Clinic Management System

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Abstract - A Clinic Management System (CMS) is a web-based application designed to streamline the management of clinic operations, including patient registration, appointment scheduling, medical records, and billing. The system utilizes PHP for server-side scripting, allowing for dynamic content creation and seamless interaction with the database. MySQL is used as a relational database management system (RDBMS) to securely store and manage patient, appointment, and medical record data. Visual Studio Code (VS Code) serves as the primary integrated development environment (IDE) for building and debugging applications, offering features such as syntax highlighting and version control integration. This CMS aims to increase efficiency, reduce administrative errors, and improve the overall experience for patients and healthcare providers.

1. INTRODUCTION

Health in a person's life reflects a prosperous living condition, which can allow the individual to lead an active life. Health is an integral part of well- being that must be given to every individual as a human right. Health plays a crucial role in relation to human productivity, and everyone needs a healthy life to ensure survival. There are four main factors that have an impact on the level of human health, namely family genetic factors, environmental conditions,

In Indonesia, it is a factor that must be improved in the world of health is to improve the quality of the service system with a good one. Health services have a very important role in the national health system and interact directly with the community. In accordance with Law Number 36/2009 concerning health, health service facilities refer to places where the government or the community makes efforts to maintain health and improve people's welfare. Health services include many aspects such as health care, diagnosis, and treatment of diseases and disease prevention.

2. LITERATURE REVIEW

In recent years, research on patient data management in healthcare has grown rapidly with the application of various technologies to improve efficiency. Matusea and Suprianto (2021) and Utami and Apridiansyah (2019) developed patient registration systems with search algorithms, which allow for quick searches of patient data despite the large amount of data. These two studies show the importance of search algorithms in making it easier to manage health data in healthcare centers, especially when the amount of data to be managed is very large, as found in Puskesmas or hospitals.

On the other hand, research by Agustino et al. (2022) who used the SDLC approach with the waterfall model underlined the importance of a systematic methodology in developing clinical applications. This model makes it easier to create and maintain clinical information systems on an ongoing basis. Similarly, Istiqomah and Irawati (2023) applied a search algorithm in managing medical data at a primary clinic, which was very helpful in dealing with large volumes of data. Overall, these studies show that technology,

whether through algorithms, application design, or system development methodologies, is instrumental in improving the efficiency and effectiveness of data management in healthcare.

3. METODHOLOGY

The development of an application requires careful planning to produce an application that runs well and smoothly. Therefore, it requires a model in making applications, and for the applications that our group creates, we will use the Waterfall model, where this model will be done sequentially from the top, without being able to do other steps first to make it more structured. The following is an overview of the waterfall model:

Figure 3.1. Waterfall Model
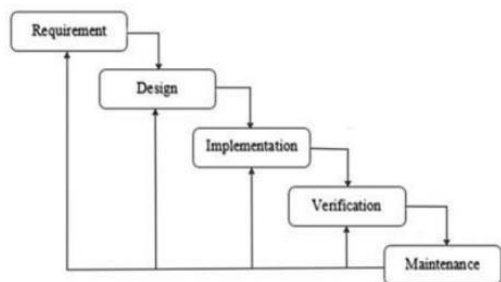
Analysis is an act of collecting, searching and researching a problem that will be discussed clearly so that it is deeper to solve a problem. In the analysis stage, our group analyzes in the Clinical Management System the results of:

a.   User Admin :
   • Input medical record data
   • Input doctor data

b.   Patient User :
   • Input patient data yourself.

In making it, our group decided to use PHP programming language, with MySQL database from XAMPP. For the tools, we used Visual Study Code.

1.   PHP
   PHP is a server-side programming language used to develop dynamic web applications. PHP allows developers to manage user data, interact with databases, and generate HTML content dynamically.

2.   MySQL
   MySQL is a relational database management system used to store, manage, and retrieve data using SQL. MySQL is popular in web application development due to its speed, scalability, and ability to handle large amounts of data.

3.   Visual Studio Code
   Visual Studio Code (VS Code) is a lightweight and powerful source code editor used for writing, editing, and debugging code. VS Code supports a variety of programming languages, including PHP, and comes with features such as IntelliSense, extensions, and Git integration.

For group design, we will first create a flowchart so that it is neatly arranged and follows the rules in creating an application. The following is a flowchart for patient registration :

Figure 3.2. Patient Definition Flowchart
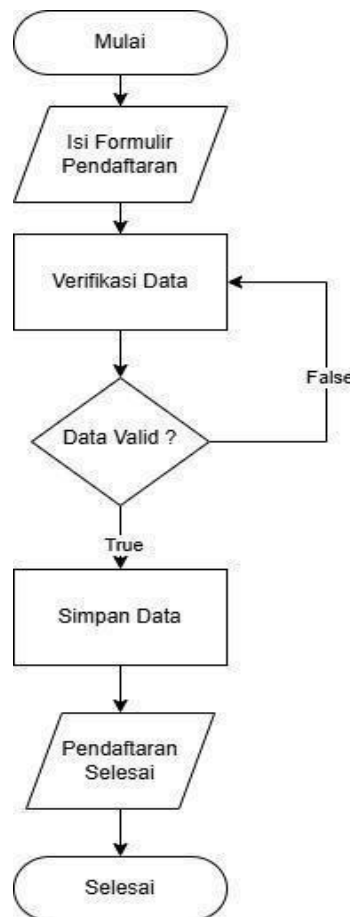

From the flowchart above is a flowchart for patient registration, where patients will register by filling out the required personal data form first, and will be stored in our Clinic Management System database. Then below is a flowchart for medical records, where patients after checking with a doctor, the doctor will fill out a medical record form to inform the patient's illness. Next,

this process describes the flow of recording patient medical data by doctors. The stored medical record data can be accessed again if needed at the next visit.

Figure 3.3. Medical Record Flowchart
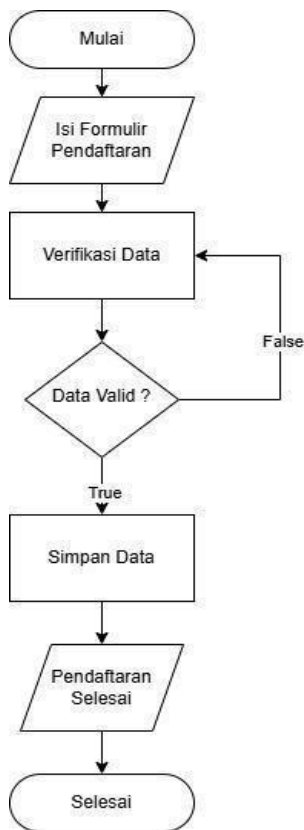
Next, process describes the flow of recording patient medical data by doctors. The stored medical record data can be accessed again if needed at the next visit. The following is a usecase for administration, where this administration can access to the clinic application system.

Figure 3.4.3 Administrative Usecases
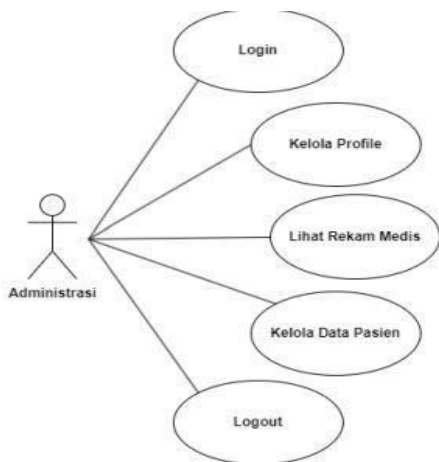
The explanation of the administrative use case above, the scenario is as follows:

1. Admin can log in with gmail and password
2. Admins can manage their own profiles
3. Admins can check medical record data
4. Admin can manage patient data

4. RESULT AND DISCUSSION

This e-clinic application system is designed using mysql and php native, not yet using the process framework, it is divided into two **frontend** and **php native.** with php programming language, for frontend and userinterface using templeate bootstraps css, and for databases using My SQL. The source code that will be included in this writing is the source code for the login feature, the start page, and the patient data page.

Frontend The home landing section of the clinic uses CSS, Java script, and Bootstrap v, where the frontend integration uses the Typescript programming language called with a PHP connection.

Figure 4.1. Source code Home Page

From figure 4.1.1.1, the source code in this image is the source code in the home landing or homepage section of the group 8 e-clinic application.

Figure 4.2. Source code Login system section
From the image 4.2 the source in this image is for the functional login on the system e clinic.

Figure 4.3. Source code Patient data section

From figure 4.3 the source in this figure is for the functional system e clinic which includes patient data and patient history data.

Figure 4.4. Page Dashboard SMK

In this section are the results of each experiment carried out both with a positive test scenario and with a negative test. This testing process is carried out by installing the application on a computer device. In this case, the author conducts a test using the blackbox testing method, to see if the functions in the application run well or not. E application self-clinic from User Admin.

Table 4.3.1. Admin User Role Test Results

Tested Features	Scenario Testing	Result Testing	Conclusion
Positive Test			
Login features	Log in using an account that has Integrated	Info view"login successful" is redirected to Dashboard	passed
Dashbo ard features	Log in using username and account that Integrated	Displaying data data patient and patient patient and patient history history	passed
Feature Service List	Filling in data to be a patient at clinic	Can do input Input Data that appropriate	passed

5. CONCLUSION

Based on the results of the test and the description mentioned above. Group 6 made a conclusion that the e-clinic application has quite complete feature features, a structured login, and patient history registration section and a minimalist and simple display. For future development, maybe group 6 will improve the e-Clinic application using modern frameworks such as Laravel or React to improve development efficiency and scalability of the system. In terms of interface, a more responsive and user-friendly design can be optimized to support various devices.

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