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Design of a Medical Record Retention Information System Using the Waterfall Method at RSIA Mutiara Bunda

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ABSTRACT

This study aims to design a medical record retention information system at RSIA Mutiara Bunda using the Waterfall method. The background of this research is the need for more efficient and accurate medical record management to comply with current regulations and improve the quality of healthcare services. The methodology applied involves stages of requirements analysis, system design, implementation, testing, and maintenance, conducted systematically and sequentially. The research results show that the developed information system can automate the processes of storing, retrieving, and deleting medical records according to applicable retention regulations. Additionally, the system is equipped with reporting and notification features that facilitate staff in monitoring and managing medical records. In conclusion, the implementation of this medical record retention information system successfully enhances the efficiency and accuracy of medical record management at RSIA Mutiara Bunda and provides an implementation model that can be adopted by other hospitals facing similar challenges.

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1. INTRODUCTION

Management of medical records is a crucial aspect of healthcare services, as it serves as a foundation for medical decision-making, patient care planning, and evaluation of healthcare services [1]. Medical records contain highly sensitive information and must be managed appropriately to ensure the security, confidentiality, and availability of accurate and complete information when needed [2].

RSIA Mutiara Bunda currently faces challenges in managing medical records due to a manual and poorly structured system. This condition often leads to errors in archiving, difficulties in document retrieval, and the risk of losing important data [3]. This situation highlights the need for a more efficient and integrated medical record management system.

In this context, the implementation of an information technology-based system is a solution that can improve the efficiency and accuracy of medical record management. A medical record retention information system is an essential component that can help hospitals systematically manage the storage, retrieval, and deletion of medical documents according to applicable retention policies [4].

The Waterfall method is chosen as the approach for developing this system because it provides a structured and systematic framework. This method allows the stages of requirements analysis, system design, implementation, testing, and maintenance to be carried out sequentially and clearly, minimizing the risk of errors and ensuring high system quality [5].

This study aims to design a medical record retention information system at RSIA Mutiara Bunda using the Waterfall method, which is expected to improve the efficiency of medical document management and reduce manual errors in the archiving and retrieval process [6]. With this system, it is hoped that medical information can be accessed more quickly and accurately, ultimately enhancing the quality of healthcare services.

Previous studies have shown that the implementation of information systems in medical record management can provide significant benefits, including increased operational efficiency, reduced document management costs, and improved patient satisfaction [7]. Therefore, this study is expected to make a meaningful contribution to the development of health information systems in Indonesia.

Additionally, this study will also examine the aspects of data security and privacy in the medical record retention information system. Given the importance of patient data protection, the system developed must meet high-security standards to prevent unauthorized access and ensure the confidentiality of patient information is maintained [8].

Thus, this study focuses not only on the technical development of the information system but also on management and regulatory aspects related to medical record management. The results of this research are expected to serve as a reference for other hospitals that wish to implement similar information systems to improve the efficiency and quality of their healthcare services.

2. METHOD

The research methodology used is the information system development method with a Waterfall approach. The Waterfall method is a structured and sequential approach to software development, where each stage must be completed before the next stage begins. This methodology was chosen because it provides a clear and systematic workflow, which is suitable for information system development projects that require comprehensive documentation and clear specifications [9].

The data collection techniques used in this study include interviews, observations, and document studies. Interviews were conducted with hospital management, medical staff, and IT technicians involved in medical record management to obtain information about needs and issues faced. Observations were performed by directly observing the medical record management processes at RSIA Mutiara Bunda. Document studies involved analyzing related documents such as medical record retention policies, standard operating procedures, and management reports to gather comprehensive data about the existing system [10].

The Waterfall method is implemented through several main stages: requirements analysis, system design, implementation, testing, and maintenance. In the requirements analysis stage, system needs are identified and documented based on data collected through interviews, observations, and document studies. This analysis aims to thoroughly understand the needs and expectations of the medical record retention information system to be developed [11]. Figure 1 illustrates the stages of the Waterfall development process.

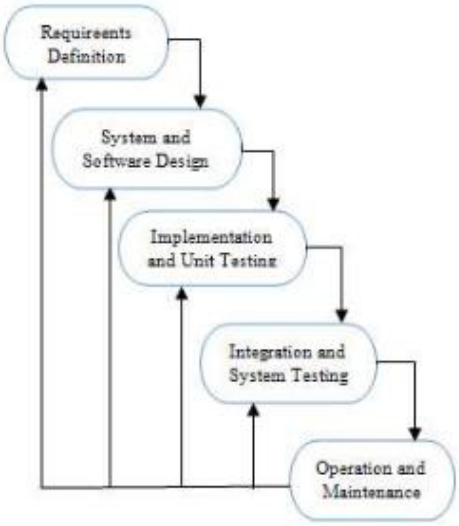

Figure 1. Stages of the Waterfall Development Method

A flowmap diagram is a visual tool used to map the workflow or process of a system, helping to identify steps and data flows between components. In the development of a medical record information system, this diagram facilitates understanding of the overall process flow and communication between development teams.

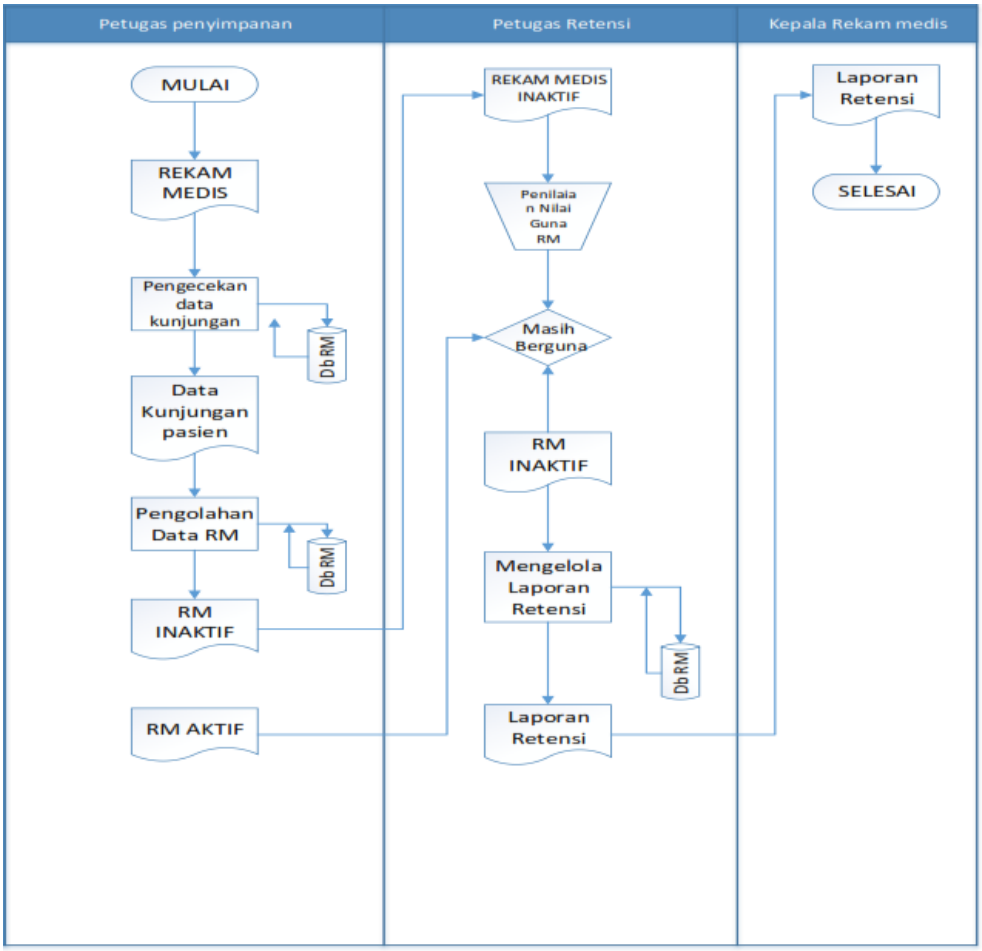

Figure 2. Flowmap to be Developed

2.1 System Design

2.1.1 Context Diagram

A context diagram is a graphic representation of the system that shows the system boundaries, external entities that interact with the system, and the flow of information between external entities and the system. In the context of designing the medical record retention information system at RSIA Mutiara Bunda, the context diagram will illustrate the interactions between the information system and users such as medical staff, hospital management, and external parties involved in medical record management. This diagram provides an overview of the scope and boundaries of the developed system [12].

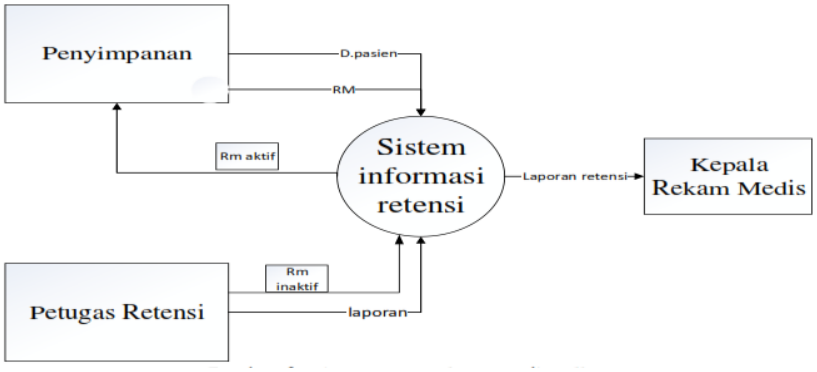

Figure 3. Context Diagram

2.1.2 Data Flow Diagram (DFD)

A Data Flow Diagram (DFD) is a tool used to model the flow of data within a system. DFDs consist of several levels, ranging from DFD Level 0 (context diagram) to more detailed DFD levels. In the medical record retention information system, the DFD will illustrate key processes such as patient registration, medical record documentation, data storage, and user data access. Each process in the DFD shows how data enters the system, how data is processed, and how data exits the system [13].

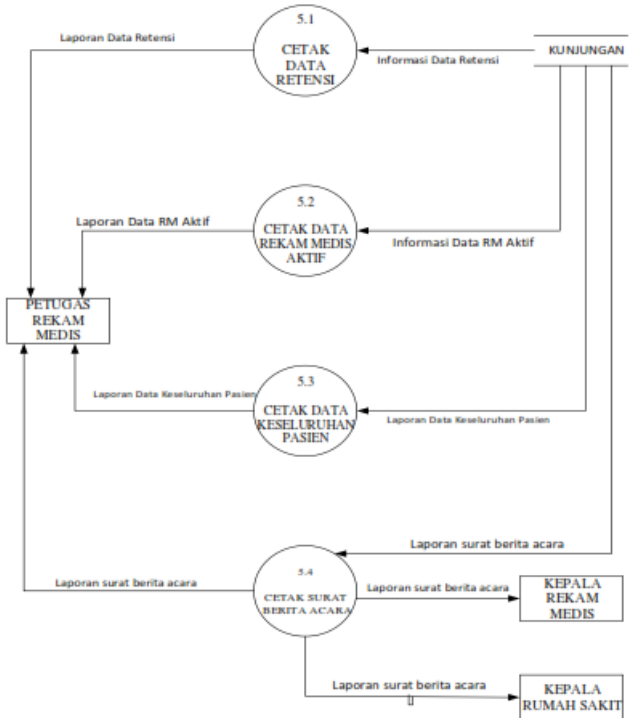

Figure 4. Data Flow Diagram

2.1.3 Entity-Relationship Diagram (ERD)

An Entity-Relationship Diagram (ERD) is a graphical representation of the database structure that shows the relationships between entities in the database. In designing the medical record retention information system, the ERD will depict key entities such as patients, medical records, medical staff, and examination schedules, as well as the relationships between these entities. The ERD helps in designing an efficient database schema and ensures that all data required by the system can be managed effectively [14].

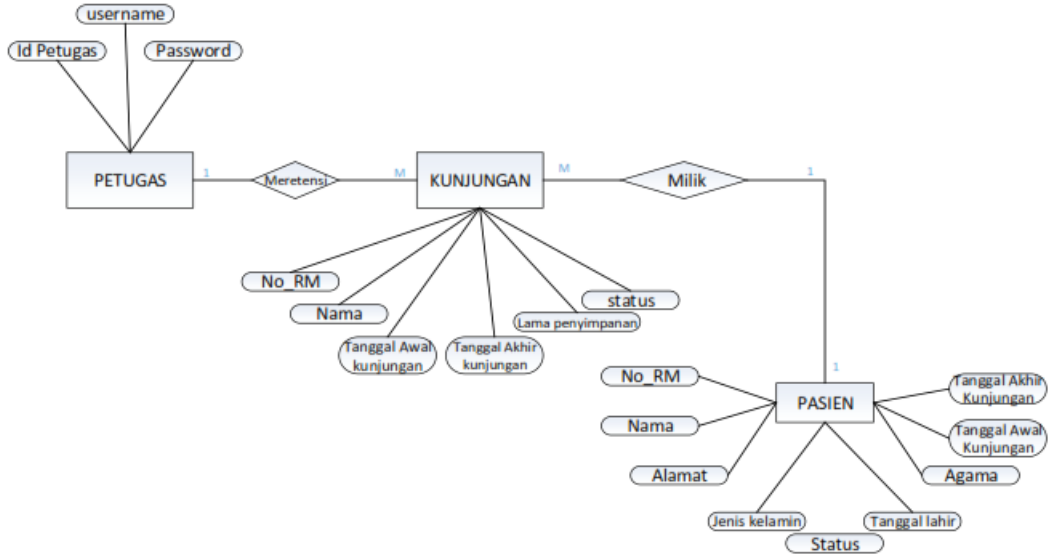

Figure 5. ERD Design

3. RESULTS AND DISCUSSION

The results of the research indicate that the implementation of the Waterfall method in the development of the medical record retention information system at RSIA Mutiara Bunda has successfully improved the efficiency and accuracy of medical record management. During the requirements analysis phase, it was found that the existing system had several weaknesses, such as delays in searching for medical records and difficulties in managing retention data. After designing the system using the Waterfall method, the new system developed addressed these issues more effectively, providing faster search features and a more structured data retention management mechanism.

The implementation of the new medical record retention information system involved several key components, including the creation of context diagrams, DFDs, and ERDs. The context diagram helped in identifying system boundaries and interactions with external entities, while the DFD provided a detailed view of data flow within the system. The ERD was used to design an efficient database and ensure data integrity. The implementation results showed that the new system not only facilitated medical staff in accessing and managing medical records but also improved the speed and accuracy of record documentation and retrieval.

System testing and evaluation were conducted with end-users, including medical staff and management at RSIA Mutiara Bunda. The testing included functional testing, performance testing, and security testing. The test results indicated that the system operated according to the specified requirements and handled large volumes of data with good performance. Additionally, the system is equipped with adequate security features to protect medical record data from unauthorized access. User feedback showed high satisfaction with the new system, particularly regarding ease of use and system reliability.

3.1 System Analysis

The system is designed to make work more effective.

3.1.2 Login Page Display

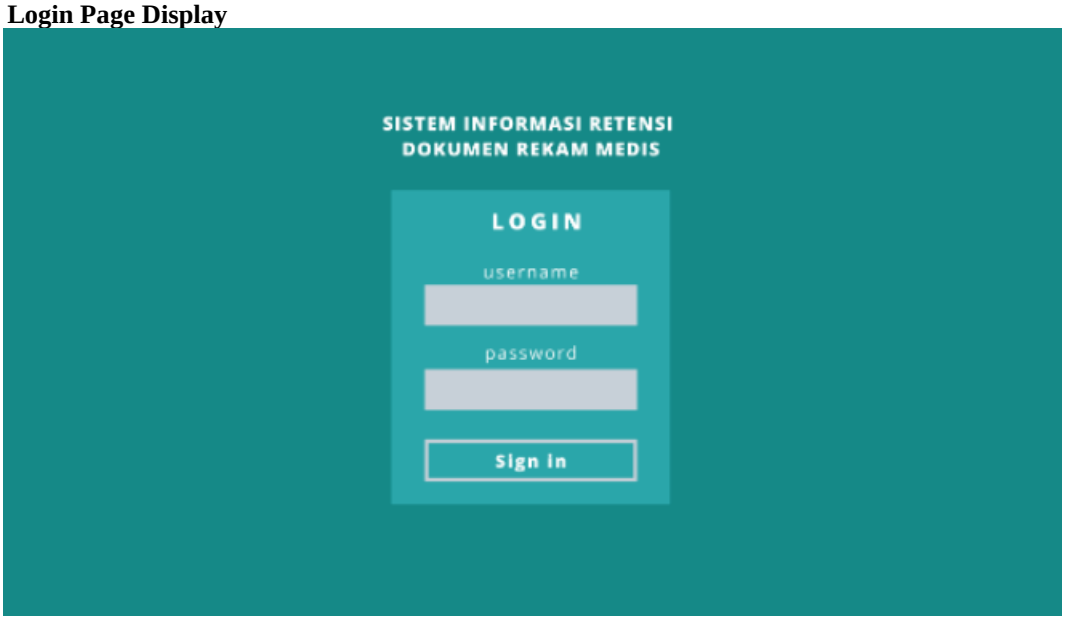

Figure 6. Login Page

3.1.2 Retention Page Display

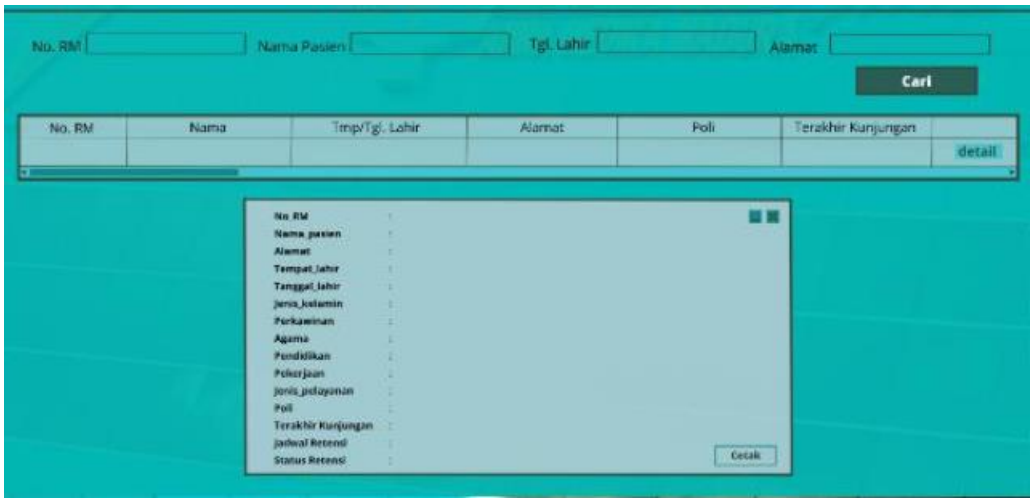

Figure 7. Retention Page

3.1.3 Retention Schedule Page Display

Figure 8. Retention Schedule Page

4. CONCLUSION

This research designs a medical record retention information system at RSIA Mutiara Bunda using the Waterfall method, which enhances the efficiency and accuracy of medical record management. The new system addresses issues found in the previous system by providing fast search features and structured data retention management. Testing results show that the system functions according to specifications and performs well. Additionally, the system has been well-received by end-users, particularly regarding ease of use and reliability.

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