

Gis Applications Using Location Based Service (LBS) Methods Based On Android. (A Case Study In Bandar Lampung)

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Abstract. Bandar Lampung city is one of the cities in Lampung Province and is the capital city of Lampung Province. In Bandar Lampung city, there are still locations such as tourist objects, hospitals, hotels / inns, education (high schools/ vocational schools / university), restaurants, and malls / traditional markets that have not been explored so that many local and non-local tourists do not know the location. Thus, the author designed an android-based application that is the profile of Bandar Lampung city (Probal) which aims to help or facilitate the people of Bandar Lampung city and tourists who come from various regions to simplify finding the locations in of Bandar Lampung city by using location based service (LBS) method. **Keywords.** Bandar Lampung city, Location Based Service, Android.

1. Introduction

Lampung is a province located on the southern tip of the island of Sumatra Indonesia, its capital is located in Bandar Lampung in the north bordering Bengkulu and South Sumatra and has an area of 35,587 km². Lampung Province has 13 regencies and 2 cities, one of which is Bandar Lampung City.

1.1 Background

The development of information technology is now rapidly entering various fields; so many new technologies are emerging especially in the world of IT. One of them is geographic information system technology, geographic information system (GIS) which functions to enter, store, recall, process, analyze and produce geo-referenced data or geospatial data.

Bandar Lampung City is a city that has a diversity of culture and nature, the city of Bandar Lampung is a city in Indonesia as well as the capital and largest city in Lampung Province. Bandar Lampung is the third most populous city on the island of Sumatra after Medan and Palembang by population. Geographically, the city of Bandar Lampung is the main gateway of the island of Sumatra in the flow of land transportation.

There are many locations in Bandar Lampung city which have not been published or explored so that many domestic tourists do not know them yet. The location based service (LBS) method that serves to provide location information based on the nearest user (user) helps in searching the location based on 6 parameters such as education, university, hospital, hotel, restaurant, traditional market to facilitate them finding the users' desired locations.

1.2 Problem Identification

The problem identifications are as follows :

1. The absence of a profile application of Bandar Lampung city that can allow users to determine the location around the user based on 6 parameters.
2. Lack of information media of users' nearest location in Bandar Lampung based on existing parameters.

1.3 Problem Formulation

Problem formulation in this research is :

"GIS Application Using Location Based Service (LBS) Based on Android".

1.4 Problem Limitation

The following problem limits :

1. This application is intended to find location positioning information in Bandar Lampung city based on the nearest user (user) based on 6 parameters.
2. This app uses GPS as location positioning and Open Street Maps (OSM) as digital map.
3. GIS applications can only run on platforms and platforms with internet network connections.

1.5 Research Objectives

The research objectives are as follows :

1. Facilitating the direction of local roadmap to explore the locations of Bandar Lampung city associated with some parameters that exist based on the nearest user.
2. Creating a system location positioning of users on the profile of Bandar Lampung City based on Android by using Location Based Service (LBS) method.

2. Basic Theory

2.1 Definition of Application

Application is a software unit that deliberately created to meet the needs of various activities or occupations, such as commercial activities, advertising, community services, games and various other activities undertaken by humans. (Hengky W. Pramana, 2006).

2.2 Definition of Android

Android is a linux-based mobile device operating system that includes operating systems, middleware and applications, along with more than 34 major companies in the world unite to form an alliance called OHA (Open Handset Alliance) that is useful for improving the new operating system. (Safaat.2012: 513).

2.3. Location Based Service Definition (LBS)

Location based services are information services that are accessed using mobile devices over the internet and cellular networks and utilize locations capabilities on mobile devices (virrantasu, et al., 2001).

a. Location Based Service component (LBS) :

The use of location-based services also requires several components; some of the elements used are as follows :

1. Mobile Device is a tool used by the user to request the required information. The device allows the device that has navigation facilities such as PDA, mobile phone, laptop and others.
2. Communication Network is a cellular network that sends user data and service requests.
3. Positioning Component usually the user's position must be specified for service processing. User positions can be obtained using a communication network or by using a Global Positioning System (GPS).
4. Service and Content Provider is a service provider of data information that can be requested by the user. The LBS component can be shown in the following figure:



Figure 1. LBS Component

b. Main Elements of Location Based Service (LBS) :

Location Based Service (LBS) has the main elements :

1. Location (API Map) provides device for source for location based service (LBS), Application Programming Interface (API) map provides facility to display and manipulate map.
2. Location Provider (API Location) provides location search technology used by the device. Location API relates to GPS (Global Positioning System) and real-time location data. API Location with android data is internet packet data used by the device.

2.4 Definition of Android Studio

Android Studio is an IDE for Android Development that Google introduced in the Google I / O 2013 event. Android Studio is a development of Eclipse IDE, and is based on the popular Java IDE, IntelliJ IDEA. Android Studio is the official IDE for Android app development. As a development of Eclipse, Android Studio has many new features compared to Eclipse IDE.

2.5 Definition of Open Street Maps (OSM)

Open Street Map (OSM) is a free project that collects special data and can be used freely (Open Data). The data is used to build world maps and special maps that are derived and utilized for a variety of needs including navigation. Open street map (OSM) allows anyone to view, edit and use collaborative built-in geographic data from where and by anyone on the surface of the earth.

2.6 Definition of Global Positioning System (GPS)

The Global Positioning System (GPS) is a collection of satellites and control systems that enable a GPS receiver to get its location on the earth's surface 24 hours a day. This system uses a number of satellites in orbit of the earth, which emits signals to the earth and is captured by a receiving device. Global Positioning System (GPS) is a system for determining position on earth surface with the help of synchronized satellite signal. This system uses at least 4 satellites that transmit microwaves to the earth. This signal is received by the receiver on the surface and in use to determine position, speed, direction and time. (Gintoro, I, & Hali.2010).

2.7 Definition of Geographic Information System (GIS)

Geographic information system (GIS) is an information system used to enter, store, recall, process, analyze and produce geo-referenced data or geospatial data, to support decision making in planning and processing of land use, natural resources, environment, transportation, city facilities, and other public services (Murai, 1999).

3. Research Methodology

3.1 Needs Analysis

3.1.1 Software Requirement

The software used to support the program to be designed to run well is as follows :

Table 1. Software Specification Requirements

| No | Client | Software |
|----|--------------------------|-------------------------|
| 1 | Operation system | Windows 8 |
| 2 | Database | MySQL, XAMPP |
| 3 | Software Development | Android Studio |
| 4 | Data packet | Ooredoo (Indosat) |
| 5 | OS (<i>Smartphone</i>) | Version 4.1 (jellybean) |

3.1.2 Hardware Requirement

The hardware used to support running the designed application must have the following specifications:

a. Computer

- Processor : Intel Pentium Dual-Core
- RAM : 4 GB
- Memory : 1 GB
- Monitor : Resolution 1366 x 768

b. Smartphone

- Processor : Dual-Core 1.2 GHz
- RAM : 1 GB
- Memory : 4 GB
- Monitor : 4.0" (480 x 800 pixels)

3.2. Location Based Service (LBS) Concept

In the study of the profile of Bandar Lampung city uses 4 methods of approaches which are Location Based Service (LBS), Greedy Algorithm, Crowd sourcing and Gamification. However, in this study the authors conducted research using Location Based Service method (LBS). The concept of Location Based Service method itself uses a geographic information database that is combined with Global Positioning System (GPS) technology embedded in users' smartphone to track a movement of user devices and sends the information required by the user device.

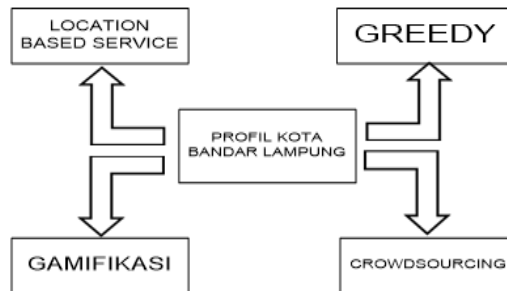


Figure 2. Profile Scheme of Bandar Lampung City

4. Results and Discussion

4.1 Image of Application Display

Here is a capture view of GIS applications from the initial view to the lookup location that is in the application :

4.1.1 Image of First Display (Splash)

The following image represents the initial appearance of GIS applications.



Figure 3. Main View Display (Splash)

b. Image of Login Display

Display login is a view that works for users to enter the application by entering the username and password after registering for the new user.

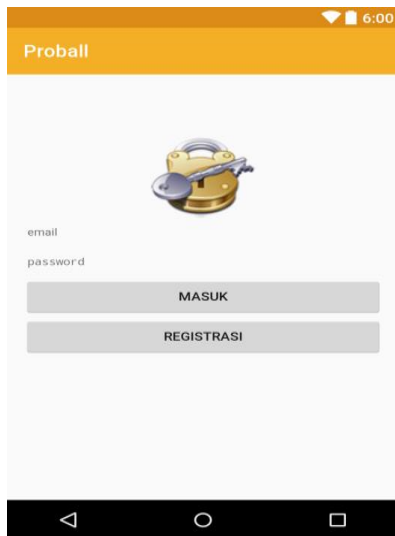


Figure 4. Login Display Image

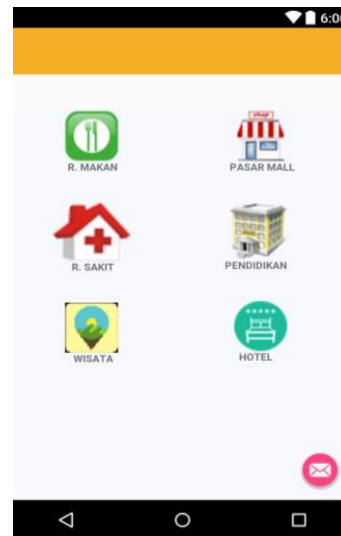


Figure 5. Main menu Display

c. Image of Main Menu Display

Main Menu Display is a view that contains 6 parameters that exist in GIS applications.

d. Image of Location Searching Display

This view is a view that serves to find the location based on the nearest user with the existing parameters.

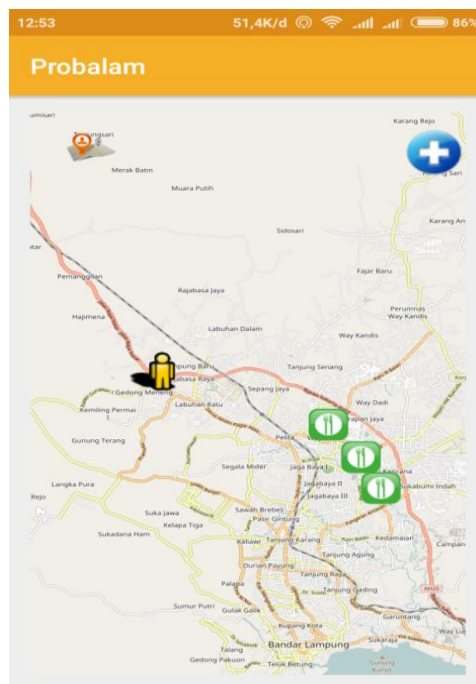


Figure 6. Location Searching Display

4.2 Application of Location Based Service (LBS) to GIS Application

Here are the steps to apply Location Based Service (LBS) method to GIS application :

1. Install First application of Bandar Lampung city profile on Smartphone and make sure that Smartphone has android operating system, and then open the application already installed.

2. Application of Bandar Lampung city profile will automatically connect with internet provider connection available on the users' android Smartphone used to run the profile application of Bandar Lampung City like for example: indosat and telkomsel.
3. The network will send a satellites request via GPS embedded in the android Smartphone to know the existence of the user through the user's point of coordinates Latitude and Longitude.
4. Provider will connect the application of Bandar Lampung city profile with probalam.com server to request data required by the users.
5. Then the users will get the required data and will be displayed in the application of the profile of Bandar Lampung city that is already on the user's android Smartphone.

5. Conclusion and Recommendation

5.1. Conclusions

Based on the results and discussion, the conclusions of this study are as follows :

1. Based on the results and discussion that the application of location based service (LBS) on GIS application can help facilitate the outsider and community of Bandar Lampung city to determine the existing location in Bandar Lampung city based on available parameter data.
2. This research produced GIS application that can help and facilitate the community in finding the location in Bandar Lampung city based on the nearest user.

5.2. Recommendations

As a form of perfection of application system of Bandar Lampung city profile of this research, the authors convey some suggestion that is :

1. GIS application in this design is an application that is not entirely perfect thus it needs a developed to develop GIS applications to be better and can be nearly perfect.
2. In this study the authors only provide location information based on 6 parameters of tourism objects, hospitals, education (high schools/ vocational schools / university), hotels, restaurants, malls/traditional markets so the author expects for developers to provide more location information so that the community can access more easily in searching of existing locations in Bandar Lampung City.

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