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Development of Dr. Zhulfi Clinic Website-Based Service Management System

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ABSTRACT
Dr. Zhulfi's clinic currently faces various challenges in managing patient services, such as long waiting times, difficulty in accessing medical records, and inefficient appointment arrangements. This study aims to develop a website-based clinic management system that can optimize patient services by increasing the effectiveness and efficiency of clinic operations. The research methodology includes data collection through observation, interviews, and surveys of clinic staff and patients to identify existing needs and problems. Based on the needs analysis results, a prototype system with key features such as online registration, electronic medical record management, appointment setting, and an automatic reminder system was designed. The system was developed using modern web technologies and thoroughly tested to ensure its reliability and ease of use. Initial implementation was conducted in one clinic department, followed by user training and system performance evaluation. The evaluation results showed significant improvements in service efficiency, with shorter patient waiting times and faster and more accurate data access. This study concludes that a web-based clinic management system can provide an effective solution to address operational issues at Dr. Zhulfi's Clinic, as well as improve overall patient satisfaction. Recommendations for further development include integration with the clinic's financial and inventory management systems.

Keywords: *Dr. Zhulfi's clinic, Medical Records, Appointment setting, Patient satisfaction, Automatic reminder system*

INTRODUCTION

Dr. Zhulfi Clinic is one of the health facilities that is committed to providing quality medical services to the community. As a clinic that continues to grow, Dr. Zhulfi Clinic faces various challenges in managing daily operations. As the number of patients and the complexity of the services provided increase, the use of a manual and fragmented management system often causes various problems, such as delays in service, errors in administration, and patient dissatisfaction. According to (Santoso, 2021) The application of information technology in health services can help optimize services through an integrated and efficient system. This is in line with the opinion of (Suwignyo, 2018), which states that a good clinical management system can increase the effectiveness of administrative management and medical services.

Manual patient data management is a major challenge for health services. Storing patient data in physical form is vulnerable to damage or loss, and makes it difficult for officers to access information quickly when needed. In addition, the registration and consultation scheduling process that still uses conventional methods often results in long queues and long waiting times. This condition hurts the quality of services provided by the clinic. In today's digital era, information technology has become an important element in various sectors, including the health sector. The use of information technology in clinic management can be an effective solution to overcome these various problems. One innovation that can be applied is the development of a website-based clinic management system. This system allows the integration of various managerial functions into one platform that is easily accessed and used by all clinic staff (Santoso, 2021; Suwignyo, 2018). According to (Fadhil, 2019), a web-based information system can increase efficiency and speed in data processing and support more appropriate decision making.

A website-based clinic management system can help manage patient data in a more structured and secure manner. With a centralized database, patient information can be accessed quickly by medical personnel, thereby speeding up the diagnosis and treatment process. In addition, this system also allows patients to register and schedule consultations online, which can reduce waiting times and queues at the clinic. This is by the findings (Nugroho, 2021) which shows that the implementation of a website-based system in clinic management can increase service efficiency and provide a better experience for patients.

The development of a website-based clinic management system can also improve communication between patients and medical personnel. Features such as instant messaging, notifications, and consultation schedule reminders can facilitate communication and ensure that patients receive the information they need promptly. In addition, this system allows electronic storage of medical records that can be accessed at any time, making it easier for medical personnel to monitor patient health conditions continuously. The application of digital technology in administrative processes like this has been proven to increase the efficiency and accuracy of services (Syahputra, D., & Handayani, 2023).

METHOD

Dr. Zhulfi Clinic is one of the health facilities that is committed to providing quality medical services to the community. This clinic continues to develop, but still faces various challenges in managing daily operations. Along with the increasing number of patients and the increasing complexity of the services provided, the management system, which is still manual and fragmented, often causes various problems such as delays in service, administrative errors, and patient dissatisfaction. Manual management of patient data is one of the main obstacles. Data stored in physical form is very vulnerable to damage or loss, and is difficult to access quickly by medical staff when needed. In addition, the registration and consultation scheduling process that is still carried out conventionally often causes long queues and long waiting times. This condition certainly harms the quality of service provided by the clinic.

In today's digital era, information technology has become an important part of various sectors, including the health sector. The use of information technology in clinic management can provide effective solutions to existing problems. One innovation that can be applied is the development of a website-based clinic management system. This system allows the integration of various managerial functions into one platform that is easily accessible and used by all clinic staff (Santoso, 2021).

A website-based clinic management system can help manage patient data in a more structured and secure manner. With a centralized database, patient information can be accessed quickly by medical personnel, thereby speeding up the diagnosis and treatment process. In addition, this system also allows patients to register and schedule consultations online, which significantly reduces waiting times and queues at the clinic. This will certainly have a positive impact on patient satisfaction levels and clinic operational efficiency (Nugroho, 2021).

The development of this system also has the potential to improve communication between patients and medical personnel. Features such as instant messaging, notifications, and consultation schedule reminders can facilitate the communication process and ensure that patients receive the information they need promptly. In addition, this system allows for the storage of medical records in digital form that can be accessed whenever needed, making it easier to monitor the patient's health condition continuously (Handayani, 2020).

RESULT AND DISCUSSION

Result

The homepage is the main page that can be accessed without logging in, providing users with an overview of the application and the features it offers. Testing on the homepage includes verifying visual elements such as the header, footer, navigation menu, and main content, to ensure that everything works properly and appears according to the specified design. Testing also includes page performance to ensure fast load times and responsiveness to various devices. The test results show that the homepage functions well, provides smooth navigation, and an appropriate appearance, so that it can be used as an effective and user-friendly entry point for application users. The appearance of the item data page is presented as follows.

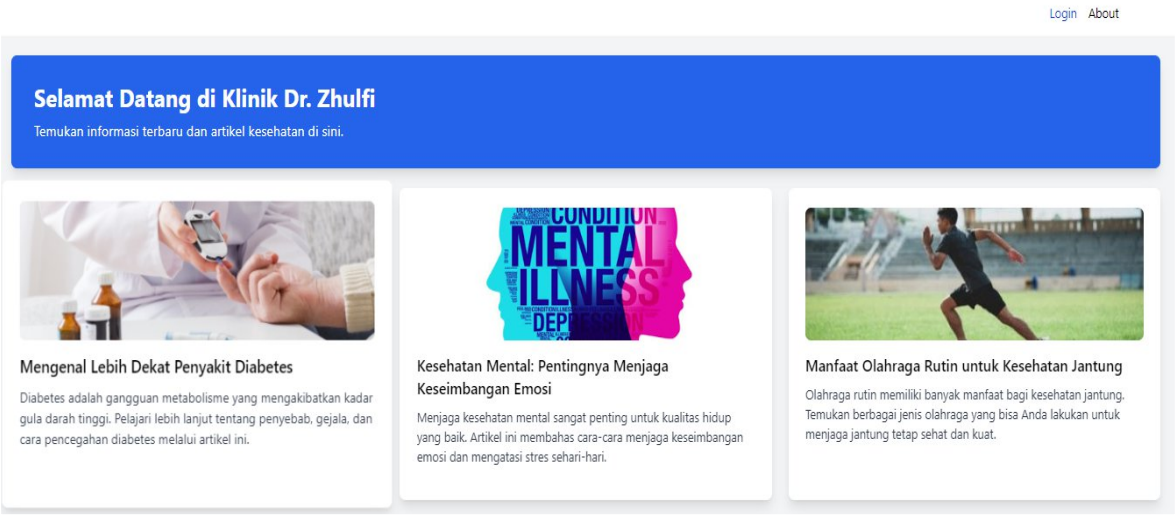

Figure 1. Home Page

Login Page

The login page is an important component in an application that serves as a starting point for users to access features that require authentication. This page is usually designed with a simple and intuitive interface to make it easier for users to log in. The login page is designed to provide access to the application system safely and efficiently. Two main inputs must be filled in by the user, namely the "Username" and "Password" columns. This input allows users to enter credentials that have been registered in the system. In addition, this page is equipped with a "Login" button that functions to process the information entered and verify user credentials against the data stored in the database. The appearance of the incoming goods data page is presented as follows.

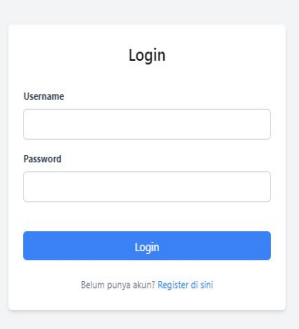

Figure 2. Login Page

Register Page

The register page is a component that allows new users to create an account and access the application. This page is designed to collect information required in the user registration process and ensure that the process runs smoothly and safely. The register page is designed to facilitate the creation of a new account with a simple and intuitive interface. Several input fields must be filled in by the user, including "Username", "Full Name", and "Password". The "Username" and "Full Name" columns are used for identification and communication with the user, while the "Password" column functions to maintain account security by requiring the user to create a password.

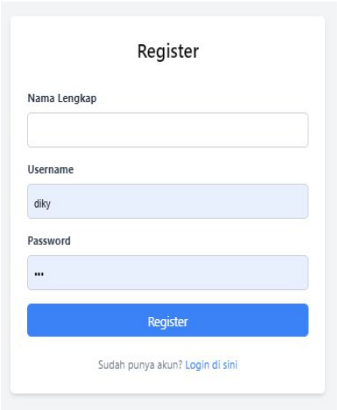

Figure 3. Register Page

Home Page

The Home User page is the main display given to users after successfully logging into the application. This page is designed to provide easy and quick access to the main features available to users. At the top of the page, there is a navigation menu that allows users to move between various sections of the application. This page is also limited to only a few accessible features, such as registration forms and viewing queue lists. In addition, this page also displays clinic-related information, such as location photos and location sharing links. Overall, the home page is designed with an intuitive and responsive interface, ensuring that users can easily navigate and access the features they need without any obstacles. A clean and organized appearance helps improve the user experience. The appearance of the damaged goods data page is presented as follows.

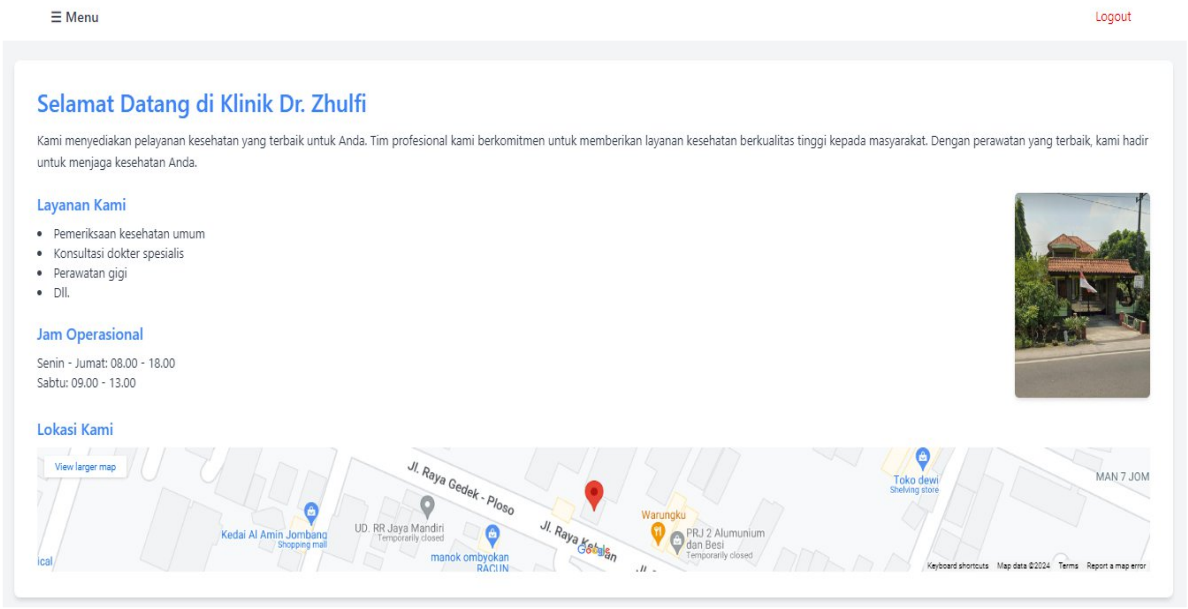

Figure 4. Welcome Page

Patient Queue Page

This page is designed to provide easy and fast access to patient queue information, with a search or filter feature that allows staff to quickly find patients by name, queue number, or status. In addition, the responsive interface ensures that this page can be accessed well on various devices, from desktops to mobile devices, thus supporting flexibility in patient queue management.

The design of the patient queue page ensures that the process of monitoring and managing the queue runs efficiently, with a clear and organized display that helps medical and administrative staff in carrying out their duties effectively. The appearance of the stock report page is presented as follows.

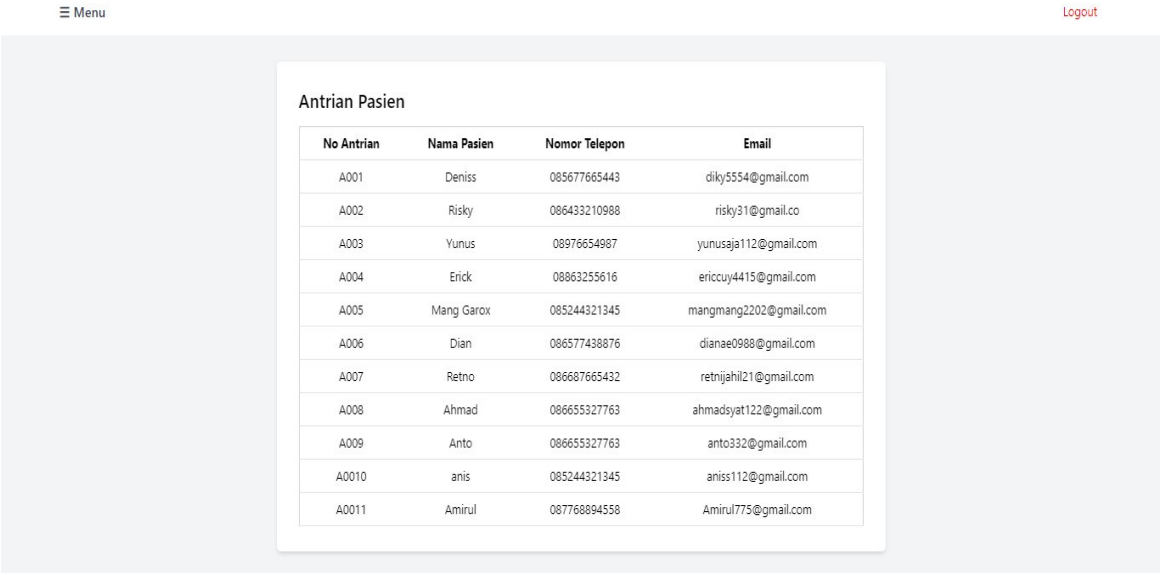

Figure 5. Payment Table

Registrant Data Page

The Registrant Data page displays all patient data that has been assigned a queue number. This page is different from the queue page because on this page, users can manage patient data more completely, including editing, deleting, and adding new data as needed. The appearance of the incoming goods report page is presented as follows.

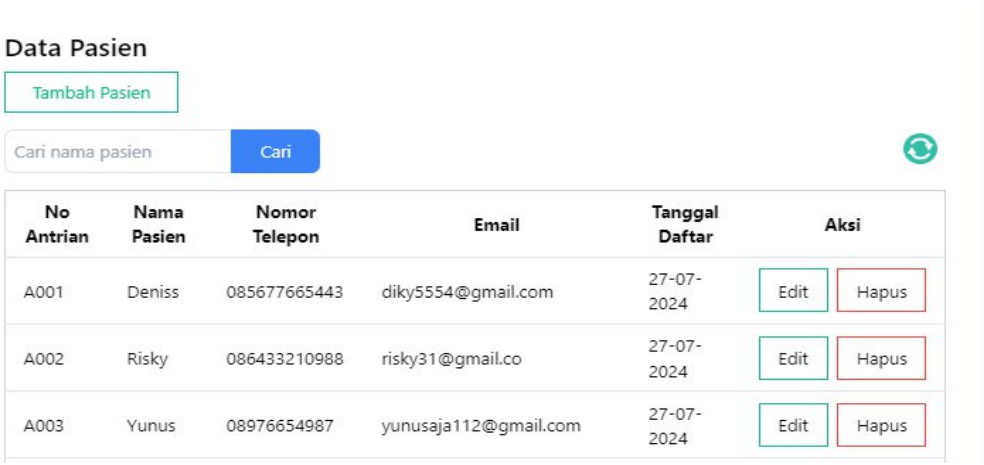

Figure 6. Registrant Data Page

Patient Diagnosis Page

The Patient Diagnosis page is a page where users can diagnose the patient's illness and determine the medication needed. Through this page, users can enter or update diagnosis information directly, check the patient's health condition, and recommend appropriate treatment. With an interface designed for ease of use, this diagnosis page simplifies the medical assessment process and ensures that each patient receives the right treatment based on the latest data.

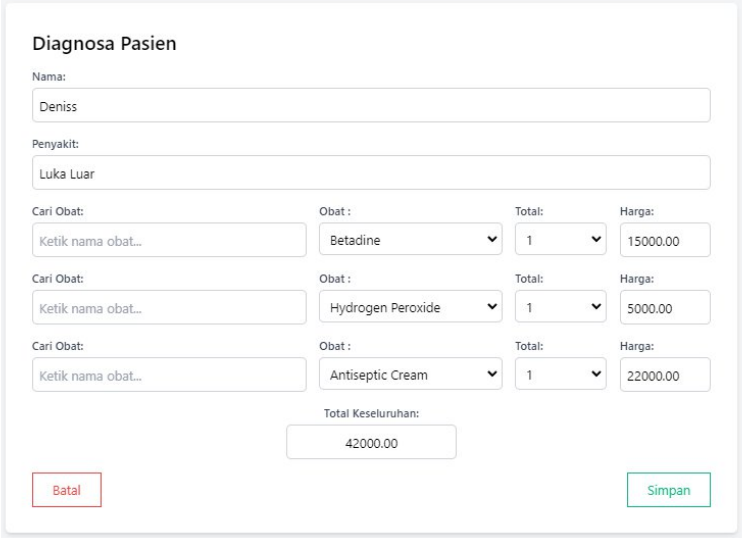

Figure 7. Patient Diagnosis Page

Medicine Detail Page

The Medicine Detail page is a page that contains details about the available medicines. On this page, users can view important information about each medicine, including the name of the medicine and the available stock. This page is designed to provide a comprehensive overview of the medicine inventory status, allowing users to easily monitor the price and availability of the medicine. With information presented clearly, this page supports stock management and purchasing decision making, ensuring that medicine data is always up to date and accurate. The appearance of the damaged goods report page is presented as follows.

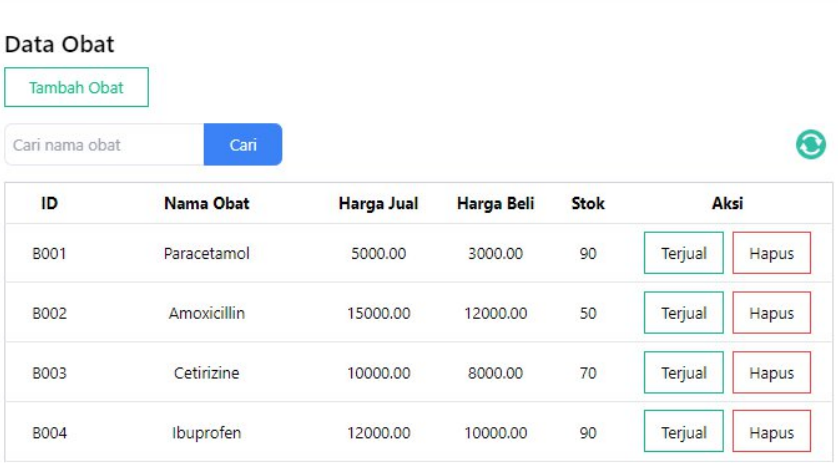

Figure 8. Damaged Goods Report Page

Discussion

It is recommended to add automatic notification features that can remind patients about schedules, payments, and medication reminders, as well as develop mobile applications or responsive versions to facilitate access to information for staff and patients. Data security should also be strengthened by implementing encryption, multi-factor authentication, and periodic security audits to protect patient personal data. In addition, staff training and regular feedback collection are needed to ensure that the system can be used effectively and continues to evolve according to user needs. Here are some trials conducted by researchers as follows:

Table 1. Sistem Testing

No	Tested Function	Testing Method	Interface Description	Result
1	Login Link	Click the login link on the homepage	Redirects to the Login Form as expected	Accepted
2	Login Button	After entering credentials, click the login button	Redirects to the main page as “admin” or “user”	Appropriate
3	Register Link	Click the “Register here” link below the login button	Redirects to the Registration page as expected	Accepted
4	Register Button	After filling in the form, click the register button	Successfully redirects to the Login Form	Accepted
5	Register as “User”	Fill in the data on the register page and click register	Redirects directly to the queue page	Accepted
6	Add Patient Button (Admin)	Click the Add Patient button from the Menu	Redirects to the Patient Registration page	Accepted
7	Edit Registrant Data Button (Admin)	Click the Edit button from the Menu - Registrant Data	Redirects to the Edit Patient Data page	Accepted
8	Save Button on Edit Patient Data	Modify data then click Save	Data is updated and returns to the Registrant Data page	Accepted
9	Cancel Button on Edit Patient Data	Click the Cancel button	No data change and returns to the Registrant Data page	Accepted
10	Search Button	Enter a name and click the search button	Displays only the searched name	Accepted
11	Delete Registrant Data Button	Click the Delete button on the Registrant Data page	The relevant data is deleted	Accepted
12	Refresh Button	Click the Refresh button	Previously hidden data reappears	Accepted
13	Diagnosis Button	Click the Diagnosis button	Redirects to the Patient Diagnosis Form	Accepted
14	Add Medicine Button	Click Add Medicine in Menu - Transactions - Medicine Details	Redirects to the Add Medicine Form	Accepted
15	Sold Medicine Button	Click the Sold button in the medicine detail menu	Redirects to the Sold Medicine Form	Accepted
16	Payment Detail Button	Click the Detail button in Menu - Transactions	Pop-up displays the payment bill details	Accepted
17	Print Receipt Button	Click the Print Receipt button in Menu - Transactions - Payment - Detail	Redirects to a PDF page containing the bill receipt	Accepted

Based on the system testing results shown in Table 1, it can be concluded that all the main functions implemented in the website-based clinic management system have run as expected. All features, from the login process, registration, patient data management, diagnosis, drug transactions, to payments, show the results "Accepted" or "Appropriate". This shows that the system can be used operationally well. The login and registration features function optimally, directing users to the appropriate page based on the type of user (admin or user). This shows that the authentication system is running correctly. The patient data registration and management features also run according to their functions. The process of adding, editing, and deleting patient data can be done smoothly, which is a significant improvement compared to the manual process previously used at Dr. Zhulfi Clinic.

In addition, the search and data refresh features allow admins to easily manage large amounts of data, especially when facing a spike in patients. The diagnosis and drug transaction features also work well, making it easy for officers to record patient medical history and drug needs in a structured manner. The pop-up payment details and receipt printing features show that the system has integrated the service and financial processes in one efficient flow. This is very important in an effort to speed up the payment process and reduce patient queues, which were previously one of the main problems due to the manual system.

With all these features functioning, this system has generally been able to overcome problems previously faced by clinics, such as service delays, data recording errors, and long waiting times. The success of this system testing is in line with the statement from (Nugroho, 2021) which states that the implementation of a website-based management information system in health services can increase the efficiency and effectiveness of clinic operations. However, to ensure that the system can continue to develop according to user needs, developers are advised to add automatic notification features such as consultation schedule reminders, payment reminders, and medication reminders for patients. In addition,

developing applications in a mobile or responsive version is also an urgent need, given the high use of mobile devices by patients and staff.

In terms of data security, the implementation of data encryption, multi-factor authentication, and periodic security audits is important to implement so that patient data remains well protected, as stated by (Handayani, 2020) that data security is a crucial aspect in health information systems. To support maximum use of the system, regular training for clinic staff also needs to be carried out. That way, the potential for errors in using the system can be minimized, and users can take advantage of all system features optimally. In addition, collecting feedback from users regularly can also be the basis for updating or improving the system according to real needs in the field.

CONCLUSION S

The Website-Based Clinic Management System Development Project for Optimizing Patient Services has succeeded in achieving its main objective of creating an effective website-based platform in managing clinic operations as a whole. This system is designed with various features that support clinic administration, from patient registration, diagnosis, medication management, to bill tracking and payments. This system allows for more structured and efficient patient data management, provides convenience in the registration and diagnosis process, and optimizes drug inventory management. With features such as patient registration pages, patient detail pages, patient diagnosis pages, and drug stock management, this system ensures that patient and drug information is well managed and always up to date. The bill integration and payment history pages also simplify financial administration, allowing for transparent and accurate transaction tracking. Overall, this project has succeeded in building a comprehensive and effective system, which is expected to make a significant contribution to improving clinic management and patient services. This system shows great potential in improving operational efficiency, reducing administrative burdens, and improving patient experience at Dr. Zhulfi Clinic.

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