Smart Application Development Recommendations for Mobile Food Traders Using Push Notification and Location Based Service (LBS) Based on Android

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ABSTRACT

Mobile traders, especially in the city of Bandung, are currently experiencing difficulties in obtaining permanent buyers and customers. Evidently, 26 out of 30 traders interviewed felt that their income was increasingly decreasing due to the many buyers using online applications. Mr. Dedi is 39 years old, one of the wet lumpia traders said that he found it difficult to get buyers and it was difficult to determine the direction of his destination when trading around. Likewise, buyers who want to buy mobile merchandise find it difficult because they do not know the schedule of the traveling merchants and are not aware of the traders themselves. In this case, the traveling food traders and buyers really need an application container that can facilitate the transaction process. Based on the results of alpha and beta tests that have been carried out at the implementation and testing stages, it can be concluded that the development of smart applications recommended by mobile food traders using push notification and location-based service (LBS) based on Android can make it easier for mobile traders to get buyers, and buyers are facilitated in knowing the position of the nearest traveling merchant.

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Keywords: Recommendations, Android, Google Maps API, OpenWeatherMap API, and GPS

1. INTRODUCTION

1.1 Background

Current technological developments are increasingly rapid, especially advances in information technology, especially in mobile and internet technology. The use of mobile and web applications is said to be more effective and efficient because of the ease of accessing and delivering information. In this day and age, there are still many traders who often trade around. Traveling merchants are traders who sell merchandise by offering merchandise from one place to another.

Mobile traders, especially in the city of Bandung, are currently experiencing difficulties in obtaining permanent buyers and customers. Evidently, 26 out of 30 traders interviewed felt that their income was increasingly decreasing due to the many buyers using online applications. Mr. Dedi is 39 years old, one of the wet lumpia traders said that he found it difficult to get buyers and it was difficult to determine the direction of his destination when trading around. Likewise, buyers who want to buy mobile merchandise find it difficult because they do not know the schedule of the traveling merchants and are not aware of the traders themselves.

From the research written by Sihabudin Ahmad [1], the application made was to get data information in the form of discount promotions, new product items, and events held, and to search the location of stores, especially for customers who are outside the city that are currently visiting the city of Bandung. In building this application using Google Cloud Messaging to run a Push Notification, Location Based Service to determine the location of the API Maps and API Location, Google Direction API to calculate directions between locations, Web Service as self-containing and JSON as a lightweight data exchange format. Alpha testing using the Black Box method and beta testing using questionnaires.

From other studies written by Mohd. Siddik and Akmal Nasution [2]. Based on the final results obtained from the design of this Android-based application, it can be concluded that being able to provide an individual picture of the use of technology and Push Notification technology can contribute to the service of providing information in real time to users.

Often traders on a trade somewhere find bad weather or even rain. Climate and weather patterns in Indonesia that are irregular and extreme will interfere [3]. Of course, it will cause losses to the merchant, what else are traders going around far away. Therefore using OpenWeatherMap API technology provides weather forecasts before carrying out trading. Information obtained from OpenWeatherMap is data about weather, location, icons, description of the weather, humidity, wind speed, wind direction, wind pressure, temperature, air, and clouds stored in JSON format [4].

According to a study written by Risa and Eko [5]. Applications made can display whether or

temperature info using OpenWeatherMaps API where data is processed by OpenWeatherMap by providing accurate weather forecast data and online weather maps, such as clouds or rainfall. Beyond that, services are focused on social aspects by involving weather station owners in connecting services and thereby increasing the accuracy of weather data. This ideology is inspired by OpenStreetMap and Wikipedia which makes information free and available to everyone. OpenWeatherMap uses OpenStreetMap to display weather maps.

From other studies written by Jefferson Setiawan et al. [6] concluded, applications that are built can help users to get objective information and real time. The application can also take into account feedback from activities to display.

At present everyone uses various types of smartphones, especially Android. This is in accordance with the ability, motivation, desires, and needs of the community towards the usefulness of the media [7]. From the results of the questionnaire given to 70 respondents, 100% were obtained by smartphone users and 91.4% used an Android smartphone.

Based on the background described above the Push Notification method is very helpful in providing objective and real-time information. In this case, the traveling food traders and buyers really need an application container that can facilitate the transaction process. So by using technology, a study will be made with the title "Development of Smart Applications Recommendations for Mobile Food Traders Using Android-Based Push Notification and Location Based Service". In the hope of being able to help and facilitate traveling food traders and buyers in the city of Bandung.

1.2 Purpose and Objectives

The purpose of this research is to build a mobile application to help mobile food traders and buyers in transactions in the city of Bandung by providing travel recommendations based on weather, fees and complete information about traders.

While the objectives to be achieved in the development of this application are:

1. Makes it easy for peddlers to get buyers or customers.
2. Provide recommendations for places and directions for traders and buyers based on the weather.
3. Provide complete information about merchants and provide several features such as chat, menu list, and radius to facilitate transactions of traders and buyers.

2. RESEARCH CONTENT

2.1 Theoretical basis

The theoretical foundation explains several theories and principles relating to the application or media principle to be built. The cornerstone of the principal principle is used include Understanding Applications, Android, GPS, LBS, Google Maps, Open Weather Map, Facebook, Understanding Java, UML, Web Service, MySQL, and PHP.

2.1.1 Push Notification

Push Notification is a network communication, that is, the server will send a notification message to the client if there is a change in data, so the client does not need to request data for each period to retrieve notification data. In the Android operating system, the Push Notification process can utilize Google Cloud Messaging (GCM) services to send messages or notifications provided by Google [8].

2.1.2 Recommendation

The recommendation is a suggestion that allows, justifies, or strengthens one thing or someone. Recommendations are very important to form positive, some others say one thing or someone is right and worthy. Suppose someone can use a webshop service. everyone can see testimonials from those who have transacted before, whether some people raise or not. If there are many positive testimonies, it will increase people's confidence in making transactions.

2.1.3 Information

Information is information that is processed into a type of meaning for the recipient and is useful in making choices now or in the future. data is facts or additional information that has been used in such a way or has gone through the process of reworking information so that data is deformed into data [9].

2.1.5 GPS

The Global Positioning System or commonly abbreviated as GPS is an electronic navigation tool that receives info from four - twelve satellites so that GPS will calculate positions wherever we have a tendency to unite units on Earth. GPS satellites do not transmit our position info, which is transmitted by a satellite is the position of the satellite and therefore the distance of our GPS receiver from the satellite [10].

2.1.6 Location Based Service

Location Based Service is an information service that can be accessed using mobile devices, which is equipped with the ability to find out the location of the device user and the ability to provide information about available services based on their location at that time. According to Schiller J, Location Based Service can be defined as "a service that integrates the location of a mobile device or position with other information so that it can provide added value to the user" [11].

2.1.7 API (Application Programming Interface)

An API is an interface that accesses the application or service of a program. The API allows developers to use functions that exist in different applications so that developers do not have to recreate them from scratch.

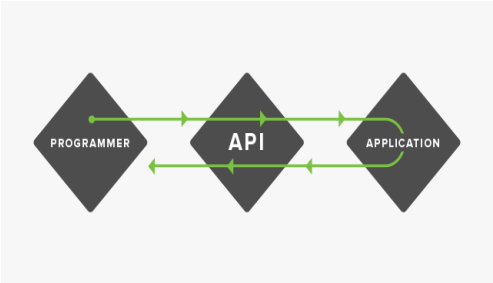

Image 1. API

2.1.8 Google Maps Android API

Google Maps Android API is a service for displaying maps in the android application. Developers can add maps to applications based on data in the Google Maps API to automatically handle access to Google Maps servers, download data, display maps, and respond to map movements.

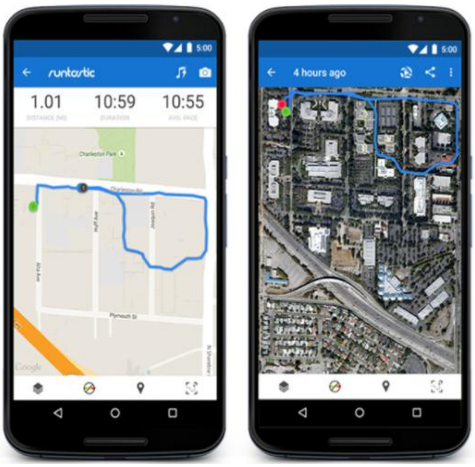

Image Source :
https://developers.google.com/maps/?hl=id
Image 2. GPS on android

2.1.9 OpenWeathermap API

OpenWeatherMap is an online service that provides the latest weather data, including forecast data and the latest historical data for web service developers and mobile applications. For data sources, OpenWeatherMap uses meteorological broadcast services, raw data from airport weather stations, raw data from radar stations, and raw data from other official weather stations.

Here is an example of weather data in Openweathermap can be seen in Image 3 below :

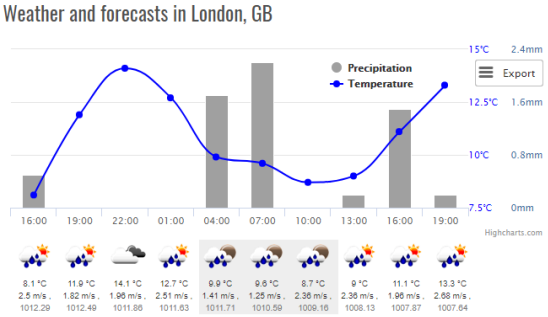

Image Source: https://openweathermap.org/
Image 3. Examples of weather data in Openweathermap

2.2 Research Methodology

The method used is a descriptive method. Descriptive method is a method in examining the status of a group of humans, an object, a set of conditions, a system of thought or a class of events in the present.

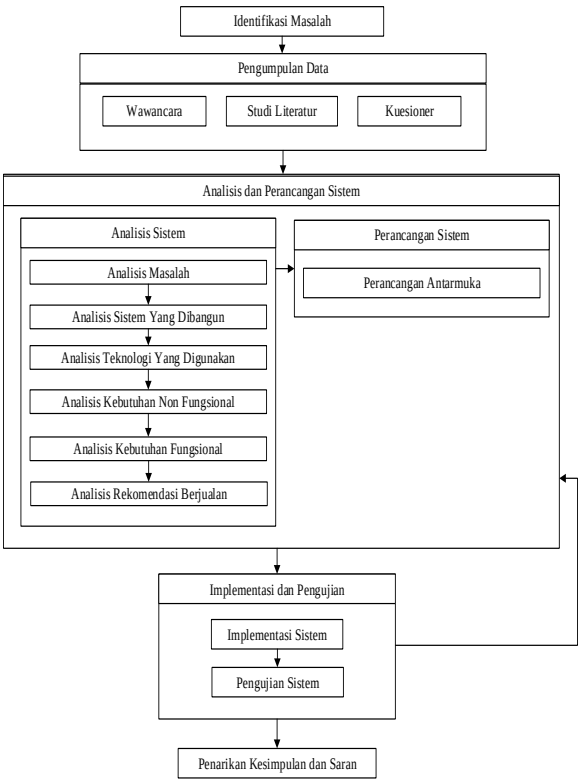

Image 4. Research methodology

2.3 Use Case Diagram

Use Case Diagrams are used to describe the interaction between actors and the activities contained in the system built. By describing the Use Case Diagram, the functional-functions contained in the system can be seen briefly.

The Use Case Diagram on the mobile system that is built can be seen in Image 5 below:

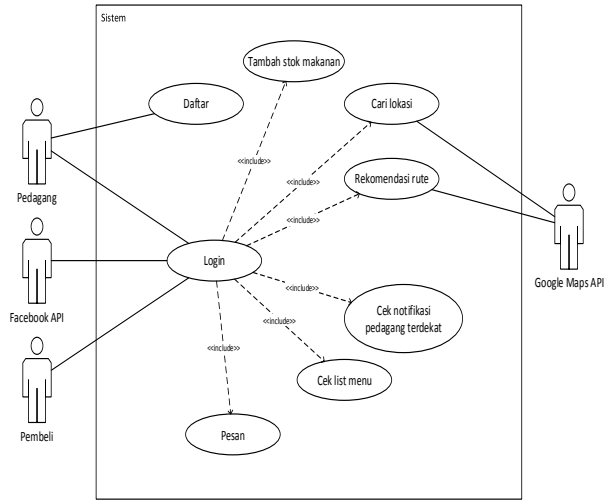

Image 5. Use Case Diagram

2.4 Relationship Scheme

In designing the relation scheme each table must have a relationship with the other table.

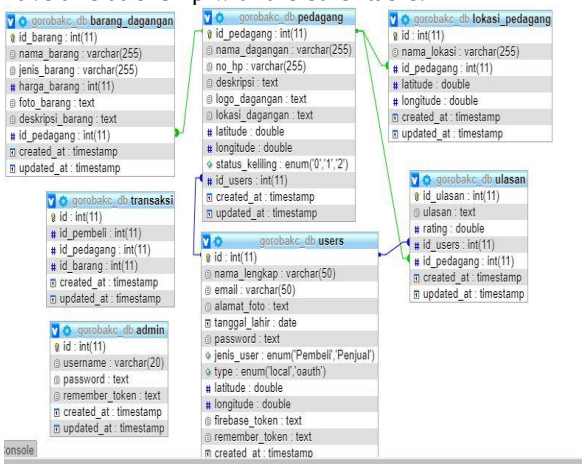

Image 6. Relationship scheme

2.5 Interface Design

Interface design is a communication mechanism between users and systems. The interface can receive information from users and provide information to users to help direct the search path to the problem until a solution is found.

1. Register interface

In this interface, it describes how the display of the register page will be used by the user.

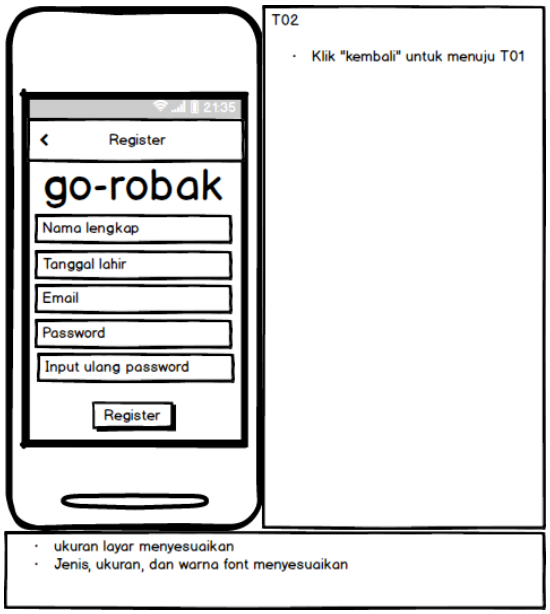

Image 7. Register Interface

2. Login Interface

This interface illustrates how the display of the login page will be used by the user.

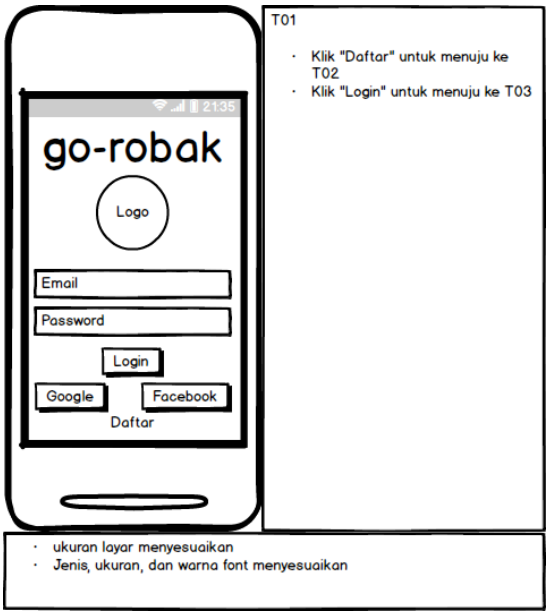

Image 8. Login Interface

3. Account Interface

This interface illustrates how the appearance of the account page that will be used by users.

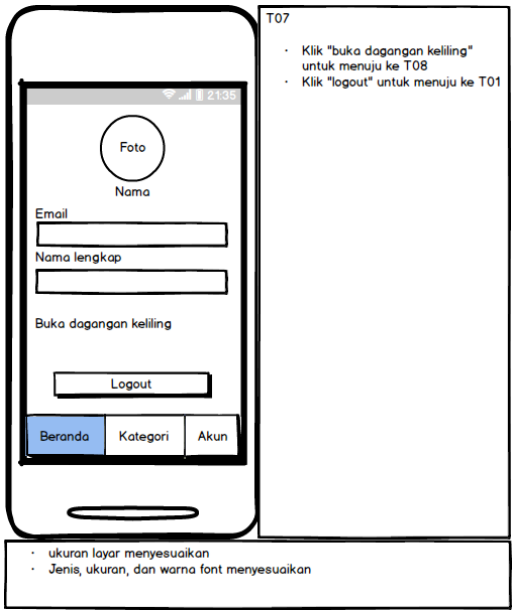

Image 9. Account Interface

4. Category Interface

In this interface, it is illustrated how the appearance of the category page will be used by the user.

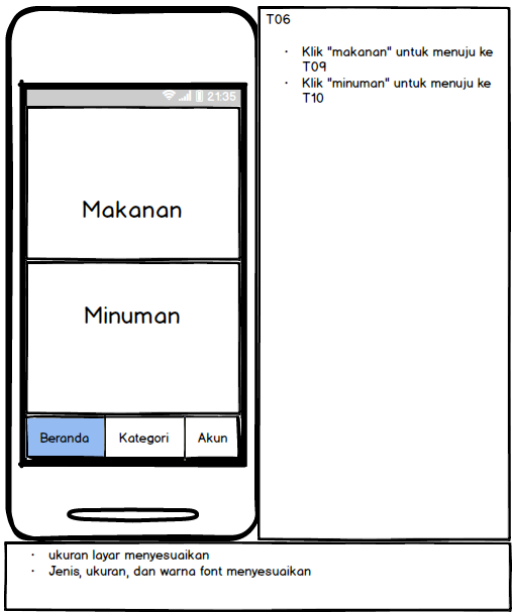

Image 10. Category Interface

5. Radius Interface

This interface illustrates how the appearance of the radius page will be used by the user.

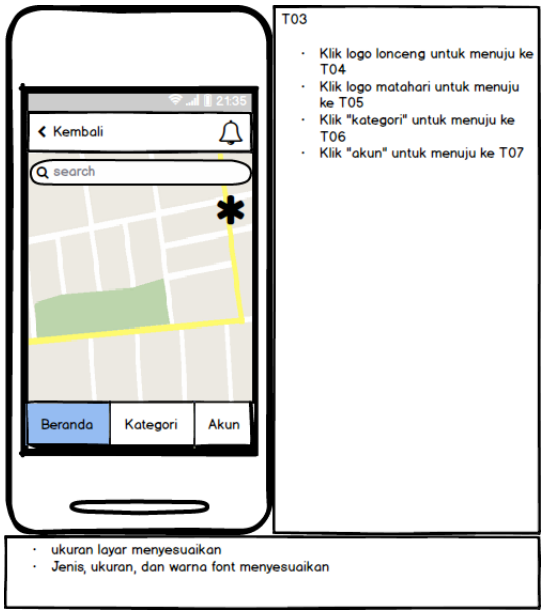

Image 11. Radius Interface

6. Notification Interface

This interface illustrates how the display of the notification page will be used by the user.

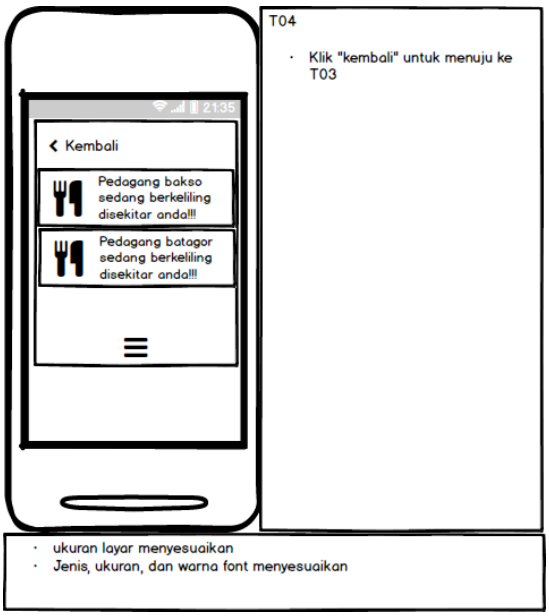

Image 12. Notification Interface

3. CLOSING

3.1 Conclusion

Based on the results of the implementation and testing that has been carried out, the conclusion of the final assignment entitled Development of Smart Applications Recommended by Mobile Food Traders Using Push Notification and Location Based Service (LBS) based on Android are as follows :

1. Users are facilitated in getting buyers or customers.
2. Users are facilitated in obtaining information about places and strategic weather situations.
3. Users are facilitated in getting information about schedules and travel routes for traders and buyers.

3.2 Suggestion

In the development of the Smart application Recommendations for Roving Food Traders Using Push Notification and Location Based Service (LBS) based on Android still has many disadvantages. The suggestions for the development of this application for the future are as follows:

1. Optimizing recommendations features to be more accurate in providing recommendations on places and routes.
2. Application development on smartphones that have an Android operating system architecture is different from those formalized by Google because the application is not fully suitable for some Android devices on the market.
3. Need to be adjusted if a new operating system has been released because the application might be difficult to reach API that functions to access Android smartphone hardware.

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