DEVELOPMENT OF HOME CARE ONLINE APPLICATION IN CIANJUR REGENCY WITH CLOUD MESSAGING TECHNOLOGY

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ABSTRACT

Home Care Services are continuous and comprehensive services provided to individuals and families in their homes that aim to improve, maintain or restore health and minimize the consequences of illness. Increased chronic diseases that require long-term care are appropriate if homecare-based treatment is carried out. Based on the distribution of questionnaires conducted on 50 people, which was directly distributed that 86.65% of the average community were consumers who often needed care services. Based on the results of another questionnaire randomly distributed to 30 respondents, 62.5% of the respondents stated that they had difficulty in determining the treatment that was in line with expectations, 25% had difficulty with health care and 12.5% had other difficulties. With so many problems, people need other alternatives. Google Cloud Messaging (GCM) technology serves to convey information in the form of short messages (Notification Message) to Android Mobile devices that make it easier to deliver messages for free and received in realtime. The method used in this application uses the Waterfall method which is divided into stages of analysis, design, coding and testing. Data collection was carried out in the form of observations, literature studies, questionnaires and interviews. Based on the results of questionnaires distributed to 30 respondents, it was found that the results of the category were positive towards the research objectives.

Keywords: Home care, Google Cloud Messaging (GCM), Android

1. INTRODUCTION

1.1 Background

Home Care Services are continuous and comprehensive health services provided to individuals and families in their homes that aim to improve, maintain or restore health or maximize the level of independence and minimize the consequences of illness.

Increased PTM (Non-Communicable Diseases) causes many people who need health services, especially in cases of degenerative diseases (elderly diseases) that require long-term care, so the impact on increasing cases of home care. And to speed up service and healing, nurses are needed in accordance with expertise with several advantages possessed with the right type of care. But some people just think, that good care can only be done in hospitals and large hospitals. Whereas in fact some people feel that being treated in the hospital makes it uncomfortable because it is limited by the rules.

The home environment is still felt the most comfortable place compared to the Hospital. But due to a lack of information about home care, there are still many people who go to the hospital for further treatment. Even though the community has to go to the hospital, especially in Cianjur Regency, the distance is very far and the number of queues in the hospital. Though treatment can be done at home by calling nurses at home with home care services. And as for some people who are lazy to come to the hospital and decide not to continue further treatment because of this.

Based on the description above, an application will be built to assist in providing health services and recommendations for nearby nurses and help determine the care according to needs with nurses according to their expertise by using a home care application that utilizes Global Positioning System (GPS) technology, users can find out their position and the position of the object around it.

Google Cloud Messaging (GCM) is a project developed by Google Inc. GCM itself serves to convey information in the form of short messages (Notification Message) to Android Mobile devices. GCM makes it easy for users to deliver messages for free and is not related to the amount of a message sent and the delivery of messages sent by GCM can be received in realtime. Therefore, based on the description above, a mobile android application was built for the people of Cianjur Regency with the title "Development of Online Home Care Applications in Cianjur Regency with Cloud Messsaging Technology".

1.2 Problem Identification

Based on the above background, the problem identification is obtained as follows:

1. *The difficulty of the community to find nurses who can take care of their homes located in Cianjur Regency.*
2. *How to make it easier for consumers to find nurses who can take care of homes in Cianjur Regency, because there are many nurses who are not in accordance with their expertise and with various types and prices.*
3. *How do consumers get service quickly and efficiently without wasting time.*
4. *How do nurses tell consumers about the services provided with the advantages of each nurse.*
5. *How do nurses offer the types of care that are made based on their expertise.*
6. *How nurses and consumers can make payment transactions quickly and safely.*

1.3 Purpose and Purpose

The purpose of this final project is to build an application that utilizes Cloud Messaging technology for Home Care Online in the Android-based Cianjur Regency. The purpose of this final assignment is:

1. *Provide convenience to consumers in choosing care according to needs.*
2. *Showing the location of the closest nurse position to the position of the consumer.*
3. *Directions to nurses to reach consumers with the fastest distance.*
4. *Providing notification to nurses if there are consumers who need treatment.*
5. *Provide recommendations for nurses that are in accordance with their expertise.*

1.4 Limitation of Problems

With some of the problems above, it is given a limit to the scope of the problems to be studied to maximize the results of the study, including:

1. *The application built will only be implemented in Cianjur Regency.*
2. *Applications built on mobile with the Android platform.*
3. *The mobile device used must have GPS facilities.*
4. *The target of use includes all people who are looking for nurses to perform care at home based on needs and according to expertise.*
5. *The features contained in this application are showing the nurses who are closest to consumers, listing the cheapest prices to the most expensive, the availability of items according to consumer needs, either only treatment according to action or overall care.*
6. *The system built will be implemented on an Android smartphone with a minimum operating system 4.4.*

2. ANALYSIS OF DESIGN AND IMPLEMENTATION

2.1 System Analysis

System analysis aims to identify the problems contained in the system and determine the needs of the system built. The analysis includes problem analysis, non functional needs analysis, and functional needs analysis.

2.1.1 Problem Analysis

Home Care is a continuous and comprehensive health service provided to individuals and families in their homes that aims to improve, maintain or restore health or maximize the level of independence and minimize the consequences of illness. However, there are still a number of problems that become an obstacle in the development of Home Care, namely:

1. *The difficulty of the community to find nurses who can take care of their homes located in Cianjur Regency.*
2. *How to make it easier for consumers to find nurses who can take care of homes in Cianjur Regency, because there are many nurses who are not in accordance with their expertise and with various types and prices.*
3. *How do consumers get services quickly and efficiently without wasting time.*
4. *How do nurses tell consumers about the services provided with the advantages of each nurse.*
5. *How do nurses offer the types of care that are made based on their expertise.*
6. *How nurses and consumers can make payment transactions quickly and safely.*

2.1.2 Nurse Search Analysis

Nurse Search is a search that is given to general users to get nurses. The steps in providing nurse recommendations are as follows:

1. *Determine the criteria for nurses in advance, as for the desired criteria is Manners, Expertise, Taste, Gender, Experience.*
2. *Search for the location of the nurse in the nearest distance from the search location where the distance value is obtained from the distance value on google maps using the google Direction API.*
3. *After getting the distance of each nurse location, determine the location of the nearest nurse.*

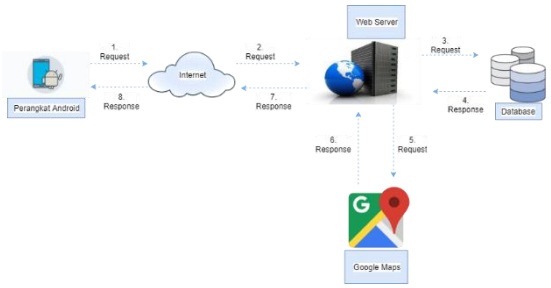
2.1.3 Analysis of Nurse Recommendations

Nurse recommendations are recommendations given to general users to get nurses. The steps in providing nurse recommendations are as follows:

1. *Seek first the nurse with criteria for manners, expertise, empathy, gender, and experience.*
2. *For one patient who is looking for the best nurse.*
3. *After getting the names of nurses, determine which nurse you want.*

2.1.4 Analysis of System Architecture

System architecture analysis aims to identify the architecture to be built. The following is the Cianjur Home Care application system architecture that will be built:



Picture 1

2.1.5 Software Requirements Specifications

Software requirements specifications consist of Software-Functional Needs Specifications (SKPL-F) and Non-Functional Software-Requirements Specifications (SKPL-NF).

2.2 Analysis of Non-Functional Needs

Non-functional needs analysis consists of hardware analysis, software analysis, and analysis of users who will use the application to be built.

2.2.1 Hardware Analysis

The system is built with hardware specifications that meet minimum requirements, including the following:

1. *Mobile System*

The system is built with hardware specifications that meet minimum requirements, including the following:

No	Hardware	Minimum Needs
1	Processor	800MHz
2	Memory	512 MB
3	Screen	3,5 inch
4	Other Devices	Internet Connection

Table 1

2.2.2 Analysis of Software

The system is built software specifications that meet the minimum standards of need, including the following:

Table 2

No	Software	Specifications
1	IDE (intergrated Develoment Environment)	Android Studio
2	Android SDK (software Development Kit)	Version 4.4 (API 19)
3	JDK (Java Development kit)	Version 7
4	Operating System	Windows 10
5	Web Browser	Google Chrome, Mozila firefox

2.2.3 User Analysis

User analysis is done to find out who users are involved in a system. In this application involves four types of users, namely nurses, patients, hospital pickets, and administrators. The following are the characteristics of the users needed:

Table 3

No	User	Characteristics
1	Nurse Finder	Understand using an android mobile device. Having the ability to use the internet.
2	Hospital Pickets	Understand using an android mobile device. Having the ability to use the internet.
3	Nurses	Understand using Android mobile devices. Having the ability to use the internet.
4	Administrators	Understand using computers. Having the ability to use the internet

2.3 Functional Needs Analysis

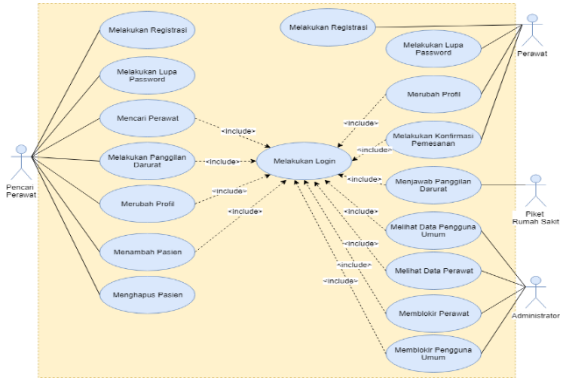
Analysis of functional requirements in the development of this system is divided into one, namely the analysis of the functional requirements of the system on the mobile platform. Functional needs analysis is done to find out what processes can later be carried out by the system.

2.3.1 *Mobile Platform Functional Needs Analysis*

Analysis of functional requirements of the mobile platform includes several UML diagrams, including use case diagrams, activity diagrams, class diagrams and sequence diagrams.

2.3.1.1 Use case diagram

The use case diagram provides a way of describing external views of the system and its interactions with the outside world. Following are the use case diagrams built:

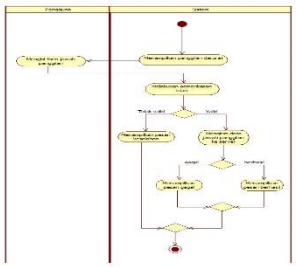


Picture 2

2.3.1.2 Activity Chart

Activity diagrams are diagrams to illustrate procedural logic, business processes and work lines. The following is an explanation of each activity diagram:

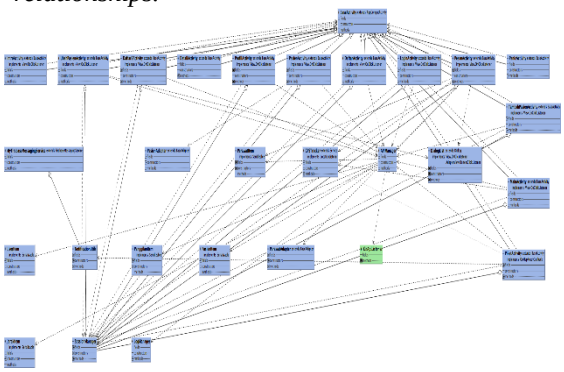
1. *Activity Diagram Log in*
2. *Activity Diagrams Perform Registration*
3. *Activity Diagram for Forgetting Password*
4. *Activity Chart Looking for a Nurse*
5. *Activity Diagram Making Emergency Calls*
6. *Activity Diagram Adds Patients*
7. *Activity Diagram Changing Patient Data*
8. *Activity Diagram Removing Patient Data*
9. *Activity Diagram Changing Profile Data*
10. *Activity Diagram Answering Emergency Calls*



Picture 3

2.3.1.3 Class Diagram

Class diagrams are diagrams to describe the types of objects in the system and the various static relationships that exist between them. In addition to showing the properties and operations of a class and the limitations contained in the object's relationships.

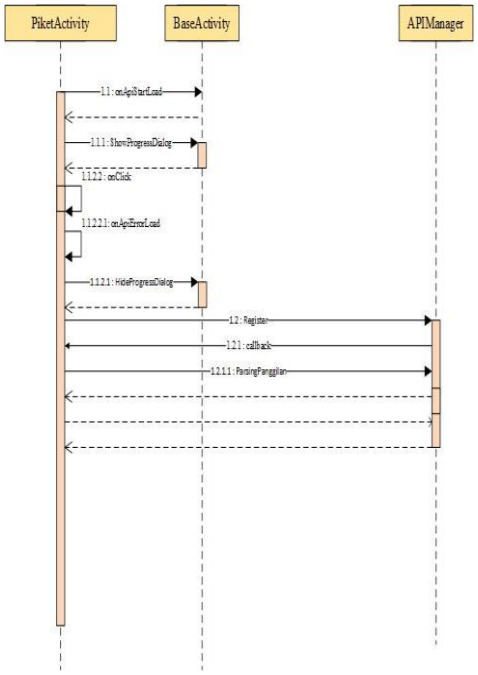


Picture 4

2.3.1.3 Sequence Diagram

Sequence diagrams are diagrams that specifically describe behavior as a single scenario. The diagram shows a number of sample objects and messages that pass through these objects in the use case. The following is a sequence diagram for applications built:

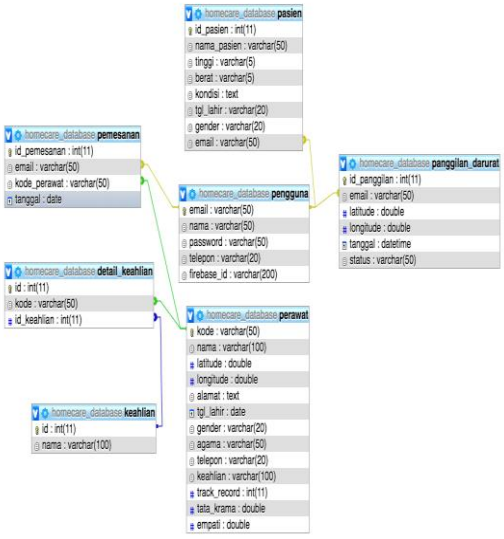
1. *Sequence diagram Login*
2. *Sequence diagram Registering*
3. *Profile sequence diagrams*
4. *Forgotten sequence diagram*
5. *Nurse Seeker sequence diagram*
6. *Add Patient Sequence Diagram*
7. *Change Patient sequence diagram*
8. *Sequence diagrams Find Nurses*
9. *Emergency call sequence diagrams*
10. *Answer sequence diagrams*



Picture 5

2.4 Relationship Scheme

The Database Relations table describes the relationships between tables in this research database. The following Database Relations Table:



Picture 6

2.5 System Design

System design is carried out after the analysis phase is carried out. System design is a depiction, planning, and sketching of several elements in the software that is built:

1. *Login*
2. *Registration*
3. *Forgot password*
4. *Save Patient Data*
5. *Change Patient Data*
6. *Change Patient Data*
7. *Patient List*
8. *Nurse Search*
9. *Emergency Calls*
10. *Answer Emergency Calls*

Table 4

Request	Parameter
Http://homecarecianjur.com/api/panggilan_darruat.php	Email Latitude Longitude Kondisi Alamat Waktu Telepon

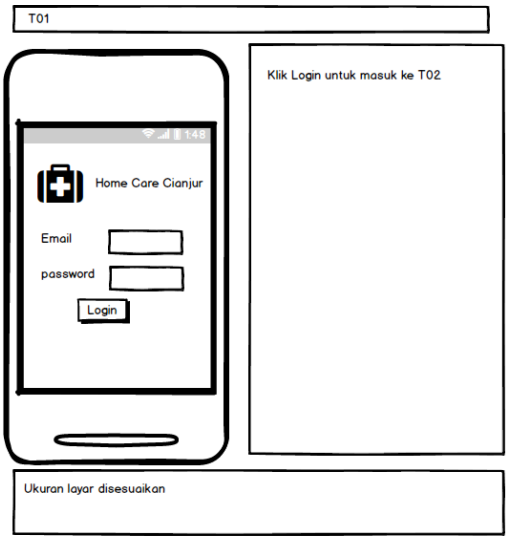
Response

```
{
  "panggilan": [
    {
      "email ": "",
      "latitude ": "",
      "longitude": "",
      "kondisi": "",
      "alamat": "",
      "waktu ": "",
      "telepon": ""
    }
  ]
}
```

Response Gagal

```
{
  "SUCCESS": "FAILED"
}
```

2.6 Design interface



Picture 7

3 RESULTS AND DISCUSSION

3.1 Alpha Testing Results

Based on the results of alpha (functional) testing with the above test cases it can be concluded that the development of the Homecare Online application has no process errors and functionally outputs that are as expected.

This test allows system analysis to obtain a set of input conditions that will work on all program functional requirements. In blackbox testing, the user or tester treats a program as a black box that is not known what the contents of the box are, the user only provides various kinds of input data which then receives output data to suit the system functionality, which consists of:

1. Functional testing scenario

Application built using the blackbox method. The following table explains the components or features to be tested:

Table 5

No	*Komponen Test*	*Scenarios*	*Testing*
1.	*Login Page*	*Enter the correct email data and password*	*Blackbox*
		Input incorrect email and password data	*Blackbox*
		Blank data input	*Blackbox*
2.	*Registration Page*	*Email data input, full name, telephone number and password*	*Blackbox*

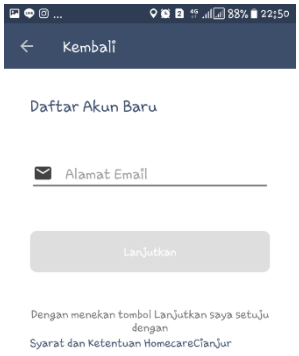
1. Test results

Displays the results of application testing that are carried out according to the plan and test scenario. Obtained the results of a successful display that is as expected.

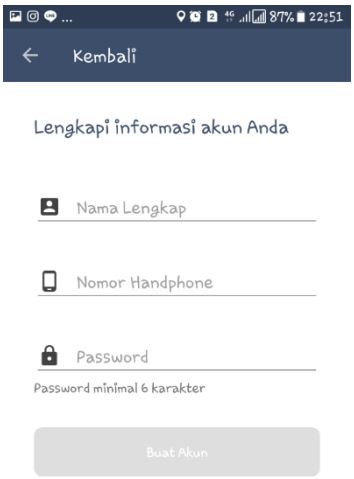
2. Interface Implications

Interface implementation aims to change the results of the analysis into real forms. The interface is the most important part of the development of android mobile applications for online homecare.

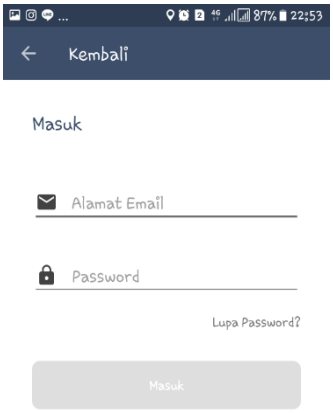
The implementation of the interface in the development of this application consists of the user interface (patient), nurse, administrator and hospital picket. Following is the implementation of the interface of the system built:



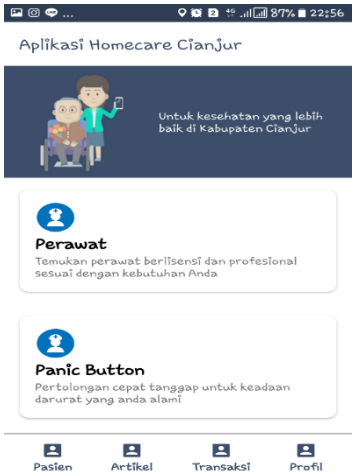
Picture 8



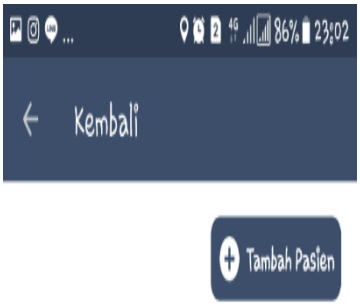
Picture 9



Picture 10

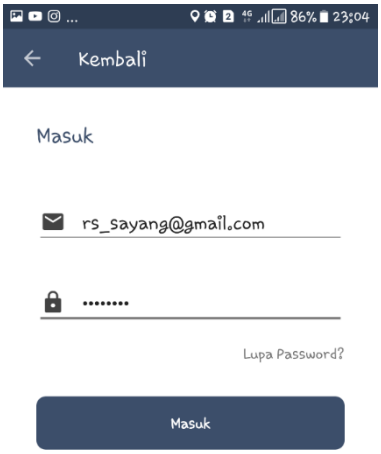


Picture 11



Picture 12

Picture 13



Picture 14

Picture 15

3.2 Beta testing

Beta testing which is part of acceptance testing or User Acceptance Testing (UAT) is an objectively conducted test that is carried out directly by the application user. The technique used is a questionnaire.

Based on the results of the questionnaire (beta testing), it can be concluded that:

1. This Homecare Online application can see people's interest in this application.
2. This application can fulfill its purpose to facilitate users who need maintenance services.
3. This application makes it easy for users to find nurses with features that make it easier and understandable.
4. This application allows users to get care as needed.

5.This application makes it easier for users to increase trust by showing the position of nurses according to position.

4 CONCLUSIONS AND SUGGESTIONS

4.1 Conclusions

Based on the results of the beta questionnaire testing conducted with 30 Cianjur people and interviews, the following conclusions were obtained:

1. *This application provides convenience to consumers in choosing care according to needs.*
2. *This Homecare application makes it easy to show the location of the closest nurse position to the position of the consumer.*
3. *This Homecare application provides guidance to nurses to reach consumers with the fastest distance.*
4. *This Homecare application provides notification to nurses if there are consumers who need treatment.*
5. *This Homecare application provides nurses recommendations that are in accordance with their expertise.*

4.2 Suggestions

Homecare application that is built is an application that focuses on determining the recommendation of the nearest nurse and according to the expertise they have as well as recommendations for panic botton. This application still has many flaws, therefore there are some suggestions that can be used as a reference for the development of this software so that it is more useful in the future in a better direction to support the content of this application so that it can keep abreast of technology and facilitate the public. The suggestions for homecare application development are as follows:

1. Add payment features.

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