Website-Based UPT Puskesmas Tuntungan Patient Medical Record Information System Using the Design Thinking Method

Reska Handini, Nova Mayasari, Arpan

Abstract

This study aims to design and implement a Website-Based Patient Medical Record Information System at UPT Puskesmas Tuntungan using the Design Thinking method to improve the efficiency, accuracy, and accessibility of medical record management. The research applies five stages of Design Thinking: Empathize, Define, Ideate, Prototype, and Test, involving direct observations and interviews with health workers to ensure that the system meets user needs. The developed system features patient registration, medical record management, medication data, and record reporting, integrated with search, filter, and print functionalities to support administrative processes effectively. Design Thinking can produce a patient medical record information system that aligns with user needs, improves health service quality, and supports integrated and modern medical record management in community health centers.

Keywords: Medical Record Information System, Design Thinking, Website-Based System, Puskesmas, Patient Data Management

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Introduction

Community Health Centers are first-level health care facilities that have an important role in supporting the national health care system, especially in providing primary health services to the community(Dimas et al., 2023)(Sophian, 2023). One important aspect of Puskesmas operations is the effective and efficient management of patient medical records. Medical records are not only medical documentation, but also the basis for clinical decision-making, service evaluation, and health program planning. However, in practice, many Puskesmas, including UPT Puskesmas Tuntungan, still face obstacles in managing medical records that are still manual, prone to errors, and require a long time to search for patient data(Afifah et al., 2022).

The development of information technology today provides a great opportunity to overcome these problems through the implementation of web-based information systems(Muttaqin, 2022)(Septiono & Irawan, 2022). A web-based medical record information system can improve work efficiency, speed up access to information, and reduce the risk of data loss. In addition, this system can also be accessed by various authorized parties, both by medical personnel and administration, in real time and from various locations. Therefore, the development of a web-based medical record information system in the Puskesmas environment is an urgent need to support more modern and integrated health services(Rizal et al., 2022)(Mayasari et al., 2022).

In the development of information systems, the Design Thinking approach is one of the methods widely used to produce solutions centered on user needs(Hardinata et al., 2022)(Permana et al., 2024). This method emphasizes a deep understanding of users, exploration of ideas, and iterative testing of prototypes. By using the Design Thinking approach, the developed system is expected to be able to solve real problems faced by health workers and administrative staff at UPT Puskesmas Tuntungan, and provide a better user experience(Wirda Fitriani et al., 2023).

This research aims to design and build a web-based patient medical record information system using the Design Thinking approach. The results of this research are expected to improve the quality of health services at UPT Puskesmas Tuntungan through more effective and efficient medical data management, and become a model for implementing similar information systems in other Puskesmas.

Literature Review

Advances in information technology have brought significant changes to healthcare systems, particularly in patient data management. Web-based Electronic Medical Record (EMR) systems are an innovative solution to improve the efficiency, accuracy, and accessibility of patient information. According to the Indonesian Ministry of Health (2022), the digitization of medical records in healthcare facilities aims to speed up administrative processes, minimize recording errors, and support data integration between healthcare agencies.

Several previous studies have shown that web-based medical record systems can optimize patient services and improve medical decision-making processes. Putra et al. (2021) developed a web-based medical record information system that makes it easier for health center staff to record and access patient data in real-time, thereby increasing service effectiveness. Meanwhile, Rahmawati and Siregar (2020) stated that website-based systems are more efficient than manual systems because they are able to store data centrally and minimize the risk of data loss.

In the context of system development, the Design Thinking method has become a widely used approach because it is user-centered. Brown (2008) explains that Design Thinking involves five main stages: empathize, define, ideate, prototype, and test, which enable developers to understand user problems in depth before designing the right solution. This approach has proven effective in creating information systems that are not only functional but also easy to use.

Several studies have shown the success of applying Design Thinking in the development of health information systems. Sari et al. (2022) applied this method to design a web-based patient queuing system, which resulted in an 85% increase in user satisfaction. Nasution (2021) found similar results, stating that the application of Design Thinking helped identify the needs of health workers and patients, resulting in a more adaptive and effective system.

Community health centers, as technical implementation units (UPT) of the Health Office, play an important role in providing primary health care services to the community. However, many health centers still face obstacles in managing medical record data, such as manual recording, data redundancy, and difficulty in searching archives. Therefore, the development of a website-based Patient Medical Record Information System at the Tuntungan UPT Health Center using a Design Thinking approach is a strategic step to improve efficiency, data accuracy, and the quality of public health services.

Research Methodology

This research uses the Design Thinking approach as the main method in the process of designing and developing a web-based patient medical record information system at UPT Puskesmas Tuntungan. Design Thinking is a user-centered system development method, with five main stages, namely: Empathize, Define, Ideate, Prototype, and Test(Nur Wulandari et al., 2023)(Fahrudin & Ilyasa, 2021). Each stage is designed to explore user needs in depth, produce creative solutions, and ensure that the system developed really answers problems in the field(Ilham Firman Ashari & Rahmat Rizky Muharram, 2022).

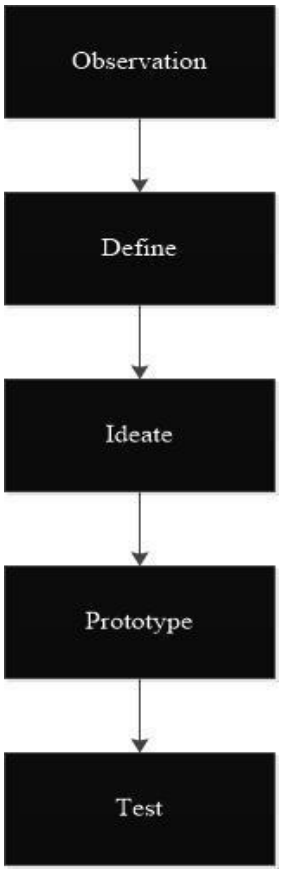


Figure 1. Research Stages

1. Observation

At this stage, researchers conducted direct observations and semi-structured interviews with relevant parties at UPT Puskesmas Tuntungan, including doctors, nurses, registration

officers, and medical records staff. The aim was to understand the existing workflow, the obstacles often faced in managing patient data, as well as the needs and expectations of users for the system to be developed(Widyastuti, 2022).

2. Define

The results of the empathy stage are analyzed to formulate a specific problem statement. This stage resulted in a mapping of key user needs, such as speed of data recording, accessibility of patient data, security of medical information, and ease of use of the system interface. The defined problems become the basis for solution development in the next stage.

3. Ideate

The development team brainstormed various solution ideas based on the defined problem. Several alternative interface designs and system features were proposed and compared. The ideas were then filtered and selected the most suitable ones based on the aspects of functionality, efficiency, and affordability of development.

4. Prototype

Based on the selected ideas, a web-based information system prototype was created with the main features including: patient registration, medical history recording, diagnosis and prescription management, and patient data search. The prototype was developed using the Laravel framework and MySQL as the database, with an HTML, CSS, and JavaScript-based interface design.

5. Test

The prototype was tested by end users, namely medical personnel and administrative staff at the Puskesmas. Testing was conducted to assess the usability, functionality, and effectiveness of the system in supporting the work process. The feedback obtained was used to make iterative improvements to the system(Setiadi et al., 2019).

Results Form Login

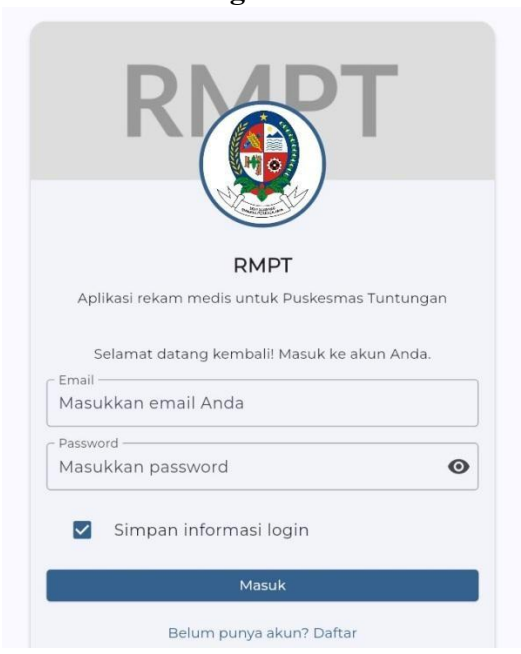


Figure 2. Form Login

Figure 2 shows the login page of the website-based patient medical record information system named RMPT (Medical Record of Tuntungan Health Center), which was designed specifically for UPT Puskesmas Tuntungan. This system is part of the implementation of the

Design Thinking method, which emphasizes understanding user needs and designing solutions that are easy to use and effective.

Form Dashboard

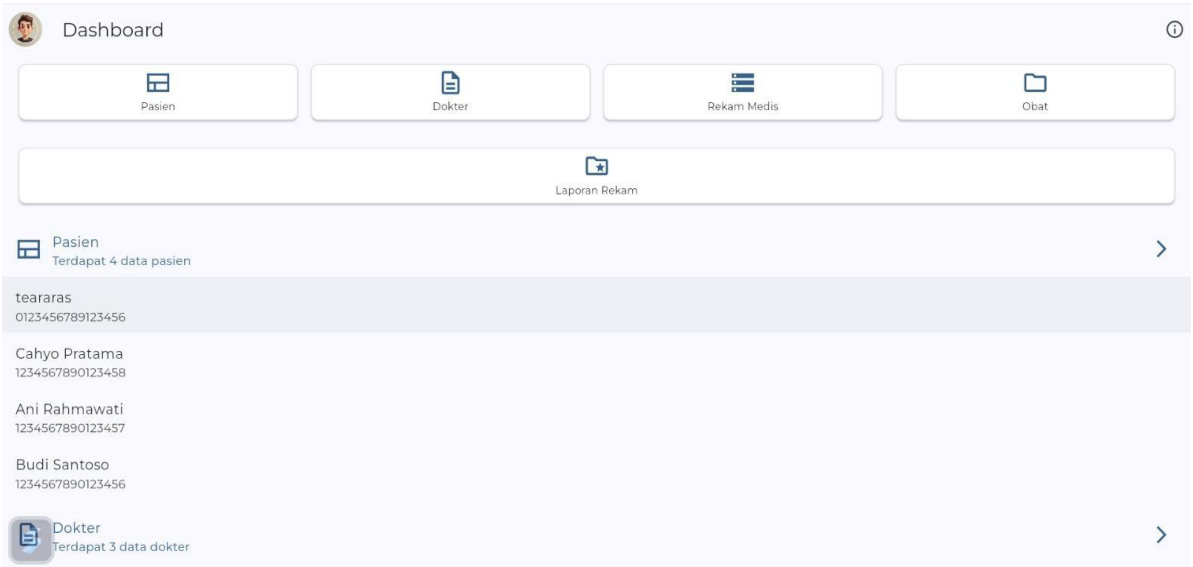


Figure 3. Form Dashboard

Figure 3 shows the dashboard page of the web-based patient medical record information system used at UPT Puskesmas Tuntungan, which was designed using the Design Thinking method to ensure ease and efficiency of use. On this dashboard there are several main menus such as Patients, Doctors, Medical Records, Medication, and Record Reports, which make it easier for users to access data and system features.

Form Pasien

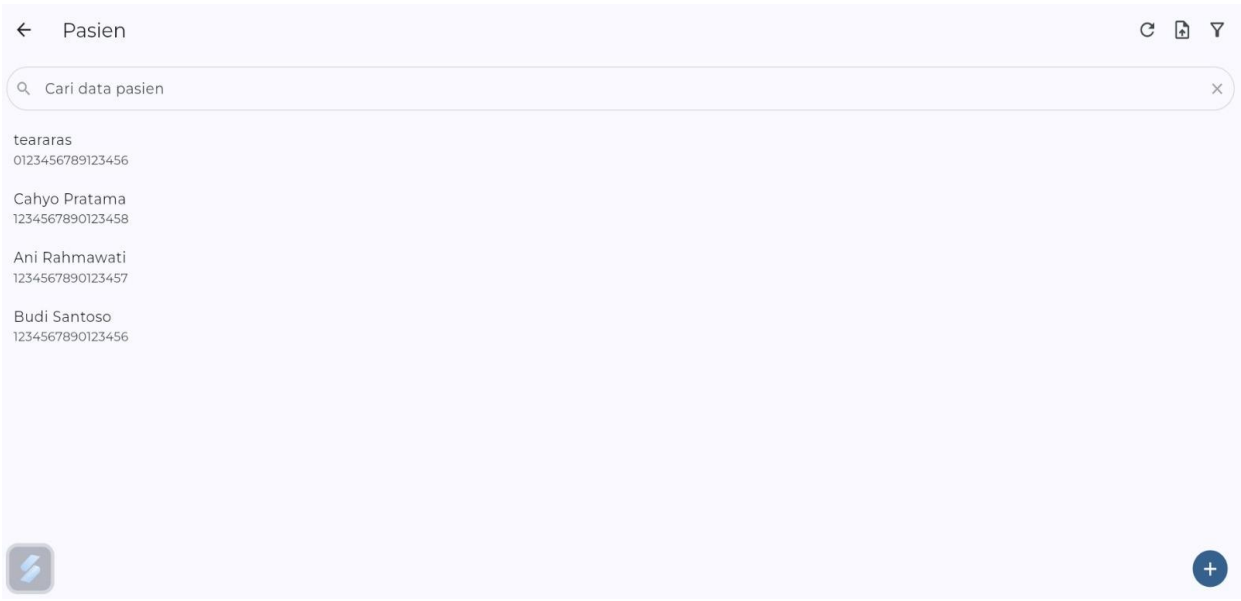


Figure 4. Form Pasien

Figure 4 shows the patient data page of the website-based patient medical record information system implemented at UPT Puskesmas Tuntungan, which was developed with a Design Thinking approach to present a simple, functional, and user-friendly interface. In this display, there is a patient data search feature at the top, followed by a complete list of patients

along with their respective identity numbers, which makes it easier for medical personnel to access and manage patient information quickly and accurately. There is also an add icon (+) to add new patient data, as well as other icons to update or filter data, which supports work efficiency in a healthcare environment. This page shows how the system is designed in a human-centered manner to increase productivity and accuracy in patient medical data management.

Form Dokter

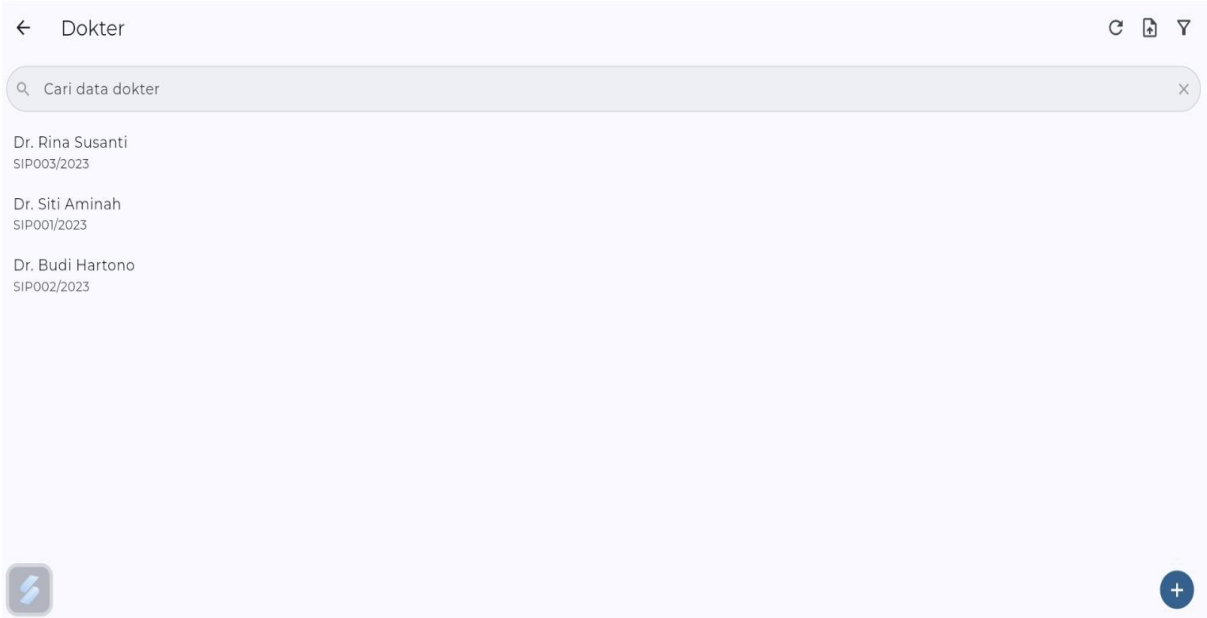


Figure 5. Form Dokter

Figure 5 shows the doctor data page in the website-based patient medical record information system for UPT Puskesmas Tuntungan, which was developed using the Design Thinking method to ensure ease of use and work efficiency. This view presents a list of doctors complete with names and Practice License numbers (SIP), and has a search feature at the top that allows users to find doctor data quickly. There is also an add icon (+) to add new doctor data and other icons to refresh data and filter information. This clean and functional design shows the system's orientation to the real needs of users, namely medical staff and puskesmas administrators, thus supporting the management of health human resources in a more effective and structured manner.

Form Rekam Medis

Figure 6 shows the medical record page of the web-based patient medical record information system used at UPT Puskesmas Tuntungan, the result of development with a Design Thinking approach to produce a system that is responsive to the real needs of users. This page lists the patient's medical history complete with medical record number, patient name, disease diagnosis, and the name of the doctor who performed the diagnosis, such as the example of Cahyo Pratama who was recorded with several diagnoses by different doctors. The search feature at the top allows users to easily find specific medical record data, while the add (+) button at the bottom right corner facilitates quick addition of new data. This clean and organized interface design reflects the system's focus on recording efficiency, information accuracy, and ease of navigation, in accordance with the human-centered design principles of the Design Thinking method, thereby supporting significant improvements in the quality of health services in the Puskesmas environment.

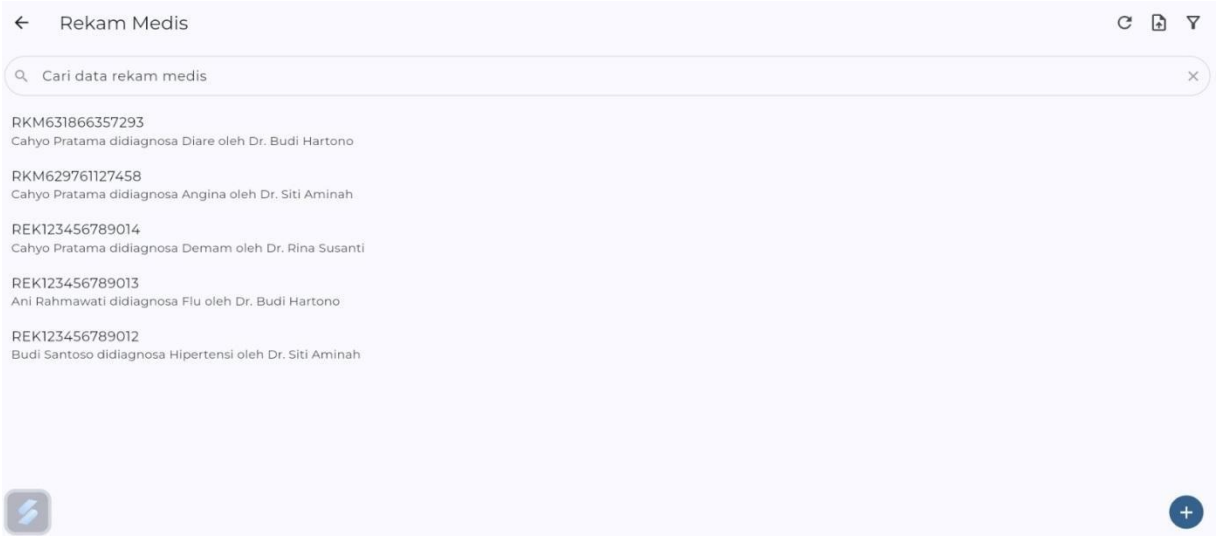


Figure 6. Medical Record Form

Form Obat

Figure 7 shows the interface of the drug data page on the Website-Based Patient Medical Record Information System at UPT Puskesmas Tuntungan using the Design Thinking method, which is designed to facilitate health workers in recording and monitoring the availability and use of patient drugs in a structured and accurate manner. At the top there is a search field "Search drug data" to make it easier for users to find drug data based on the name or drug code quickly. A list of recorded drugs such as Amoxicillin, Amlodipine, and Paracetamol can be seen along with their respective codes (e.g. OBT123456789014) which helps identify and manage drug stocks more efficiently. The clean and minimalist design supports the workflow of puskesmas staff with the use of icons for adding data, filtering, refreshing, and recording, in line with the user-centered approach in the Design Thinking method, so that this system can improve accuracy, service efficiency, and minimize errors in the process of inputting and monitoring drugs in digital patient medical records at Puskesmas Tuntungan.

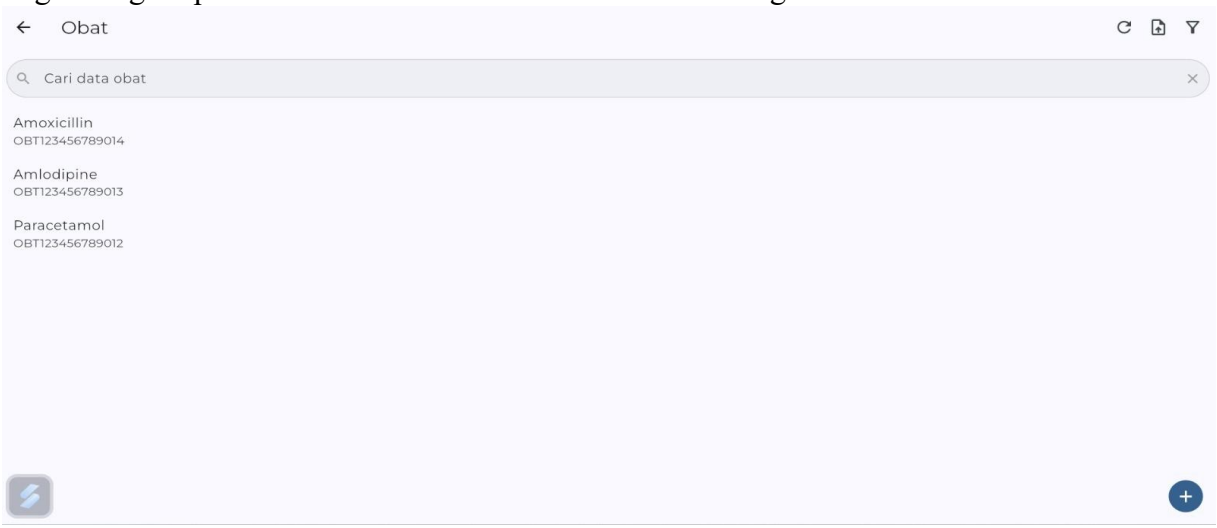


Figure 7. Form Obat

Form Rekam Medis Report

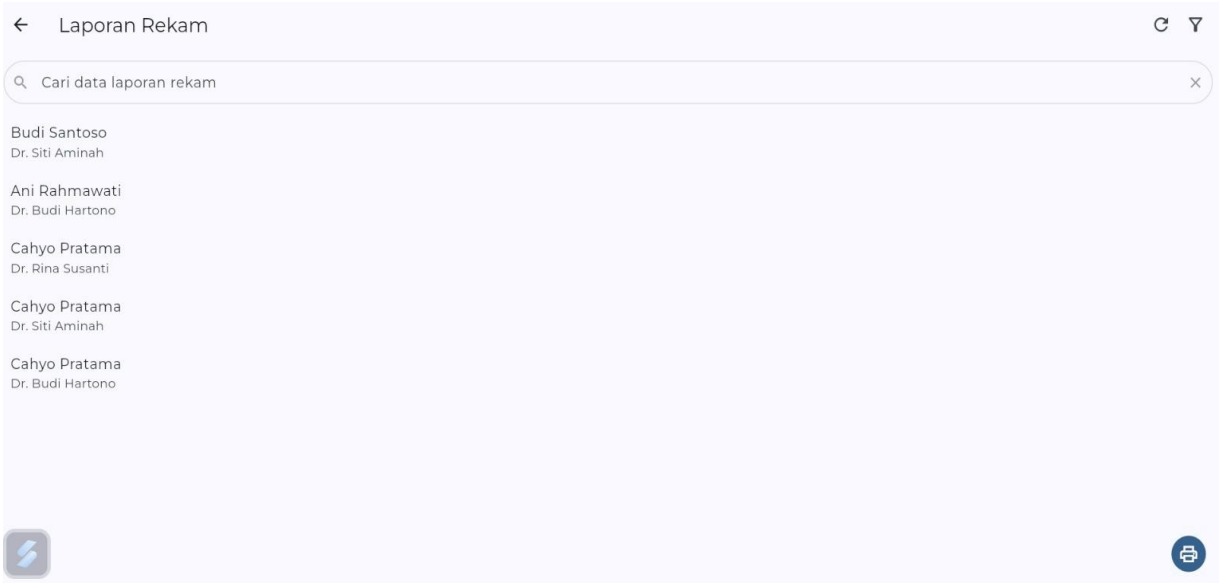


Figure 8. Form Rekam Medis Report

Figure 8 is a view of the Record Report page on the Website-Based Patient Medical Record Information System at UPT Puskesmas Tuntungan using the Design Thinking method, which makes it easier for health workers to monitor and manage patient medical record data neatly, quickly, and accurately. On this page, there is a "Search record report data" column that allows officers to efficiently search for patient names when needed, with a list of patient names such as Budi Santoso, Ani Rahmawati, and Cahyo Pratama displayed along with the names of the doctors in charge such as Dr. Siti Aminah, Dr. Budi Hartono, and Dr. Rina Susanti, making it easier to quickly identify the patient's treatment history. The navigation button feature and print icon on the bottom right support the process of printing medical record reports for administrative needs and digital patient documentation, supporting the efficiency of puskesmas services. This minimalist, clean, and structured interface design is the result of applying the Design Thinking method that focuses on user-centeredness and the workflow of health workers, so that this system is able to assist UPT Puskesmas Tuntungan in providing better, transparent, and systematically documented health services in managing patient medical records.

Conclusion

The implementation of the Website-Based Patient Medical Record Information System at UPT Puskesmas Tuntungan using the Design Thinking method has successfully improved the efficiency and accuracy of patient medical record management. By providing a clean, structured, and user-friendly interface, the system enables healthcare workers to input, search, and monitor patient medical data and medication records quickly and systematically. The integration of search, filtering, and printing features supports daily administrative and service processes, reducing manual errors and saving time in data retrieval and reporting. This system also facilitates transparent and organized medical record management, enhancing the quality of patient services at UPT Puskesmas Tuntungan. Overall, the application of this system has demonstrated that using the Design Thinking method can produce a healthcare information system that is aligned with user needs, improves operational effectiveness, and supports the digitization of patient medical records in community health services.

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