

Design and Development of a Web-Based DMS for Community Health Center Accreditation and Self-Assessment Using Extreme Programming

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Abstract

Accreditation document management is one of the essential components in supporting the accreditation process of Community Health Centers (Puskesmas). However, document management is still commonly performed manually using physical archives and digital files stored across multiple storage media. This condition leads to several issues, including difficulties in document retrieval, data duplication, lack of document version control, and the absence of integration between the self-assessment process and supporting accreditation documents. As a result, monitoring activities and accreditation preparation become less effective. This study aims to design and develop a web-based Document Management System (DMS) that integrates accreditation document management with the self-assessment process in a Community Health Center (Puskesmas). The system was developed using the Extreme Programming (XP) software development methodology, which consists of the planning, design, coding, and testing phases. The application was implemented using the Laravel framework, PHP programming language, and MySQL database. System functionality was evaluated using Black Box Testing to ensure that all features operated according to user requirements. "The results show that the developed system provides integrated features for document management, document version control, self-assessment, and accreditation readiness monitoring." integrates the self-assessment process, and provides effective monitoring of accreditation readiness. Therefore, the proposed system is expected to improve the efficiency of accreditation document management and support the continuous implementation of Community Health Center accreditation.

Keywords

Document Management System, Community Health Center Accreditation, Self-Assessment, Extreme Programming, Information System.



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INTRODUCTION

Digital transformation in the healthcare sector has become an important strategy for improving service quality, organizational management effectiveness, and

information governance. Digital health technologies can strengthen health systems by improving efficiency, sustainability, accessibility, and the quality of healthcare services (World Health Organization [WHO], 2021). The integration of digital technologies into primary healthcare is also increasingly important because information systems can support service monitoring, reporting, and evidence-based decision-making (WHO, 2024). As a primary healthcare facility, Puskesmas is required not only to provide high-quality healthcare services but also to meet governance standards established through the accreditation process. In Indonesia, accreditation is intended to improve and ensure the quality of healthcare services and patient safety while strengthening organizational and service governance at Puskesmas (Ministry of Health of the Republic of Indonesia, 2022). Previous research has also demonstrated that accreditation is closely associated with efforts to improve the quality of services and establish a culture of continuous quality improvement in Puskesmas (Marlina et al., 2020; Wulandari & Darma, 2025).

Accreditation documents at Puskesmas include various types of documents, such as policies, Decrees (Surat Keputusan/SK), Standard Operating Procedures (SOPs), guidelines, forms, activity reports, quality indicators, internal audit results, and evidence of service implementation. These documents have a lifecycle that includes preparation, review, approval, distribution, revision, and archiving. Effective information management requires documents to be properly organized, accessible, traceable, and maintained throughout their lifecycle. In healthcare information systems, traceability is particularly important because information must be managed in a manner that supports data quality, accountability, and security (Ammenwerth et al., 2013). Audit trails, for example, provide mechanisms for recording user activities and improving the traceability of access and changes within health information systems (Nakamura et al., 2015).

Based on preliminary observations at Puskesmas Cengkareng, accreditation documents are still stored across several media, including unit computers, Google Drive, and physical archives. An interview with the Head of the Quality Team indicated that locating specific documents when needed for internal audits or accreditation survey preparation takes approximately 5–15 minutes, particularly when documents have undergone multiple revisions and are stored in different locations. This condition illustrates the challenges associated with fragmented document storage and the absence of centralized information management. Similar challenges have been identified in the utilization of health information systems across Indonesian Puskesmas, where differences in system availability, implementation, and utilization

continue to affect the effectiveness of digital information management (Manikam et al., 2025).

These conditions indicate that the current document management process does not fully support accreditation requirements, which demand the rapid, accurate, and well-documented availability of supporting documents. At the same time, developments in information technology provide various approaches for improving the effectiveness of document management, one of which is the implementation of a web-based Document Management System (DMS). A DMS enables centralized document storage, classification according to categories or accreditation standards, document version control, user access management, change-history recording through an audit trail, and faster document retrieval. The implementation of digital information systems in primary healthcare has demonstrated potential for improving service management and monitoring. For example, a quasi-experimental study of an integrated digital health information system in primary healthcare found improvements in several healthcare service indicators following system implementation (Anjana et al., 2020). Therefore, an integrated DMS can provide an appropriate technological foundation for improving the management of accreditation-related information.

The integration of a self-assessment module into the system also allows assessment results to be directly linked to supporting documents, thereby facilitating the evaluation and monitoring of accreditation readiness. Self-assessment is an important component of quality improvement because it enables organizations to identify strengths, weaknesses, compliance gaps, and areas requiring improvement. Research on self-assessment in health information management has demonstrated that systematic self-assessment can be integrated into an accreditation process to support continuous quality improvement and organizational performance (Spohn, 2015). In the context of Puskesmas accreditation, integrating self-assessment with supporting documents can therefore improve the efficiency and traceability of the evaluation process.

Several previous studies have developed document management systems and information systems for healthcare facilities to improve the efficiency of information storage, retrieval, monitoring, and reporting. Digital health information systems have also been shown to support primary healthcare through integrated data management and real-time monitoring capabilities (Anjana et al., 2020). However, most existing implementations focus primarily on electronic health information, service reporting, or digital repositories rather than integrating accreditation self-assessment, document

version control, audit trails, and monitoring dashboards into a single platform. Audit trail research has emphasized that traceability of user activities is fundamental to information security and can also contribute to the quality and accountability of health information systems (Ammenwerth et al., 2013). Consequently, integrating these functions into a single DMS represents an opportunity to provide a more comprehensive solution for accreditation document management.

In addition, research specifically developing a Document Management System (DMS) to support accreditation document management at Puskesmas remains relatively limited, particularly systems capable of integrating each accreditation assessment element with its corresponding supporting documents. From a software development perspective, many information-system projects use conventional development approaches, which may be less responsive to changing user requirements. Extreme Programming (XP) offers an iterative and adaptive development approach that emphasizes communication, continuous feedback, frequent releases, simplicity, and responsiveness to changing requirements (Beck, 2000). The iterative nature of XP makes it suitable for system development environments in which users need to provide continuous feedback during the design and implementation process.

Therefore, this study develops a web-based Document Management System (DMS) that integrates accreditation document management, self-assessment, document version control, audit trails, and monitoring of accreditation standard compliance within a single platform using the Extreme Programming method. The proposed system is expected to provide a more comprehensive solution for supporting accreditation activities at Puskesmas. The integration of digital technologies with organizational and governance requirements is consistent with the WHO strategy, which emphasizes that digital health should be developed according to country and organizational needs while considering interoperability, data security, privacy, efficiency, and sustainability (WHO, 2021).

Based on these conditions, this study proposes the development of a web-based Document Management System (DMS) that integrates accreditation document management and self-assessment processes within a single system. The system is developed using the Extreme Programming (XP) method because it employs an iterative development cycle, emphasizes intensive communication with users, and accommodates changes in requirements throughout the development process (Beck, 2000). Through this approach, the system is expected to be developed more flexibly in accordance with the needs of users at Puskesmas Cengkareng.

Based on the above background, this study identifies several problems: (1) accreditation document management is still conducted manually and is not yet integrated; (2) document retrieval and updating processes are not yet efficient; (3) there is no adequate mechanism for document version control, change-history tracking, and user access management; (4) the self-assessment process has not yet been integrated with supporting documents; and (5) there is no monitoring platform capable of providing rapid and accurate information regarding accreditation readiness.

The research questions of this study are: (1) how can a web-based Document Management System (DMS) be designed and developed to manage accreditation documents and self-assessment at Puskesmas Cengkareng; (2) how can the Extreme Programming method be applied in the system development process; and (3) how can the developed system improve the effectiveness of document management and support the accreditation process at Puskesmas Cengkareng?

This study aims to design and develop a web-based Document Management System (DMS) that integrates accreditation document management with the self-assessment process, apply the Extreme Programming method in system development, and produce a system capable of improving document management efficiency, accelerating information retrieval, supporting document version control, and facilitating monitoring of accreditation readiness at Puskesmas Cengkareng.

METHODS

The research employed a web-based information system development approach to develop a Document Management System (DMS) for accreditation document management and self-assessment at Puskesmas Cengkareng. Data were collected through observation, semi-structured interviews, and literature review. The existing system was analyzed using the PIECES framework, covering Performance, Information, Economy, Control, Efficiency, and Service, to identify problems and determine system requirements.

The system was developed using the Extreme Programming (XP) method, consisting of Planning, Design, Coding, and Testing. System design used UML, while implementation employed Laravel, PHP, MySQL, HTML, CSS, Bootstrap, and JavaScript. The developed system integrates accreditation document management, version control, audit trails, self-assessment, document search, monitoring dashboards, and reporting. System functionality was evaluated using Black Box Testing to ensure that each feature operated according to the defined requirements.

FINDINGS AND DISCUSSION

Results of Requirements Analysis

The requirements analysis was conducted to identify the user requirements and system functions needed for managing accreditation documents and self-assessment at Puskesmas Cengkareng. The analysis was based on observations of the document management process, interviews with parties involved in the accreditation process, and the results of the PIECES analysis. The results of the analysis were subsequently used as the basis for determining the functional and non-functional requirements of the system to be developed.

Observation Results

Direct observations were conducted on the accreditation document management process at Puskesmas Cengkareng. The observation covered document storage, retrieval, updating, distribution, archiving, and the implementation of self-assessment. The observations revealed that accreditation documents were still managed using a combination of physical archives and digital files stored across several storage media. Digital documents were stored on work-unit computers and cloud-based storage media, while some documents were still maintained in physical form. This condition caused document retrieval to take a relatively long time, particularly when documents were required for internal audits or accreditation survey preparation. Based on observations and information obtained from users, locating specific documents could take approximately 5–15 minutes, particularly when documents had undergone several revisions or were stored in different locations. In addition to retrieval problems, there was no centralized mechanism for determining the most recent version of a document, recording document changes, or establishing relationships between documents and self-assessment elements. The process of checking the completeness of supporting documents still required manual matching. Regarding document storage, documents were stored in physical archives and several digital media, resulting in documents not being centrally organized. Document retrieval was conducted based on storage locations or file names, which required a relatively long time. Document updates could result in revised documents being stored as separate files, creating the potential for duplication and errors in version usage. Centralized version control was not yet available, making it difficult to determine the latest document version. Document changes were not systematically recorded, making it difficult to trace modification activities. Access rights were also not integrated into a single system, resulting in suboptimal document control. In the self-assessment process, assessments and supporting documents were not integrated, requiring manual matching. Furthermore, there was no accreditation-readiness dashboard, making compliance status difficult to monitor quickly, while reporting and recapitulation were still performed manually, requiring additional time and work. Based on these observations, a system was required that could centralize document storage, accelerate document retrieval, control document versions and revision histories, and integrate supporting documents with the self-assessment process.

Interview Results

Semi-structured interviews were conducted with parties involved in accreditation document management. The information obtained included the existing business processes, document management problems, user requirements, and expected system features. The interview results indicated that users required a system that would not only function as a document repository but also support document control and monitoring of compliance with accreditation standards. The identified requirements included centralized document storage; document search facilities based on categories, names, standards, or keywords; the ability to distinguish valid documents from previously revised documents; traceable histories of every document change; role-based access control; the ability to associate documents with self-assessment elements; information regarding the compliance status of each assessment element; a dashboard for management and the quality team to monitor accreditation readiness; and reporting facilities to support evaluation and monitoring. The interview findings were then combined with the observation results and PIECES analysis to determine the system requirements.

Results of PIECES Analysis

The PIECES analysis was used to identify problems in the existing system based on six aspects: Performance, Information, Economy, Control, Efficiency, and Service. The results indicated that the main problems occurred in document retrieval, information management, document control, process efficiency, and information services provided to users.

In terms of Performance, the analysis examined the ability of the existing system to complete document management processes accurately and quickly. Accreditation document management was still conducted using a combination of physical documents and digital files stored in several locations. This condition required staff to manually search for documents in different storage locations when documents were needed for audits, quality evaluations, or accreditation preparation. In addition, the self-assessment process, which used separate media, required staff to manually match assessment elements with supporting documents. The problems identified included non-centralized document retrieval, relatively long retrieval times, manual matching between documents and self-assessment elements, and the inability to monitor document completeness quickly. Therefore, the proposed system needed to provide centralized document storage, document search facilities, and integration between self-assessment elements and supporting documents.

In terms of Information, the analysis focused on the quality, accuracy, completeness, and availability of information generated through the document management process. In the existing system, information concerning accreditation documents was not presented through a single integrated system. The storage of documents across multiple media also created the possibility of having several files with different contents or versions, making it difficult for users to determine which document represented the latest version. Information concerning the

compliance status of self-assessment elements was also not integrated with supporting documents, meaning that the evaluation process still required manual verification. The identified problems included non-centralized document information, difficulty determining the latest document version, the lack of systematic documentation of document changes, the lack of integration between self-assessment status and supporting documents, and the absence of an accreditation-readiness monitoring dashboard. Therefore, the system needed to provide structured document information, document version information, change histories, self-assessment status, and a monitoring dashboard.

In terms of Economy, the analysis examined the costs and resources required for document management. Managing documents through physical archives required paper, ink, storage space, and archive maintenance costs. In addition, non-centralized document storage could result in file duplication and repetitive administrative work. Digitalizing document management through a DMS could reduce dependence on physical documents and minimize repetitive administrative activities. The identified problems included the use of physical documents requiring paper and storage media, the potential for document duplication, the amount of staff working time required for document management and retrieval, and the suboptimal utilization of centralized digital storage. Therefore, the proposed system was expected to reduce the use of physical documents, minimize document duplication, and reduce the time and resources required for document management.

In terms of Control, the analysis examined security, access rights, document control, and the system's ability to record user activities. In the existing system, document management through storage folders and physical archives did not provide a structured access-control mechanism. Furthermore, document changes did not have a version-control and audit-trail mechanism that could allow users to identify who made a change and when the change occurred. The identified problems included non-centralized document access rights, the absence of version control, undocumented document changes, suboptimal control over obsolete documents, and the absence of an audit trail for user activities. Therefore, the proposed system needed to provide user authentication, role-based access control, version control, revision histories, and user activity logging.

In terms of Efficiency, the analysis examined how optimally time, human resources, and other resources were utilized in document management. In the existing system, staff had to perform several repetitive activities, such as searching for documents in multiple locations, checking document versions, matching documents with self-assessment elements, and recapitulating compliance status. These processes resulted in greater time and effort being devoted to administrative activities. The identified problems included manual document retrieval, self-assessment recapitulation using separate media, manual matching of supporting documents with assessment elements, and repetitive work in recapitulating document status. Therefore, the proposed system needed to provide document search, self-assessment integration, supporting-document management, and automated recapitulation and monitoring.

In terms of Service, the analysis examined the system's ability to provide services that were easy, fast, and aligned with user needs. In the existing system, users had to know where documents were stored or request assistance from specific staff members when documents were needed. This condition made access to information dependent on particular individuals. The proposed system was expected to provide easier services through web-based access according to each user's access rights. The identified problems included non-centralized document access, users' dependence on specific staff members to obtain documents, the absence of integrated document search, and the absence of monitoring information accessible according to user permissions. Therefore, the system needed to provide a user-friendly interface, document search capabilities, user-based access, and an information dashboard relevant to the needs of each user.

Based on the PIECES analysis, the main system requirements were not limited to document digitalization but also included document control, self-assessment integration, monitoring, and access security. The PIECES analysis showed that the major problems in the existing accreditation document management system were related to performance, information, control, efficiency, and service, while the economic aspect indicated an opportunity to reduce resource consumption through document digitalization. These findings became the basis for determining the functional and non-functional requirements of the Document Management System (DMS) to be developed.

Results of System Requirements Identification

The results of observations, interviews, and PIECES analysis were subsequently used to identify the system requirements. These requirements were divided into functional and non-functional requirements. Functional requirements refer to the functions or services that must be available in the system to support user activities. Based on the analysis, the proposed system required authentication, user management, document management, version control, audit trails, self-assessment, search, monitoring, and reporting functions. The system needed to provide login and authentication to verify user identities before accessing the system; user management that allowed administrators to add, modify, delete, and manage user data; and access-right management to regulate user permissions according to their roles. The system also needed document-category management so authorized users could manage categories, groups, or classifications of accreditation documents.

The document-management functions included adding, viewing, modifying, and deleting documents according to user permissions, as well as uploading accreditation documents to the system. Authorized users needed to be able to download available documents, while the search function needed to support searches based on keywords, categories, standards, or document attributes. The system also needed to implement version control to store document versions so users could identify and trace document versions. A revision-history function was required to record document changes, including the time and

user responsible for each change. An audit-trail function was also required to record important user activities related to document and system-data management.

The system also needed to provide a self-assessment function for managing assessments of compliance with accreditation-standard elements. Each self-assessment element needed to be associated with relevant supporting documents so that assessment and evidence could be integrated. The accreditation-readiness monitoring function needed to display compliance status based on self-assessment results and supporting documents. In addition, a dashboard was required to present summary information, including the number of documents, compliance status, complete documents, and documents that were not yet available. The system also needed to generate reports related to documents and self-assessment results, manage document status by distinguishing active documents from revised documents, and provide a logout function to terminate the user's session. These functional requirements served as the basis for developing user stories during the Planning stage of the Extreme Programming methodology.

Non-functional requirements concerned system-quality characteristics that were not directly represented as business functions but were necessary to ensure that the system could be used effectively, securely, and sustainably. In terms of usability, the system needed to provide a simple and understandable interface that could be used by users according to their level of authority. Regarding performance, the system needed to respond efficiently to document search, storage, and data-retrieval processes. In terms of security, the system needed to employ user authentication and access restrictions based on user roles. Data integrity required the system to maintain consistency among document data, user data, self-assessment data, and relationships between documents and assessment elements.

In terms of availability, the system needed to be accessible through a network using devices equipped with a browser and a connection to the server. Maintainability required the application to be developed using an organized structure that would facilitate future maintenance and further development. Regarding compatibility, the system needed to operate on modern browsers such as Google Chrome, Mozilla Firefox, and Microsoft Edge. Scalability required the system to support future additions of document categories, users, standards, and system features. Finally, backup mechanisms were required for data and documents to reduce the risk of data loss.

Based on the identified functional and non-functional requirements, the proposed system was designed as a web-based Document Management System that would function not only as a document repository but also as a mechanism for document control and monitoring of accreditation compliance. The integration of centralized document management, version control, audit trails, self-assessment, monitoring, access control, and reporting was intended to address the limitations identified in the existing system and provide a more structured approach to accreditation document management at Puskesmas Cengkareng.

CONCLUSION

Based on the results and discussion concerning the development of a web-based Document Management System (DMS) for accreditation document governance and self-assessment at Puskesmas using the Extreme Programming method, it can be concluded that the web-based DMS was successfully designed and developed to support accreditation document management at Puskesmas Cengkareng through centralized document management, including document classification, uploading and downloading, document searching, version control, and audit-trail recording. The PIECES analysis demonstrated that the existing system presented problems in the aspects of Performance, Information, Economy, Control, Efficiency, and Service, and these findings served as the basis for determining system requirements, particularly centralized document storage, access control, document version management, document retrieval, and accreditation monitoring. The developed system also successfully integrated the self-assessment process with accreditation supporting documents, enabling assessment elements to be linked directly to evidence documents so that evaluation and document tracing could be conducted through a single system. The Extreme Programming (XP) method was applicable because system development was carried out iteratively through the Planning, Design, Coding, and Testing stages, while regular communication and evaluation with users enabled the system requirements to be adjusted to the business processes and operational needs of Puskesmas Cengkareng. Based on the Black Box Testing results, the system was evaluated in terms of functionality and conformity with user requirements, and the actual test results indicated that all tested functions operated according to the defined requirements. Overall, the developed system provides an integrated approach to accreditation document management and self-assessment and can be utilized to support documentation, document traceability, change control, and monitoring of accreditation readiness at Puskesmas Cengkareng. For future development, the system may be enhanced by adding document-expiration notifications, a structured document approval and validation workflow, electronic signatures to support digital document authorization, more comprehensive analytical dashboards and visualizations for self-assessment compliance based on standards, chapters, work units, and assessment periods, integration with health information systems or other internal Puskesmas information systems to minimize data duplication and improve information exchange, and a mobile application or optimized responsive web application to provide greater flexibility for access through mobile devices.

REFERENCES

- Beck, K. (2000). *Extreme Programming Explained: Embrace Change* (2nd ed.). Addison-Wesley Professional.
- Fatikah, A., & Santoso, D. B. (2023). Design and Prototype of SIMAKLIK: Web-based Information System to Support Document Management and Self-Assessment of Primary Care Clinics Accreditation. *International Journal of Advanced Health Science and Technology*, 3(5). <https://doi.org/10.35882/ijahst.v3i5.295>
- Kementerian Kesehatan Republik Indonesia. (2022). Peraturan Menteri Kesehatan Republik Indonesia Nomor 34 Tahun 2022 tentang Akreditasi Pusat Kesehatan Masyarakat, Klinik, Laboratorium Kesehatan, Unit Transfusi Darah, Tempat Praktik Mandiri Dokter, dan Tempat Praktik Mandiri Dokter Gigi. Kementerian Kesehatan Republik Indonesia.
- Kementerian Kesehatan Republik Indonesia. (2024). Peraturan Menteri Kesehatan Republik Indonesia Nomor 19 Tahun 2024 tentang Penyelenggaraan Pusat Kesehatan Masyarakat. Kementerian Kesehatan Republik Indonesia.
- Kusumawardhani, O. B., Damayanti, W., Putri, T. K., Kusumaningtyas, A., & Cahyanti, B. O. F. (2023). Implementation of the Accreditation Document Management System (SISMADAK) in Hospitals: Literature Review. *Media Ilmu Kesehatan*, 12(1). <https://doi.org/10.30989/mik.v12i1.839>
- Lestari, A. P., Devi, Y. N., Arninputranto, W., & Sari, D. P. (2024). Analisis PIECES (Performance, Information, Economy, Control, Efficiency, and Service) pada Perancangan Sistem Informasi Manajemen Inventory. *Seminar MASTER PPNS*, 8(1).
- Ramadhani, S. (2018). PIECES Framework untuk Analisa Tingkat Kepuasan Pengguna dan Kepentingan Sistem Informasi. *Jurnal Teknologi dan Manajemen Informatika*, 4(2). <https://doi.org/10.26905/jtmi.v4i2.2101>
- Shin, H. S., et al. (2013). Development of a Document Management System for the Standardization of Clinical Laboratory Documents. *Annals of Laboratory Medicine*, 33(6), 431–436.
- Dewi, I. K. (2024). *Desain Document Management System (DMS) ECR dengan Metode Extreme Programming*. Purbalingga: Eureka Media Aksara.
- Fatmala, W. O., Amiruddin, A., & Sinta, N. S. (2024). Medical Records Management System. *International Journal of Multidisciplinary Learners*, 1(1), 81–93.
- Haryana Darajatun, R., Nurdin, N., & Kesumah, N. (2023). Pengaruh Status Akreditasi Puskesmas terhadap Indeks Kepuasan Pasien di Puskesmas. *Jurnal Sosial dan Sains*, 3(4), 375–381. <https://doi.org/10.59188/jurnalsosains.v3i4.730>
- Karyono, F. A. (2025). Factors Influencing the Compliance of Person in Charge (PIC)

- in the Accreditation Documentation Management System at Pelita Insani Hospital. *Care: Jurnal Ilmiah Ilmu Kesehatan*.
- Kementerian Kesehatan Republik Indonesia. (2022). Peraturan Menteri Kesehatan Republik Indonesia Nomor 34 Tahun 2022 tentang Akreditasi Pusat Kesehatan Masyarakat, Klinik, Laboratorium Kesehatan, Unit Transfusi Darah, Tempat Praktik Mandiri Dokter, dan Tempat Praktik Mandiri Dokter Gigi. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Kementerian Kesehatan Republik Indonesia. (2023). Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MENKES/165/2023 tentang Standar Akreditasi Pusat Kesehatan Masyarakat. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Koem, A. Z., Tarigan, S. F. N., & Maksum, T. S. (2025). Evaluation of the Health Center Management Information System (SIMPUS) Implementation through PIECES and HOT-Fit Methods at the Puskesmas (Community Health Center) Limboto. *International Journal of Health, Economics, and Social Sciences (IJHESS)*, 7(1).
- Kusumawardhani, O. B., Damayanti, W., Putri, T. K., Kusumaningtyas, A., & Cahyanti, B. O. F. (2023). Implementation of the Accreditation Document Management System (SISMADAK) in Hospitals: Literature Review. *Media Ilmu Kesehatan*, 12(1), 37–45. <https://doi.org/10.30989/mik.v12i1.839>
- Lestari, F. D., Karmanto, B., Mohammad, M. I., & Khasanah, L. (2025). Evaluasi Implementasi E-Puskesmas dengan Menggunakan Metode PIECES di Puskesmas Jagasatru. *Jurnal Kesehatan, Sains, dan Teknologi (JAKASAKTI)*, 4(1). <https://doi.org/10.36002/js.v4i1.3811>
- Prabowo, T. A. (2024). Evaluasi SIMPUS Menggunakan Metode PIECES pada Bagian Pendaftaran di Puskesmas Kecamatan Grogol Petamburan. *Journal of Innovation Research and Knowledge*, 4(7). <https://doi.org/10.53625/jirk.v4i7.10551>
- Rahmi, A., Lastri, S., & Hasnur, H. (2024). PIECES (Performance, Information, Economic, Control, Efficiency, Service) dengan Pemanfaatan Sistem Informasi Manajemen Puskesmas (SIMPUS). *Jambura Journal of Health Sciences and Research*, 6(2).
- Rifdah, G. Z. (2024). Evaluasi Penerapan SIMPUS dengan Metode PIECES di Puskesmas Kedungmundu Semarang. Semarang: DIII Rekam Medis dan Informasi Kesehatan Semarang.
- Setyowati, M., & Prasetya, J. (2022). Penilaian Pencatatan dan Pelaporan Tuberkulosis Berbasis Semar Betul (Semarang Berantas Tuberkulosis) dengan Metode PIECES di Puskesmas Kota Semarang. *Jurnal Kesehatan*.

- Sitepu, L. E., Nababan, D., & Tarigan, F. L. (2023). Analysis of Implementation of Puskesmas Accreditation Policy in Medan City in 2023. *Jurnal Info Sains: Informatika dan Sains*, 13(2), 476–487.
- Sitorus, M. S., Erlindai, E., Hutasoit, T., Christy, J., & Lase, K. (2024). Sosialisasi Kesesuaian Pelayanan Rekam Medis dengan Standar Akreditasi Puskesmas Tahun 2023 di Puskesmas Pasar Merah Medan. *Jurnal Ilmiah Pengabdian Kepada Masyarakat (Ji-SOMBA)*, 3(2). <https://doi.org/10.52943/ji-somba.v3i2.1676>
- Triyanti, E., Hermawan, R., & Ramdani, M. I. (2023). Pendampingan Penyusunan Standar Prosedur Operasional Bagian Pendaftaran di Puskesmas Mangkubumi. *Jurnal Pengabdian Masyarakat (Jupemas)*, 4(1). <https://doi.org/10.36465/jupemas.v4i1.1>
- Zorasofia, Z., Utami, T. N., Nuraini, N., Asriwati, A., & Maryanti, E. (2024). Perbedaan Mutu Pelayanan Kesehatan Masyarakat Berdasarkan Akreditasi Puskesmas di Kota Lhokseumawe Tahun 2023. *Jurnal Kebidanan, Keperawatan dan Kesehatan (BIKES)*, 3(3).