THE DEVELOPMENT OF LOCATION BASED SERVICES MOBILE APPLICATION FOR PROVIDING HEALTH FACILITIES INFORMATION IN SOUTH JAKARTA

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Abstract

Location based services application for Android devices can help users to know the location of health facilities that are located in South Jakarta area quickly and efficiently. Through smartphone or Android-based mobile devices that have been connected to the Internet network, the user directly treated display a map showing the location of where users are located with a radius as a reference to show the location of the nearest health facilities of the location user. Software development model used to build applications in this research is a prototyping model. The steps taken include planning, data collection, requirement analysis, application design, implementation, and testing. Application testing has been done in two ways, namely using black box testing and user acceptance testing. The testing results of applications using black box testing performed on five Android mobile devices, and the results obtained show that the application can be run properly. Results obtained after rounding is 4.00, so it can be concluded that the user approve this application easy to use and can help in finding information about health facilities.

Keywords: Android, health, Location Based Service (LBS), prototyping.

INTRODUCTION

Badan Penyelenggara Jaminan Sosial also known as BPJS is a health insurance program specifically assigned by the government to hold health care insurance for all Indonesian people. BPJS is one of the Government's commitment that wants to realize the health care service for all people of Indonesia with affordable cost. The implementation of BPJS for public reduces the risk of expending cost to be incurred by the public when the related public has health problems due to illness or accident. BPJS provides a variety of health care facilities that used to organize personal health services, or commonly referred to health facilities. Health facilities provided by BPJS include pharmacies, clinics, health centers, and hospitals. The following data on the number of health facilities located in South Jakarta, the number of health facilities type of pharmacies is 16, type of clinics is 48, type of health centers is 79, and type of hospitals is 13.

The BPJS participants located in South Jakarta and did not know location of health facilities that provides a services BPJS as a result of the many of health facilities BPJS, it usually will have difficulty to find location of health facilities in those area. Besides they

often have difficulty in finding the nearest location of health facilities where they live. It can be fatal, if there is a crucial condition happen in which a patient participants of BPJS require rapid treatment, but they do not know location of health facilities located in their area. Based on the description above it is necessary to have an application that is capable of providing information about the location of health facilities in South Jakarta. This application must be accessible anytime and anywhere.

According to GFK report in 2014, the company source provider information and consumer markets, the growth of smartphone users in Indonesia reached 70 percent compared to the previous period. Based on these reports, it turns out Android is an operating system which dominates the smartphone distribution in the country by division market amounted to 59.91 percent. Android has been popular among smartphone users since it was introduced to the market by Google with the OHA (Open Handset Alliance) in November 2007 [1]. This is because Android provides a variety of services such as streaming and tethering, storage services, and connectivity services.

Location Based Service (LBS) is an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the ability to make use of geographical position of the mobile device [2]. A LBS services can be used in a variety of contexts, such as health, work, and personal life. LBS include services to identify the location of a person or object and utilizing this information to provide a service; such as discovering the nearest banking cash machine or the whereabouts of a friend or employee [3].

The LBS capabilities allows to create a mobile application using the Android operating system which is able to meet the needs of BPJS participants in order to find location and information related to the health facilities that provides BPJS services in South Jakarta.

This research focused on the development of applications that can help community in order to find locations and information related to health facilities providing BPJS services by utilizing the Location Based Service (LBS). Information related to health facilities include the name of the facility, the address where the facility is located, the phone number can be contacted, as well as what services are provided by health facilities. Coverage area on this application covers an area of South Jakarta. The selected health facilities include a health facilities types Pharmacies, Clinics, Health centers, and Hospitals.

This application is implemented into a smartphone with Android operating system, and uses Java as a programming language to build it. The programming language used to build Android applications is a Java and XML markup language for defining the design of the interface of Android applications, styling, themes, constants, applications permission,

icons, activities, and services. This application requires the use of Internet network (mobile network / wireless) or a GPS to detect the position of user and the device must have an internet connection.

The purpose of this research is to build an application of Location Based Service (LBS) which is implement-ed on Android operat-ing systems for map-ing the locat-ion of health facilities that provides BPJS services in South Jakarta and also provides information about what servies are available at those health facilities.

RESEARCH METHODOLOGY

SDLC Model

Software development model used to build the applications in this research is a prototype-ing model. The steps consist of planning, data collection, requirement analysis, application design, implementation, and testing. The sequence of phases of this model as shown in Figure 1.

UML

UML design is tool of modelling model-ing business process to provide a better approach in explaining the health facilityies applications. UML is used to build applicat-ions of health facilities is the use case diagram, activity diagram, and class diagram and sequence diagram.

Use Case Diagram

Use case diagrams are used to visualize the functional requirements of the application, including the interaction between actors or users and applications. Application is intended for users who are looking for health facilities that are integrated with BPJS services in South Jakarta. Users can display the main menu page of the application and then choose one of the four interaction available. Users can choose one of four categories of health facilities available, namely apotek (pharmacies), klinik (clinics), puskesmas (health centers), and rumah sakit (hospitals). Users must choose one category and complete the configuration such as choosing the radius of the location of the user is located. After that the application will load the map will be treated to a collection marker showing the location of the health facilities is located. Users can press one marker to display information related to the health facilities are searched. The information displayed is presented in the form of a dialog box. In the dialog box, the user not only can display information about the health facilities, but the user can also display information about services that exist in the health facilities and call the health facilities.
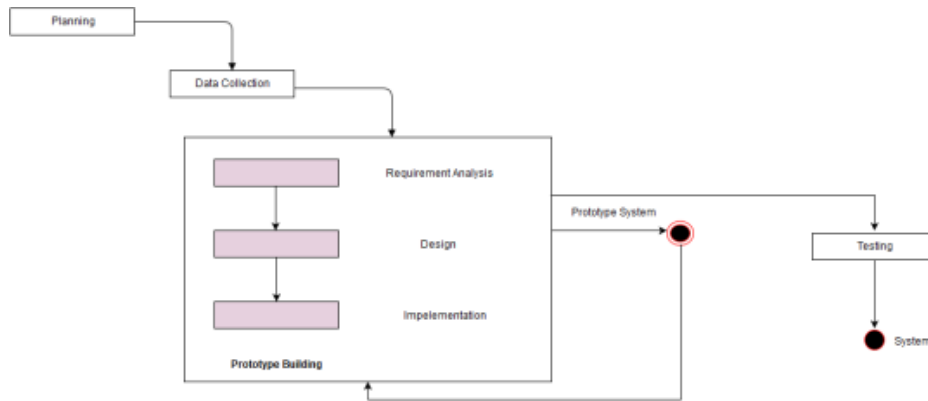
Figure 1. Prototyping Model

Activity Diagram

Figure 2 is one of many activities diagram of the application. This diagram shows the work flow of activity to display health services information.

Sequence Diagram

Figure 3 is one of many sequences diagram of the application. This diagram shows the sequence of process to display health services information.

Class Diagram

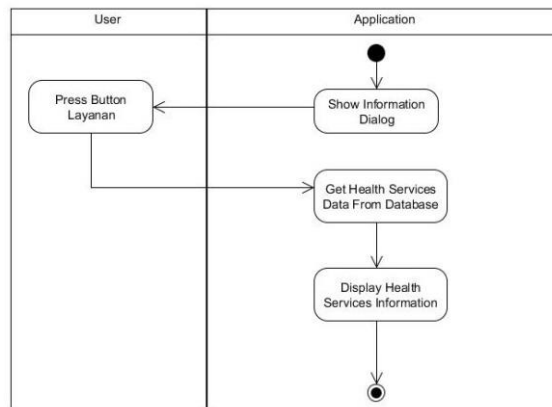Figure 4 is a class diagram for the classes involved in the Main Menu feature and its relations.

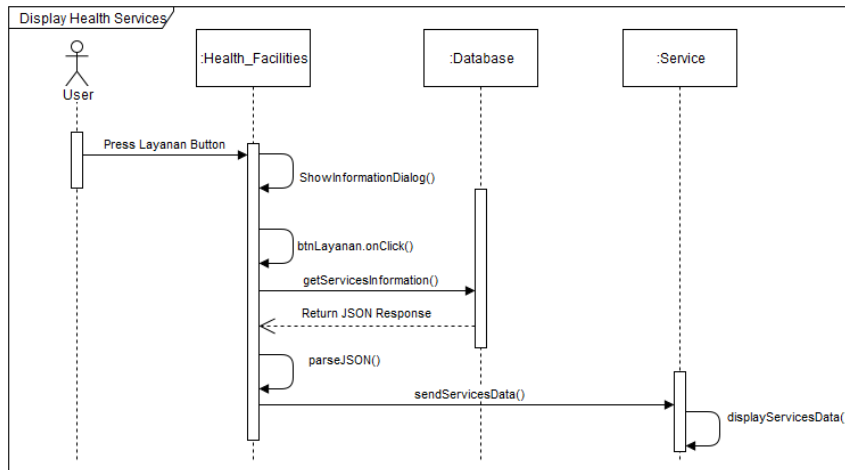Figure 2. Activity Diagram to Display Health Services Information

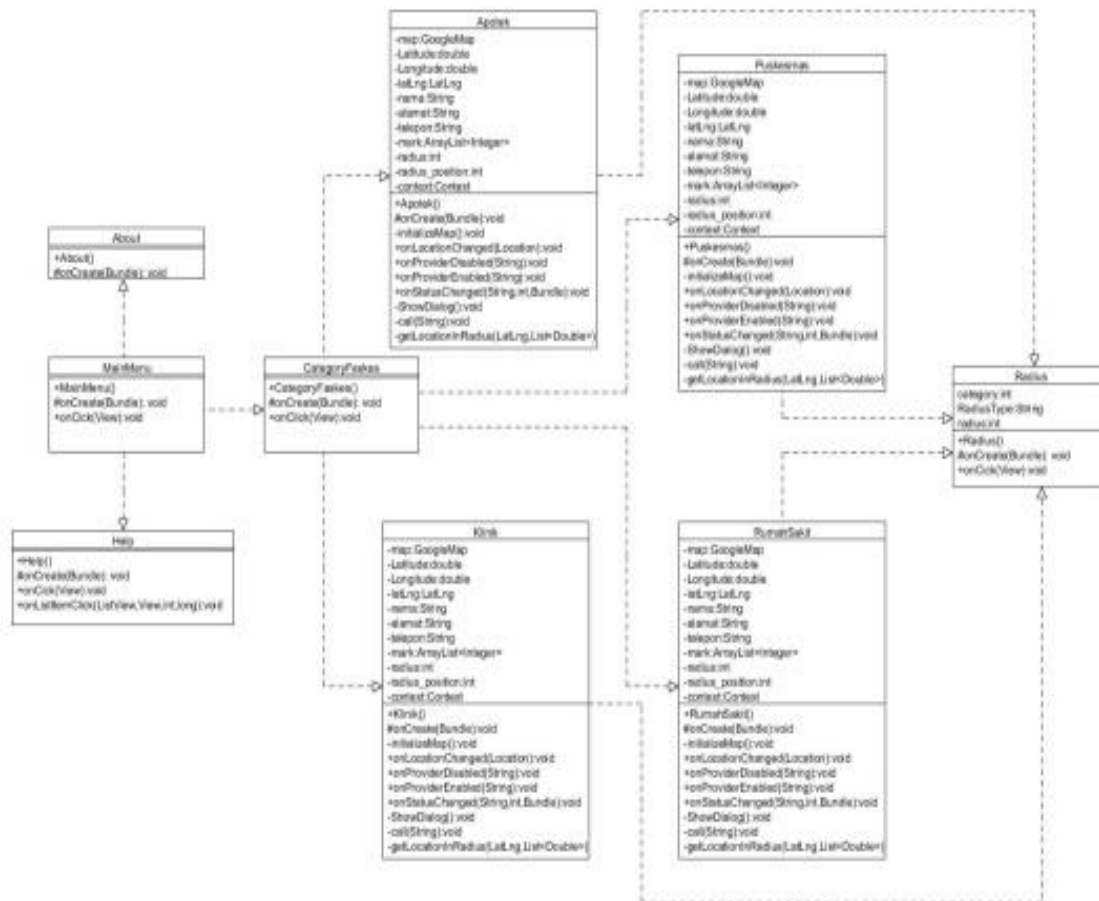Figure 3. Sequence Diagram to Display Health Services Information

Figure 4. Class Diagram

Navigation Structure

The navigation structure is used to describe the flow and the relationship between each page in the application. Navigation structure used in this application is a composite navigation structure. The navigation structure of the application can be seen in Figure 5. Two-way arrows indicates the

navigation can go to the next page or return to the previous page.

Interface Design

The interface design is one of the important thing before entering into the implementation phase, because by knowing the interface design of application, developer becomes more easily create an application user interface in accordance with the design that has been created. Figure 6 are interface that has been designed.
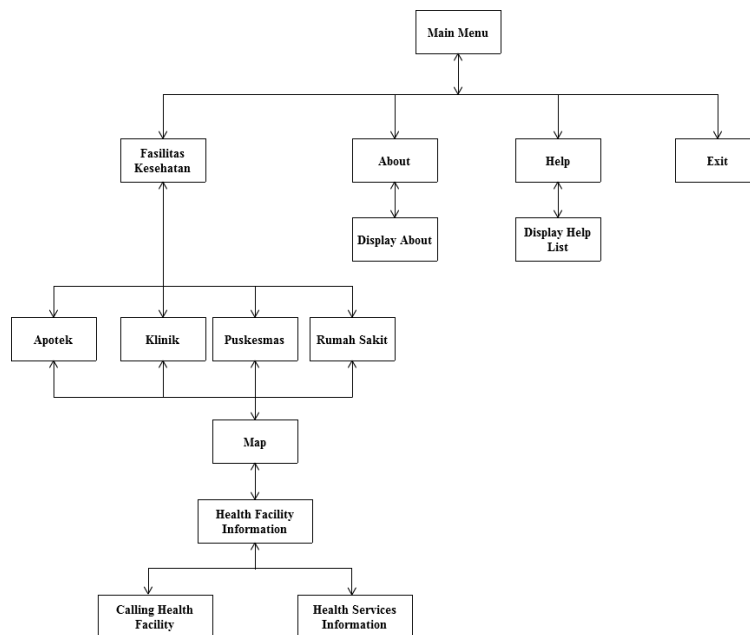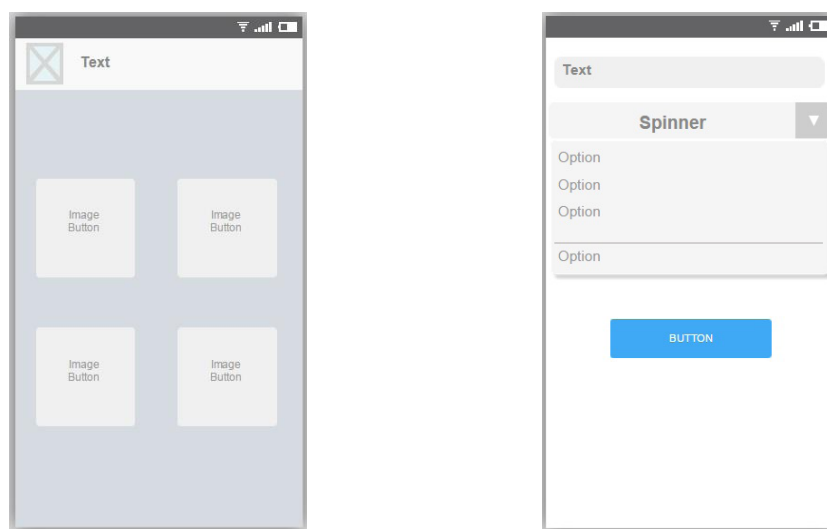

Figure 5 - Navigation Structure for Application

(a) User Main Menu   (b) Choose Radius

Figure 6. Interface Design

RESULTS AND DISCUSSION

Implementation

This stages was conducted by building an application in the form of writing the program code to the Android platform based on the analysis and design have been made in previous stages. Code was written by using the Java programming language to handle Android applications and code using PHP programming language to retrieve data from the database. The implementation results can be seen in the Figure 7.

User Acceptance Testing

To determine whether the system feasible or not to be used by users, then user acceptance test is main point of success of the new application. User acceptance test is done by giving a questionnaire applied with liked scale method to several respondents. Then the results of the questionnaire were analyzed to obtain the level of satisfaction or user acceptance of the application. By using the following equation is obtained user acceptance test results as shown in Figure 8.
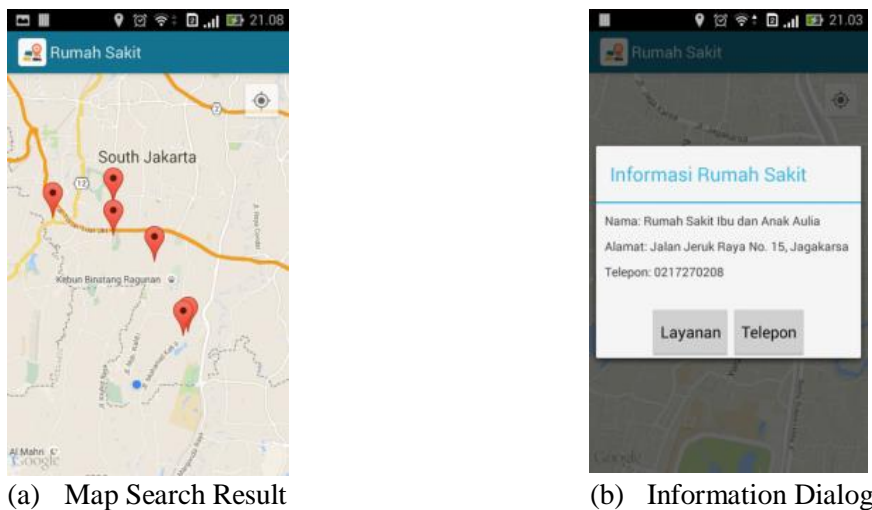
(a) Map Search Result	(b) Information Dialog

Figure 7. Implementation Result

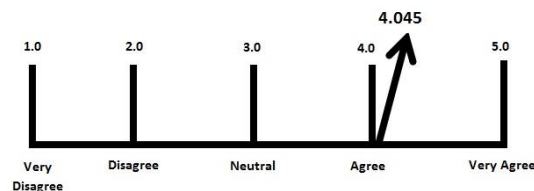Figure 8 – User Acceptance Test Result

$$result = \frac{\sum Scoring\ Mean}{\sum Respondent}$$

The application is able to determine the health facilities within a radius of 500 meters to 10 kilometers. The category of health facilities are available in this application includes pharmacies, clinics, health centers, and hospitals. The application provides information related to health facilityies include the name of the facility, the address where the facility is located, contact phone number. It can also provide information regarding what services are provided by the health facilities and the user can call one health facilities if they need any other information that is not provided by the application.

CONCLUSION AND SUGGESTION

Based on the application development process, it can be concluded that the software tools such as Java, XML, PHP, Mysql, JSON, and Google Maps API can be used to implement the results of the analysis and design in the form of an application program.

Future work

This health facilities application still needs to be improved and developed, therefore the suggestions for further development of this research are as follows: (1) Providing a feature to choose the health facilities by a certain health services. For example a user wants to search for health facilities that provides radiology services, then the application will only show the health facilities that provides radiology services. (2) Adding the direction guide feature from the user's location to destination location. This feature is expected to be able of easing the user, when users search for the certain locations. (3) Adding a health facilities data that is in the whole area of Jakarta, so that applications are not only used by users who are in South Jakarta but also by users across Jakarta.

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