Navigation Of Health Services Location On The Android-Based Using Location-Based

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Navigation Of Health Services Location On The Android-Based Using Location-Based Services

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ABSTRACT

Location-Based Services (LBS) is a concept where its context is modeled on location. Location-Based Services can be accessed on the mobile device through cellular network ability and by using geographical position of mobile devices. By using latitude and longitude from Global Positioning System (GPS), the user can get information a location in accordance with GPS. This research will develop navigation applications for the community that requires guide in the routes towards and locations of health services in city of Semarang. It is based on the literature review that the community does not know all of the locations of the health services because such information is insufficient. The application developed is preceded by a phase of conducting analysis for user requirements including analysis of the ongoing system, analysis of the findings of interview as well as identification of information necessity and system requirements. The designing phase is focused on the Graphical User Interface design of mobile device and Web Admin design. Our design method uses case diagram, Activity diagram, Sequence diagram, and Class diagram. The research has resulted in an application which can give the facility knowledge of the layout and geographic positions nearest to the health service located around the users with supporting information through mobile based Android. This application is based on mobile application and web services with programming language Java, PHP, XML and use MySQL.

Keywords: location-based services, android, navigation, health services, semarang

1. INTRODUCTION

Mobile technology is growing rapidly, becoming more affordable and is now a basic part of our lives. The growing demand for mobile devices is a positive sign that these devices play an essential role in our lives. Mobile devices are being used as a means of information exchange, chat, entertainment, SMS, and other social communication.

Android is the world's most popular operating system (OS) for mobile devices and tablets. It is an open source OS, created by Google, and available to all kinds of developers with various expertise levels. Android is the first free, open source, and fully customizable mobile platform, a software stack for mobile devices including an OS, middleware and key mobile applications. The Android SDK provides the tools and APIs necessary to develop applications on the Android platform [9].

The location health services in Semarang are often sought out and visited domiciled in and outside the city of Semarang. The wide area and the many health services in Semarang has made many visitors find it difficult for directions toward the location health services although information on the facilities has been available in print media such as: leaflets, brochures, banners, newspapers, and electronic media such as television and website. But these means were still not helping visitors, and moreover, have not yet availed information in the form of applications on navigation location health services in Semarang that can be accessed through an android mobile. With android mobile technology, users can potentially access health services locations they need anywhere and anytime, on hospitals, polyclinics, pharmacies, and others: the shortest routes, the streets that can be passed, and phone services.

Localization, also known as positioning, is a process of determining the spatial position of an object or a person. There is an application for localization such as Location-Based Services (LBSs). Recently, LBSs is a popular area of research nowadays because of its wide spread applications in daily life [10]. LBS is mobile application which depends on mobile devices and
mobile network to calculate the actual geographical
location of mobile user, further to provide the service information related with the position the users need by using Google map with accessed internet connection. [17]

Based on this background, the improvement of access to health services can be elucidated as follows :
how can we design the navigation application of health services locations in Semarang using Android smart phones while utilizing LBSs methods and Google map to provide location information, its geographical position with its database connected to the web server?

1.1. Objectives.

The objectives of this paper and the desired advantages to be developed shall be as follows:
1) Identify and analyse location data by latitude longitude health services for database design, input-output interface, and health services information.

2) Create an application prototype based on mobile android to present information on-line via the mobile phone equipment. This, in turn, can deliver real results and can be used by community to ease navigation and to determine location of the health services. Ultimately it will improve the handling of health care for the community.

1.2. Advantages.

The advantages of this paper shall be as follows:
1) Establishment of the database of latitude longitude location of health services that include spatial data of the Semarang city and non-spatial data.
2) Establishment of an android-based navigation application with distributed data management and which the community can access at any time and at any location with mobile equipment.
3) Facilitate the community in finding the location of Semarang city health services using Google map with the route to the intended location.

2. LITERATURE REVIEW

In this section, we present some of the related works done in the field of LBSs application of navigation. In daily life it is often found that a person experience problems in finding a location of health services whose locations are in areas that have not been visited, therefore we need a navigation application site health services [1] which can help in finding the location and can provide information about the route to the locations searched. [8]-[5]-[14]-[12].

In literature about the application of location search for navigation location, many studies have been conducted on the localization of mobile applications that can guide and provide information about a tourist spot that can be accessed anytime and anywhere [7]-[4]-[3].

Sighal, 2012 [16] introduced the A-GPS (Assisted-Global Positioning System) in mobile and through Web Services using GPRS (General Packet Radio Service), LBSs can be implemented on mobile Android to provide these value added services : advising clients of current traffic conditions, providing routing information, helping people find nearby objects such as restaurants, hotels, hospitals.

Kentris,et.al (2011) [6] in his research titled "Mytilene E-guide: a multiplatform mobile application tourist guide exemplar" discusses multiplatform mobile applications for tourists that can be accessed online or offline.

Shu (2010) [13] in his research titled "City Guide over Android" discusses mobile city guide using the Android platform and describes the prototype of a city guide.

Sariyun, et.al (2014) [11] discusses in his research on producing applications that can provide information about the location of the nearest Posyandu (integrated service post (health)) in the form of a map by using Google map via mobile Android.

Previous literature reviews are in contrast to these article's related works, because this paper aims to analyze and design complete database applications of health service locations in Semarang stored on web servers. We strongly hybrid in terms of utilizing the GPS, LBS, Haversine formula and Google map on android-based.

3. METHODOLOGY

3.1. Stages of Development.

This study used Action Research, and the development model of the System Development Life Cycle (SDLC). This model was chosen because it can identify and determine in detail the need for an application to be built correctly.
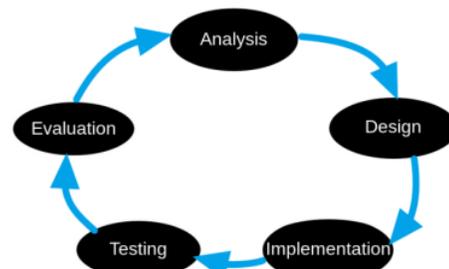

Figure 1. Phases in SDLC

Each phase is described as follows:
1) Stage 1: Application Analysis.

This phase of application analysis aimed to identify the various needs of application that is built. We performed three activities as follows :
• User needs analysis,
• Analysis of application architecture and

- User identification applications.

At this stage of needs analysis, activities gathered initial information about the existence of the systems with survey methods, direct observation in the field, and interviews with respondents and conduct literature. Focus group discussions were also conducted.

In the analysis of application architecture, we conducted analysis of user interaction with the application as realized in the form of a Graphical User Interface (GUI) on a mobile device. In this interaction, users are on a client-server application, meaning that the database is stored on the web server, and users access the data contained in the web server.

In the User Identification phase, one will determine user activity within the application as described in the application.

2) Stage 2: Design Phase.

The design phase of the application aimed to model applications the design activities, namely: [15]

- Create Class diagrams with attributes,
- Create Activity diagrams,
- Design Sequence diagram,
- Design Class diagram,
- Arrange the tables in a database,
- Compose the menu structure,
- Design the graphical user interface.

3) Stage 3: Implementation Phase.

The implementation phase is aimed at establishing the appropriate application software from the design stage. At this stage, there are two stages, namely:

- Make the user interface coding,
- Test user interface.

4) Stage 4: Operation.

In this stage the application is built and ready to be used by the user to perform the installation of software on the user's mobile.

3.2. Location-Based Services (LBS).

Broadly, LBS can be defined as network-based services that integrate a mobile device's location or position with other information in order to provide added value to the user [18]-[19].

A LBS is a service based on the geographical position of a mobile handheld device [20]. LBS can perform two-way communicate on and interaction. LBS can be described as a service that is at the confluence of three technologies namely: Geographic Information System (GIS), Internet Service, and Mobile Devices as to which figure 2 :
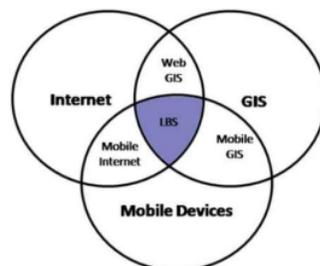

Figure 2 : LBS Technology

In order to make LBS services possible, some infrastructure elements are necessary, namely [21] :

- mobile devices,
- applications,
- communication network,
- positioning component, and
- service servers

4. DESIGNS AND IMPLEMENTATION

4.1. Needs Analysis

A person traveling to a location of health services in the city of Semarang may be unfamiliar with the location. To ease this problem, he may perform the development of a navigation application location of health services in the city of Semarang with descriptions and map locations through Google Maps APIs, using GPS and LBS. The application can determine the location of a health services and navigate the user's current position with the locations of health services to be addressed.

In the development of applications, devices required at the design stage consists of a laptop with a processor core i3 and mobile based on Android and software the Android SDK, Android Development Tools, Java, XML, PHP and MySQL.

4.2. Capabilities of Application

The capabilities of the application are as follows:
- Able to perform a search of health services,
- Inform the travel time and distance from the origin to the intended location.
- Display information is needed for health services such as names and locations of hospitals, health centers, pharmacies, clinics, medical laboratories, doctors, midwives, and health care with alternative medicine, etc.

4.3. Application Architecture

Physical architecture application refers to a three-tier model. Physical architecture of the application consists of three main components, namely client (Frontend), application servers (Web Admin and Web Service), and database servers. The application architecture is shown in Figure 2.
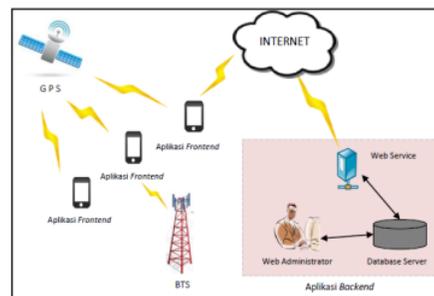

Figure 3. Application Architecture [11]

4.4. Software Features

This application feature software functions in accordance with the authority of the admin and the end user. Administrative authorities can manage content databases as a whole. End user authority can obtain information about the location of the premises of health services, to be able to search a location of health services, accompanied with a description, the time and mileage.

4.5. Implement Application.

To run on android mobile, this application needs to be installed first. Here are the stages to run:
- Copy the file this application in .apk form in my file folder on android mobile.
- Open the .apk file and will be installed automatically
- Once installed, the user can open the application via its icon. The initial view splash screen will appear

4.6. Web Hosting

The following is configuration guidance on hosting server that has to be done in order for the application to be running well. The configuration process shall be as follows:
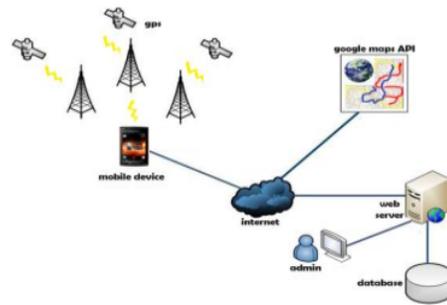
Figure **4**. Web Admin Configuration

- In order the application to be run, the database needs to be placed on a web server.
- To connect database to application required PHP scripts, so that the data contained in the database can be read
- Generate Google API key so that applications can connect with Google map.

5.   EXPERIMENTS AND RESULTS

5.1. The User Interface

The user interface describes the interaction between the user and the applications in the form of Graphical User Interface on mobile.

Display page of Splash Screen.

The first time the application was run, splash screen page is displayed as the opening page of the application. This view displays the logo Semarang City Health Service along with the application title.

Figure 5. Splash Screen

Display page of Main Menu.

The next page displays the main menu. In this view there are six buttons as follows: button for the user's location, health services search button, button for city of Semarang, health services button to display the category of health services, the about application button , and the help application button.

Figure **6**. Main Menu

Display page of Semarang City.

If the user selects the button of Semarang city, it will be display the Semarang city map with the location markers of any health services.
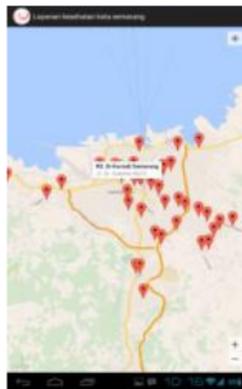

Figure 7. Marker of Health Services

Display page of Type of Health Services.

If the user presses the Health Services submenu, it will be display different types of categories of health services:

Figure 8. List Type Health Services

Display page of Detail Health Services

Display subcategory of health services, for example, sub categories hospitals.

Figure 9. Details Sub Category List

Display page of My Position

Return to the main menu page. If the user presses the My Location button, it will display a map that will show the current user position. Blue marker is the position of the current user. In this view the user can see the position based on the value of latitude longitude by using the Geolocation API.

Gambar 10. Display Page Of My Location

Display page of Searching.

Sub Menu search is used to search for health services that will be addressed. In this view there is a form and a search button that can be used to search for health by writing the key word in the search form.

Figure 11. Display Menu Search

Display Page of Navigation.

Route Map page shows the purpose of the current user position to the point location of a previously selected health services. This navigator page can be accessed if the user presses the "Get Direction" page containing details of health services. The route shown is the shortest route. This is performed utilizing Haversine formula.
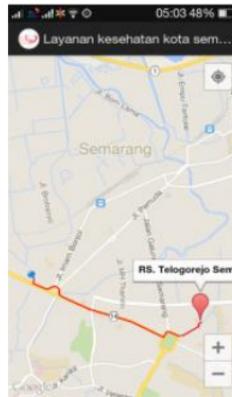
Figure 12. Navigator

6. CONCLUSIONS AND FUTURE WORK.

Through the navigation of Health Service application, the public will be more equipped to easily and precisely in finding the location of health services that are spread across the city of Semarang. The application is expected to provide information on the spread of the location of health services in every area of the city of Semarang. Hence, it hopes to be useful and to provide convenience for people interested in finding the location of health services.

Future work will focus on adding a folder representing a model for map off line, on connecting to social media and on augmenting reality features.

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