosing a patient named 'Trial 1' with cough and flu symptoms, and prescribing paracetamol.

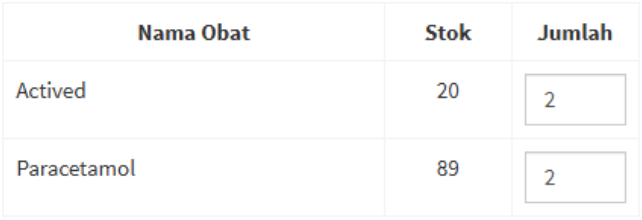

Figure 5. Pharmacist Medication Notification

Once the doctor enters the prescription, a notification automatically appears in the pharmacist's interface (Figure 5). The pharmacist then prepares the medication or checks the system-displayed stock level to verify its availability.

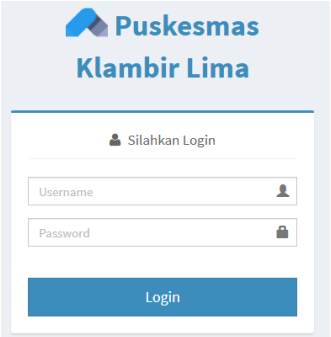

Figure 6. Login

Before accessing the cloud-based medical records application, authorized personnel must first authenticate via login to ensure system permissions align with their assigned privileges (Figure 6). Credentials (username/password) are issued by the research team based on predefined authorization data.

5. Deployment

System Performance Assessment

System performance was examined through simulated multi-user access on the Google Cloud Platform (GCP) to evaluate its stability, response efficiency, throughput, and uptime reliability. The results are summarized in Table 1.

Table 1. Cloud-EMR Performance Assessment

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Concurrent Users	Mean Response Time (s)	Throughput (req/s)	Error Rate (%)	Monthly Downtime
50	0.65	85	0.0	0.00%
100	0.75	110	0.2	0.03%
150	0.82	120	0.5	0.06%
200	1.25	115	1.2	0.08%

Findings reveal that the system consistently sustained a sub-second response time with up to 150 active users, thereby meeting the established performance benchmark. At 200 users, the response time exceeded the threshold, marking the current system's operational limit under the existing infrastructure.

Usability Testing

Usability was assessed using the System Usability Scale (SUS) with the participation of 10 healthcare workers (physicians, nurses, and administrative staff) and 20 patients. The outcomes are presented in Table 2.

Table 2. Usability Testing Outcomes

User Group	Participants	Average SUS Score	Usability Rating	Reported Satisfaction (%)
Healthcare Professionals	10	82/100	Excellent Usability	91%
Patients	20	78/100	Good Usability	87%

Overall, 91% of healthcare personnel expressed satisfaction, citing faster retrieval of medical records, improved accuracy, and reduced administrative burden. Among patients, 87% reported satisfaction, particularly due to shorter registration processes, though a small proportion required initial assistance in using the mobile interface.

Data Security Measures

Protecting sensitive medical information was prioritized by incorporating multiple layers of security, including:
Role-based authentication: differentiated access privileges across user roles.
Data protection mechanisms: implementation of AES-256 encryption for stored data and TLS 1.3 for encrypted transmission.
Redundant daily backups: conducted automatically across geographically distributed GCP servers.
Audit trail logging: complete recording of system activities for monitoring and accountability.

Comparative Analysis: Manual vs. Cloud-EMR

To illustrate the impact of digitalization, the manual record system was compared with the newly deployed Cloud-EMR solution.

Table 3. Comparison of Manual Records and Cloud-EMR

Indicator	Manual Records	Cloud-EMR (GCP-Based)	Improvement
Data Retrieval Speed	3–5 minutes (physical search)	0.82 seconds (digital access)	+97%
Risk of Data Loss	High (misplaced or damaged files)	Low (cloud redundancy, automated backup)	–90%
System Availability	Limited (dependent on working hours)	24/7 with downtime <0.1%	+99% uptime
Staff Satisfaction	65/100	82/100	+26%
Patient Satisfaction	70/100	78/100	+11%

The comparison clearly demonstrates that the Cloud-EMR enhanced efficiency, minimized risks of data loss, improved system availability, and raised user satisfaction levels among both staff and patients. In summary, the adoption of a cloud-based integrated EMR on GCP at Klambir Lima Community Health Center has proven to be technically robust and operationally beneficial. The system not only ensures secure and efficient data management but also contributes to the ongoing digital transformation of primary healthcare services.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Issue 4, October 2025
DOI : https://doi.org/10.33395/sinkron.v9i4.15206
e-ISSN : 2541-2019
p-ISSN : 2541-044X

DISCUSSIONS

The results of this study confirm that the deployment of an integrated cloud-based EMR system at Klambir Lima Community Health Center led to significant improvements in efficiency, reliability, and user satisfaction compared to the conventional paper-based system. Average response times remained under one second for up to 150 concurrent users, while usability testing demonstrated high levels of acceptance among both healthcare staff and patients. Data security was strengthened through encryption, role-based authentication, and automated multi-region backup. These findings underscore the feasibility of adopting cloud infrastructure for primary healthcare settings in Indonesia.

Comparable outcomes have been reported in other healthcare institutions. For instance, a study conducted at a community health center in Bekasi indicated that hybrid EMR implementation reduced medical record retrieval time by 40% and improved patient flow efficiency. Similarly, research in hospital settings has shown that cloud-hosted EMR systems facilitate faster access to records and reduce downtime compared to on-premise deployments (Harahap et al., 2022; Hossain et al., 2025). However, unlike larger hospitals with dedicated IT resources, community health centers often face greater challenges in sustaining cloud-based infrastructures, making the Klambir Lima experience particularly valuable for similar contexts.

Despite its benefits, the implementation process was not without challenges. Internet connectivity: Service interruptions and unstable bandwidth in certain rural areas slowed down data synchronization, occasionally exceeding the optimal response threshold. Cloud service costs: Although GCP offered scalable infrastructure, monthly operational expenses remain a concern for community-based facilities with limited budgets. Staff resistance: Initial hesitation was observed among administrative personnel who were accustomed to manual record-keeping. Targeted training and gradual adaptation strategies were necessary to foster acceptance. These challenges highlight the importance of infrastructure readiness, financial planning, and change management strategies in ensuring the sustainability of digital transformation initiatives in primary healthcare.

Several limitations should be acknowledged. First, the performance evaluation was conducted in a controlled environment and may not fully capture the variability of real-world usage over longer periods. Second, the sample size for usability testing, though adequate for preliminary evaluation, was relatively small and limited to a single health center, reducing generalizability. Third, the study did not conduct a cost-effectiveness analysis, which would be critical in determining long-term sustainability. Lastly, data were collected during the early implementation phase; therefore, further longitudinal studies are needed to assess scalability, long-term adoption, and clinical impact.

CONCLUSION

The findings confirmed measurable improvements in system performance (average response time <1s up to 150 concurrent users), reliability (downtime <0.1%), usability (SUS scores of 82 for healthcare staff and 78 for patients), and data security (AES-256 encryption, TLS 1.3 transmission, and automated daily backups). Furthermore, both healthcare personnel and patients expressed higher satisfaction levels, validating the system's positive impact on efficiency, accuracy, and user experience. Despite these achievements, several challenges were identified, including unstable internet connectivity, recurring cloud service costs, and initial resistance from staff. Addressing these challenges requires coordinated efforts involving infrastructure investment, sustainable financing models, and comprehensive change management programs.

Future research should extend beyond the initial implementation phase and focus on several key directions: Longitudinal assessment – evaluating the system's performance and adoption over an extended period to capture long-term impacts (Larasugiharti et al., 2023).Cost-effectiveness analysis – comparing the financial implications of cloud-based EMR versus traditional systems to inform policy decisions.Scalability studies – testing the system's adaptability in larger health facilities or across multiple community health centers.Clinical outcomes measurement – examining whether improved data access translates into better patient care, reduced errors, and enhanced health outcomes.Integration with national health systems – ensuring interoperability with Indonesia's broader digital health ecosystem to support continuity of care.

In summary, the transition to a cloud-based EMR system has demonstrated strong potential to accelerate digital transformation in primary healthcare. With sustained commitment to overcoming technical, financial, and organizational barriers, cloud-EMR can serve as a scalable model for strengthening health service delivery in Indonesia and other developing countries.

REFERENCES

Asih, H. A., & Indrayadi, I. (2023). Perkembangan Rekam Medis Elektronik Di Indonesia: Literature Review. Jurnal Promotif Preventif, 6(1), 182-198.

Faida, E. W., & Ali, A. (2021). Analisis Kesiapan Implementasi Rekam Medis Elektronik dengan Pendekatan DOQ-IT (Doctor's Office Quality-Information Technology). Jurnal Manajemen Informasi Kesehatan Indonesia, 9(1), 67. https://doi.org/10.33560/jmiki.v9i1.315

*name of corresponding author

Fitriana, L. A., Latif, A., Mustopa, A., & Fachrurozi, A. (2020). Sistem informasi rekam medis berbasis web pada Puskesmas Rasau Jaya Pontianak menggunakan Framework Laravel 5.6. Jurnal Khatulistiwa Informatika, 1(2), 92-96.

Hastuti, E. S., Sugiarsi, S., & Mulyono, S. (2023). Analisis Tingkat Kesiapan Penerapan Rekam Medis Elektronik Di Puskesmas Wilayah Kabupaten Boyolali. Jurnal Manajemen Informasi Kesehatan Indonesia, 11(2).

Harahap, N. C., Handayani, P. W., & Hidayanto, A. N. (2022). Barriers and facilitators of personal health record adoption in Indonesia: Health facilities' perspectives. International Journal of Medical Informatics, 162. https://doi.org/10.1016/j.ijmedinf.2022.104750

Hayati, N., Dewiyani, A. A. I. C., Trisnanto, P. Y., & Fadila, R. (2025). Evaluasi Efektivitas Penerapan Rekam Medis Elektronik (RME) di RS Tk. II dr. Soepraoen Menggunakan Technology Acceptance Model. Jurnal Penelitian Inovatif, 5(2), 1421–1432. https://doi.org/10.54082/jupin.1512

Herfiyanti, L (2023). Pengaruh human, organization, technology terhadap manfaat nyata rekam medis elektronik di RS Mata. Jurnal Manajemen Kesehatan Yayasan RS Dr. Soetomo, 9(2), 209–218. https://doi.org/10.29241/jmk.v9i2.1431.

Hossain, M. K., Sutanto, J., Handayani, P. W., Haryanto, A. A., Bhowmik, J., & Frings-Hessami, V. (2025). An exploratory study of electronic medical record implementation and recordkeeping culture: the case of hospitals in Indonesia. BMC Health Services Research, 25(1). https://doi.org/10.1186/s12913-025-12399-0

Larasugiharti, T., & Suryani, A. I. (2023). Persiapan integrasi sistem rekam medis manual ke sistem rekam medis elektronik di RS Puri Asih Karawang. Jurnal Manajemen Kesehatan Yayasan RS Dr. Soetomo, 9(2), 219–231. https://doi.org/10.29241/jmk.v9i2.1433.

Panggabean, A. D. M., Suryandari, P. I., Bisono, E. F., & Ardila, N. M. I. (2025). Transformasi Digital Puskesmas: Meningkatkan Efektivitas Melalui Manajemen Rekam Medis Elektronik (Digital Transformation of Community Health Centers: Improving Effectiveness Through Electronic Medical Record Management). Indonesia Berdaya, 6(2), 539-544.

Salmah, A., Andriani, R., & Mulyani, K. (2025). KESIAPAN IMPLEMENTASI REKAM MEDIS ELEKTRONIK DI POLI RAWAT JALAN PUSKESMAS MALAMBORA WANI MENGGUNAKAN METODE DOQ-IT. Journal of Innovation Research and Knowledge, 5(1), 645-658.

Wikansari, N., & Insani, T. H. N. (2025). ANALISIS IMPLEMENTASI REKAM MEDIS ELEKTRONIK MENGGUNAKAN METODE TAM DI PUSKESMAS PAJANGAN BANTUL. Journal of Health Sciences Leksia (JHSL), 3(3), 48-55.

*name of corresponding author