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Application Development of Coronary Heart Disease Expert System Using Android-Based Agile Scrumban Method

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ABSTRACT

The purpose of the research is to develop an application for coronary heart disease diagnosis expert system using the Android-based Agile Scrumban method. Coronary heart disease is one of the causes of death in the world, so an effective and efficient application is needed in providing information and early diagnosis as well as early symptoms so that it can save many lives. The Agile Scrumban method was chosen because of its flexibility in project management and its ability to handle changes in user needs quickly. The application is developed with requirements analysis, interface design, implementation, and testing. The application developed can make it easier for users to access information related to symptoms, risk factors, and recommendations for actions that need to be taken. The results of the study show that the application has succeeded in providing an accurate initial diagnosis and getting a positive impact response from users. Community diagnostic applications can be more aware of the risk of coronary heart disease and take the necessary preventive steps. This study shows the potential of the application of information technology in the health sector to increase awareness and handle coronary heart disease more efficiently. Android-based applications can make it easier for users of coronary heart disease to make it more efficient because they can be used on android devices.

Keywords: Application; Expert System; Coronary Heart Disease; Android-based

1. INTRODUCTION

Based on data from the World Health Organization (WHO), coronary heart disease is one of the leading causes of death in the world. Lifestyle Increasing unhealthy lifestyles, such as poor diet, lack of physical activity, and stress, the number of CHD sufferers continues to increase and after the covid-19 pandemic [1] ,[2], [3], [4], [5]. Utilization of information technology [6], [7], [8], [9], Expert systems can provide fast and accurate information to users. However, many expert systems still have limitations in terms of accessibility and ease of use, especially for people who do not have a medical background [10]. The use of mobile devices is increasing so that android-based application development is needed [2], [11]. App development should not only be informative, but also easy to use and accessible anytime and anywhere.

The Agile Scrumban method, which is a combination of Agile and Scrumban, was chosen in this study to face the challenges of dynamic application development [12]. This method allows development teams to adapt quickly to changing user needs and increase collaboration in app development [13], [14]. The research methods used in the application of expert systems are designed to be more efficient and effective [15]. Based on the background analysis of the research with the aim of developing an Android-based coronary heart disease expert system application using the Agile Scrumban method [3], [16]. The application of this study is expected to make a significant contribution to increasing public awareness of coronary heart disease as well as providing useful tools for early diagnosis [17], [18], [19], [20].

2. METHODOLOGY

2.1 Research Stages

This study uses qualitative and quantitative approaches to develop an Android-based coronary heart disease expert system application. This approach allows for in-depth data collection regarding user needs as well as evaluation of the effectiveness of the developed application.

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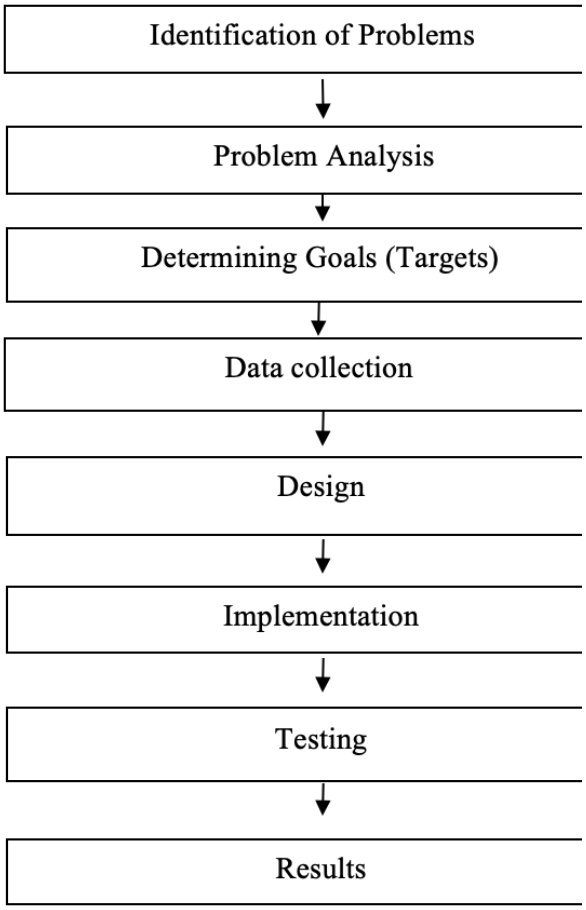

Figure 1. Research Stages

The Agile Scrumban method was chosen as the framework for application development. This method combines the principles of Agile and Scrumban to increase flexibility and collaboration within the research team to develop applications. The development process is carried out through the following phases:

1. Planning: Identify user needs and app goals through interviews and surveys of target users.
2. Design: Prototype user interfaces and design system architectures. The prototype will be tested with users to get initial feedback.
3. Implementation: Application development is done in short iterations, where each iteration results in a testable feature. Teams use project management tools to monitor progress and manage tasks.
4. Testing: Each version of the app is tested to ensure functionality, reliability, and user experience. Testing includes unit test, integration test, and system test.
5. Evaluation: Collect feedback from users after using the app. The evaluation was conducted through a questionnaire to assess user satisfaction and the effectiveness of the application in providing an initial diagnosis.

The android-based coronary heart disease diagnosis expert system application uses the certainty factor method. This application is a health service application to find out early on about the symptoms of a person with coronary heart disease. In general, this health service application provides information on symptoms that are often experienced by the wider community that can be accessed anytime and anywhere with a friendly display so that everyone can run the program easily. The purpose of creating an application for a coronary heart disease diagnosis expert system using the certainty factor method is to make it easier to present information about coronary heart disease diagnostic health services that can be used by the public for free as an early check without having to check with a doctor. This application is also only a support for early checks to help the wider community, not replace the role of cardiologists. If it is known that you have early symptoms of coronary heart disease, you must immediately consult a cardiologist.

2.2 System Development Methods

1. Use Case Admin

In the system application, the respiratory disease diagnosis expert system admin can have several menus in the system, namely login, home, user data, disease data, symptom data, solution data, user weight, rules and exit. All can be used by admins to enter data related to the system. The following is a use case of the android-based coronary heart disease expert system application using the cartainty factor method.

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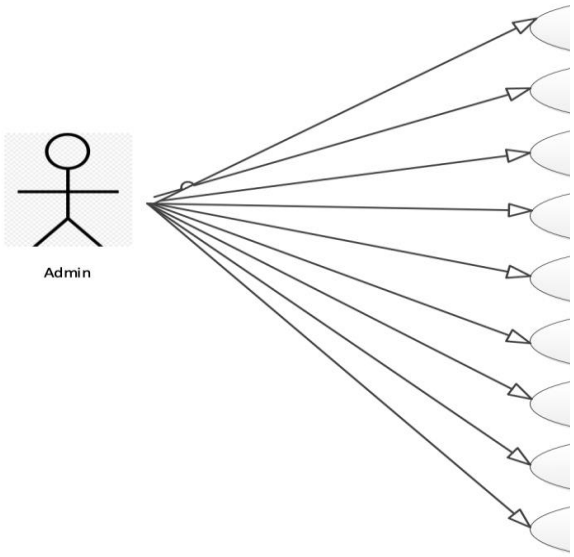

Figure 2. Use Case Admin

2. Use Case User

In the user respiratory disease diagnosis expert system application, there are several menus in the application, namely login, register, diagnosis, disease, about and logout. The following is a use case user of the android-based coronary heart disease expert system application for the cartainty factor method.

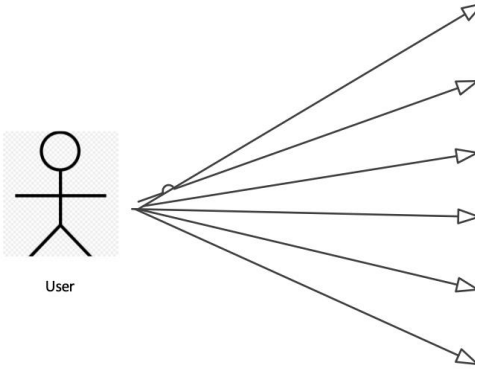

Figure 3. Use Case User

3. Activity Diagram Admin

The following is the activity diagram admin of the android-based coronary heart disease expert system application cartainty factor method.

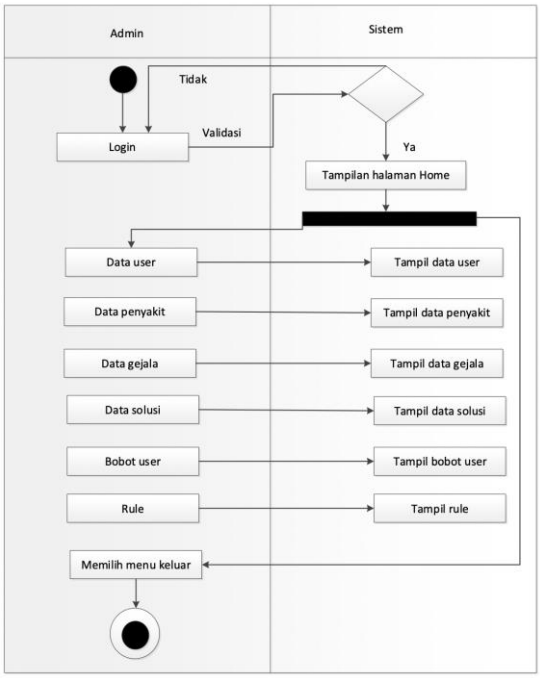

Figure 4. Activity Diagram Admin

4. Activity Diagram User

The following is the user activity diagram of the android-based coronary heart disease expert system application of the cartainty factor method.

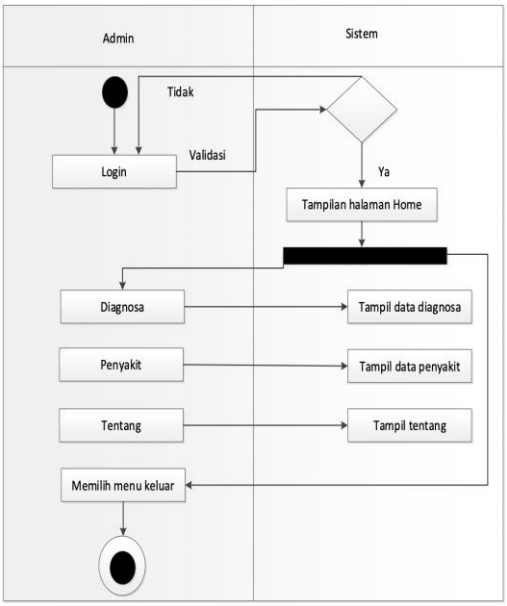

Figure 5. Activity Diagram User

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4. Class Diagram

In the application of the respiratory disease diagnosis expert system, there are 7 tables that are interconnected with each other. The tables are admin, user, disease, symptoms, solution, user weight, and rule. The following is the admin diagram class of the design and build of an expert system application to diagnose respiratory tract diseases using the android-based cartainty factor method.

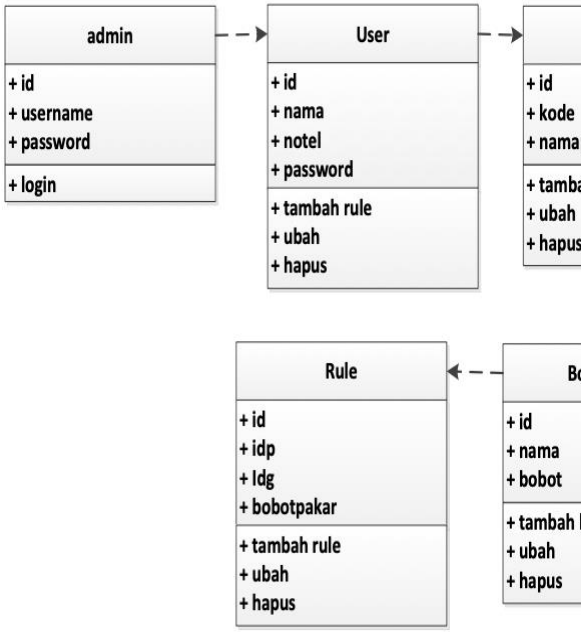

Figure 6. Class Diagram

3. RESULTS AND DISCUSSION

1. Home Menu View

The following is the view of the home admin page of the expert system to diagnose respiratory tract diseases using the android-based cartainty factor method.

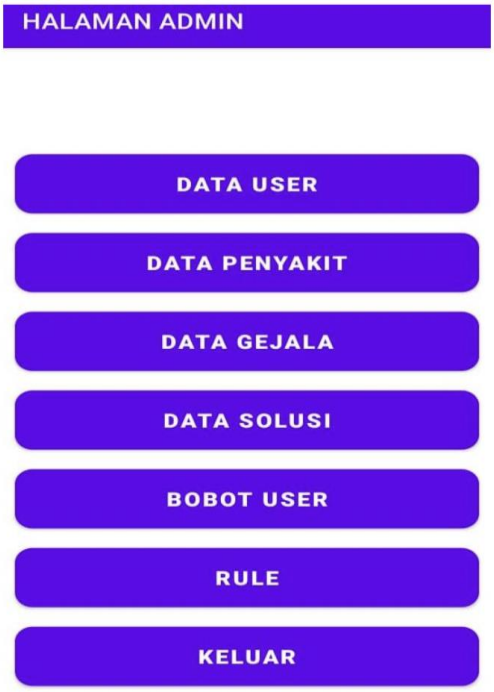

Figure 7. Home Menu

2. User Data Display

In the application of the expert system to diagnose coronary heart there is a user data menu. Which is entered during registration and after the account is completed. Can log in with usernam and password.

The following is the view of the home admin page of the expert system to diagnose respiratory tract diseases using the android-based cartainty factor method.

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Figure 8. Data User

3. View Add Solution

In the application of the expert system to diagnose coronary heart there is a menu to

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add Solutions on the admin account. Admins can input diseases and disease data as well as solutions on the application of an andorid-based internal medicine diagnosis expert system that can be viewed by users.

The following is the display of the home admin page of the expert system to diagnose respiratory tract diseases using the android-based cartainty factor method

Figure 9. Tambah Solusi

4. CONCLUSION

The conclusion of this study is that an application of an expert system for diagnosing respiratory tract diseases using the cartainty factor method can provide convenience for the public to find out information about coronary heart disease so that it can reduce the death rate with coronary heart disease cases. The public can easily find out the symptoms of coronary heart disease so that they can easily monitor a balanced lifestyle and exercise. without having to go to a pulmonary specialist. The application of the coronary heart disease diagnosis expert system is more effective using the Agile Scrumban method. Scrumban's Agile method has proven to be effective in the development of these applications, allowing development teams to adapt quickly to changing user needs and improve collaboration in the development process. The resulting app has an intuitive and easy-to-use interface, making it accessible to the general public with a wide range of backgrounds, including those with no medical knowledge. The app is capable of providing an accurate initial diagnosis based on the symptoms entered by the user. This can help raise public awareness about the risk of coronary heart disease and encourage preventive measures. The test results showed that users gave positive feedback regarding the app's functionality and ease of use. This shows the potential of the app to be widely adopted among the public. With this application, it is hoped that it can contribute to increasing public knowledge and awareness about coronary heart disease, as well as providing useful tools for early diagnosis.

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