

# The Development Of Travel Recommendation Application In West Sumatra Based On Android

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## ABSTRACT

West Sumatra is an area in the western part of Sumatra island adjacent to North Sumatra, Riau, South Sumatra, and Bengkulu. Provinces that hold this annual Tour De Singkarak event have various tourist destinations, ranging from nature tourism. Culinary tourism, cultural tourism to historical tourism. Based on the results of questionnaires distributed on February 22, 2018 to February 25 2018 to 70 respondents, it is known that as many as 64.3% of prospective tourists have difficulty in planning a tour trip such as cost planning, nearby tourist routes, information about tourist attractions, ticket prices, and weather in tourist attraction. The basic map used in this application is Google Maps. This application utilizes API (Application Programming Interface) such as Google API, OpenWeatherMap API, and GPS that are on Android devices. Based on the results of alpha and beta tests that have been carried out in the implementation and testing stages, it can be concluded that the development of an application for a recommendation of travel in West Sumatra based on Android can help potential tourists to find tourist recommendations in West Sumatra and see weather forecasts in tourist attractions. before visiting the tourist attraction.

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

## 1. INTRODUCTION

West Sumatra is an area in the western part of Sumatra island adjacent to North Sumatra, Riau, South Sumatra, and Bengkulu. The West Sumatra region occupies the west coast of central Sumatra island and several islands off its coast such as the Mentawai Islands. The majority of the population of West Sumatra are Minangkabau and speak Minang.

The province that organizes the annual Tour De Singkarak program has various tourist destinations, ranging from nature tourism, culinary tourism, cultural tourism to historical tourism. Tourists who come to West Sumatra are not only domestic tourists but also international tourists.

As new tourists or will visit West Sumatra sometimes having difficulty in planning the cost and

the nearest tourist route, as well as information about tourist attractions, ticket prices, and sometimes also experience problems with the weather when visiting the tourist attractions. Many tourists, especially those from outside the city, find it quite difficult to find locations and complete and accurate information. From the results of questionnaires distributed on February 22, 2018, to February 25, 2018, to 70 respondents, it is known that as many as 64.3% of prospective tourists have difficulty planning a tour. Sometimes they have difficulty preparing a budget to visit several places, and run out or lack of money when traveling. Another difficulty is that it is difficult to determine the nearest route between tourist attractions and sometimes there are tourists who are constrained by the weather while at tourist attractions.

From research written by Triyono and friends [1] the application that they build is giving information and being a guide to the direction of the tourist location they want to go to. This application is designed like a tour guide that makes it easier for tourists to get information-information including culinary data, tourist attractions, hotels, arts, places of worship and transportation. In building this android platform application using Google API tools, JDK as a programming language, SDK, Android Virtual Device for configuration of emulators and SQLite as its database. The method used is the Location Based Services (LBS) method. Minimum A-GPS accuracy testing error with a distance of 3 meters and a maximum error of 30 meters. GPS accuracy testing is assisted by the GPS Test and GPS Status applications.

From other studies written by Akhmad [2] Based on the final results obtained from the development of Android-based applications, it was concluded that one way to improve public information about the search for tourist attractions by presenting something new on digital aids media, by using this application those in need can see and get information directly without having to bother asking other people, so users can directly search for what they want.

Often tourists when visiting a tourist spot find bad weather or even rain. The irregular and extreme climate and weather patterns in Indonesia will interfere [3]. Of course, it will cause disappointment to the tourists, what else tourists come all the way from outside the area. Therefore, using OpenWeatherMap API technology will provide

weather forecasts before tourists visit the place. The data obtained from OpenWeatherMap is information about location, weather, weather description, icons, humidity, wind pressure, air temperature, wind speed, wind direction, and clouds stored in JSON format [4].

According to research written by Agus and friends [5] the development of mobile devices that are widely discussed today is Android. Android is an Operating System (OS) that runs on mobile devices and is open source. Android has supported various tools and APIs for making mobile programs including accessing Google Maps. Many people have relied on mobile devices to obtain information.

From other studies written by Even [6] concluded, the application built can help tourists to get information on tourist objects. The application can also provide hotel information nearby from tourist attractions. As well as public transport recommendations and information on selling typical foods.

People are now making friends using various types of smartphones, especially Android. This is in accordance with the ability, motivation, desires, and needs of the community towards the use of the media [7]. From the results of the questionnaire given to 70 respondents, 100% were smartphone users and 91.4% used Android smartphones.

## 2. CONTENTS OF RESEARCH

### 2.1 Theoretical basis

The theoretical basis explains some theories and explanations relating to the application or media to be built. The theoretical foundation used in the preparation of the Application of Tourist Travel Recommendations in West Sumatra Android-Based, includes Tourism, West Sumatra, Recommendations, Android, GPS, Google Maps, OpenWeatherMap.

#### 2.1.1 Tourism

Tourism is a series of activities related to the human movement that travels or temporarily stops from their place of residence to one or several destinations that have been or have not been visited outside the residential area caused by several needs without intending to make a living. Tourism is one of the sectors driving the economy that needs to be given more attention by the government and its people so that it can develop well [8].

#### 2.1.2 West Sumatra

West Sumatra is an area in the western part of Sumatra island adjacent to North Sumatra, Riau, South Sumatra, and Bengkulu. The West Sumatra region occupies the west coast of central Sumatra island and several islands off its coast such as the Mentawai Islands. The majority of the population of West Sumatra are Minangkabau and speak Minang. Attractions in West Sumatra are very diverse, ranging from nature tourism, culinary tourism, cultural tourism to historical tourism.

The following is a list of tourist attractions in West Sumatra:

**Table 1.** List of tourist attractions

No.	Name	Address	Coordinate
1.	Air Terjun Timbulun Painan	Painan, Iv Jurai, Painan, Iv Jurai, Kabupaten Pesisir Selatan	-1.346422, 100.602805
2.	Ngalau Indah	Pakan Sinayan, Payakumbuh Bar., Kota Payakumbuh	-0.254747, 100.604329
3.	Air Terjun Lembah Anai	Singgaling, Sepuluh Koto, Kabupaten Tanah Datar	-0.483938, 100.337825
4.	Air Terjun Nyarai	Lubuk Alung, Kabupaten Padang Pariaman	-0.683394, 100.363231
5.	Lobang Jepang	Jl. Panorama, Bukit Cangang Kayu Ramang, Guguk Panjang, Kota Bukittinggi	-0.307502, 100.366108
6.	Puncak Langkisau	Salido, Iv Jurai, Kabupaten Pesisir Selatan	-1.340401, 100.574127
7.	Pantai Pasir Jambak	Jl. Teratai, Pasie Nan Tigo, Koto Tangah, Kota Padang	-0.825092, 100.298163
8.	Janjang Koto Gadang	Kayu Kubu, Mandiangin Koto Selayan, Kota Bukittinggi	-0.311794, 100.363388
9.	Ngarai Sianok	Jl. Panorama, Bukit Cangang Kayu Ramang, Guguk Panjang, Kabupaten Agam	-0.307943, 100.364190
10.	Benteng Fort de Kock	Jl. Yos Sudarso, Benteng Ps. Atas, Guguk Panjang, Kota Bukittinggi	-0.300118, 100.367663
11.	Taman Margasatwa dan Budaya Kinantan	Jl. Cindua Mato, Benteng Ps. Atas, Guguk	-0.300100, 100.369624

No.	Name	Address	Coordinate
		Panjang, Kota Bukittinggi	
12.	Pantai Cermin	Karan Aur, Pariaman Tengah, Kota Pariaman	-0.635882, 100.122536
13.	Objek Wisata Ikan Sakti Sungai Janiah	Koto Baru, Baso, Kabupaten Agam	-0.262394, 100.457335
14.	Pantai Batu Kalang	Ampang Pulai, Koto XI Tarusan, Kabupaten Pesisir Selatan	-1.266481, 100.441262
15.	Puncak Mandeh	Ampang Pulai, Koto XI Tarusan, Kabupaten Pesisir Selatan	-1.238479, 100.433910
16.	Objek Wisata Malibo Anai	Guguak, 2 X 11 Kayu Tanam, Kabupaten Padang Pariaman	-0.500719, 100.332863
17.	Puncak Lawang	Lawang, Matur, Kabupaten Agam	-0.263757, 100.242477
18.	Pantai Tiram	Tiram, Tapakis, Ulakan Tapakis, Kabupaten Padang Pariaman	-0.717406, 100.203305
19.	Panorama Tabek Patah	Tanjung Alam, Tanjung Baru, Tj. Alam, Tj. Baru, Kabupaten Tanah Datar	-0.317005, 100.536475
20.	Puncak Gagoan	Paninggahan, Junjung Sirih, Solok	-0.673836, 100.508513
21.	Danau Biru Sawahlunto	Tumpuak Tengah, Talawi, Kota Sawah Lunto	-0.592601, 100.797903
22.	Pantai Gandoriah	Pasir, Pariaman Tengah, Kota Pariaman	-0.626865, 100.116109
23.	Laing Park	Kampung Jawa, Tanjung Harapan, Laing, Tj. Harapan, Solok	-0.751497, 100.666440

No.	Name	Address	Coordinate
24.	Pantai Carocok	Iv Jurai, Kabupaten Pesisir Selatan	-1.351968, 100.565318
25.	Pulau Pasumpahan	Jalan Sungai Pisang, Tlk. Kabung Sel., Bungus Tlk. Kabung, Kota Padang	-1.117905, 100.367656
26.	Panorama Ampangan	Aua Kuniang, Payakumbuh Selatan, Ampangan, Payakumbuh, Kota Payakumbuh	-0.269232, 100.646139
27.	Istano Basa Pagaruyung	Jl. Sutan Alam Bagagarasyah, Pagaruyung, Tj. Emas, Kabupaten Tanah Datar	-0.471060, 100.621373
28.	Benteng Van der Capellen	Baringin, Lima Kaum, Kabupaten Tanah Datar	-0.454337, 100.595990
29.	Pulau Angso Duo	Pasir, Pariaman Tengah, Kota Pariaman	-0.632958, 100.099847
30.	Janjang Saribu	Bukit Apit Puhun, Guguk Panjang, Kota Bukittinggi	-0.301409, 100.357423
31.	Jam Gadang Bukittinggi	Jalan Parak Kubang, Benteng Pasar Atas, Guguk Panjang, Kota Bukittinggi	-0.304923, 100.369509

### 2.1.3 API (Application Programming Interface)

The API is an interface used to access applications or services from a program. The API allows developers to use functions that already exist in other applications so that developers do not need to re-create from scratch. In the web context, the API is a function call via Hyper Text Transfer Protocol (HTTP) and gets a response in the form of Extensible Markup Language (XML) or JavaScript Object Notation (JSON). Function calls to a particular site will generate different responses to users to build enterprise applications on a website [9].

### 2.1.4 Google Maps Android API

The Google Maps Android API is a service to display maps in the android application. The Google Maps API is a library in the form of JavaScript [10]. Developers can add maps to data-based applications in the Google Maps API automatically handle access to Google Maps servers, download data, display maps, and respond to map movements. You can also

use an API call to add markers, polygons, and overlays to the base map, and change the appearance of certain map areas to users. All of these objects provide additional information about the location of the map and allow user interaction with maps.

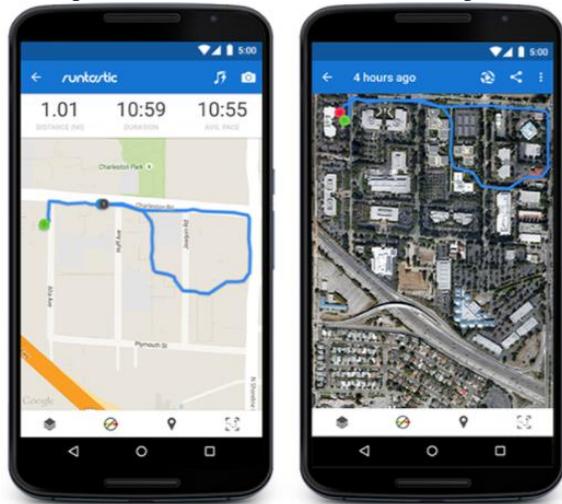


Image Source :  
<https://developers.google.com/maps/?hl=id>  
**Figure 1.** Google maps on Android

### 2.1.5 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.

#### 2.1.5.1 How to use the Openweathermap API

Following are the steps on how to use the OpenWeatherMap API :

1. Obtain the key API by registering an account at the website address:  
[https://home.openweathermap.org/users/sign\\_up](https://home.openweathermap.org/users/sign_up)

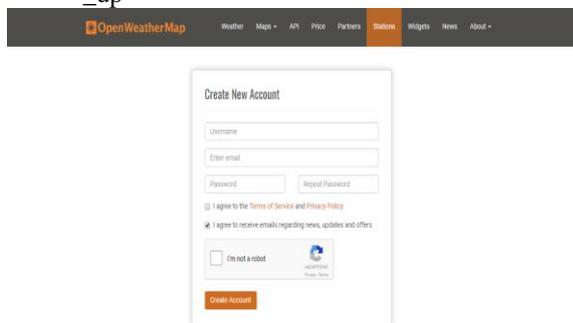


Image Source :  
[https://home.openweathermap.org/users/sign\\_up](https://home.openweathermap.org/users/sign_up)  
**Figure 2.** Register page

2. Activation of the API key for the free version and takes 10 minutes.

3. After getting the API key, call it via the link:  
<http://api.openweathermap.org/data/2.5/forecast?id=524901&APPID={APIKEY}>
4. APPID {APIKEY} is a unique API key that has been obtained.

### 2.2 Research methods

This study uses the waterfall paradigm, which contains various processes as follows :

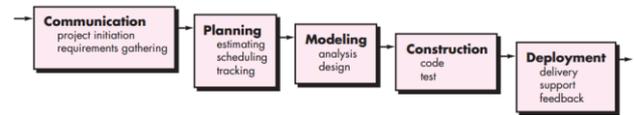


Image Source : R. Pressman  
**Figure 3.** Waterfall Model Cycle

#### 1. Communication

At this stage, needs analysis is carried out related to community mobility in the city of Bandung with many routes of public transport routes in this city that are not accompanied by sufficient information so as to cause confusion. And the stage for conducting data collection is by conducting a questionnaire to get facts.

#### 2. Planning

At this stage will continue the communication process, namely from the results of the analysis and data collection in obtaining a user requirement document or document related to the user's wishes in making the application and planning the maker.

#### 3. Modelling

At this stage, implementation of the application needs is needed in the form of presentation interface and application architecture as a series of application design for the front-end in providing informative information to the users of this application from the results of back-end system processing.

#### 4. Construction

At this stage, the application design is implemented in the form of a code or a series of program units. Implementation at this stage uses firebase as the back-end system that is built and Android Studio as the front-end. Then testing the program is to find errors in the system.

#### 5. Deployment

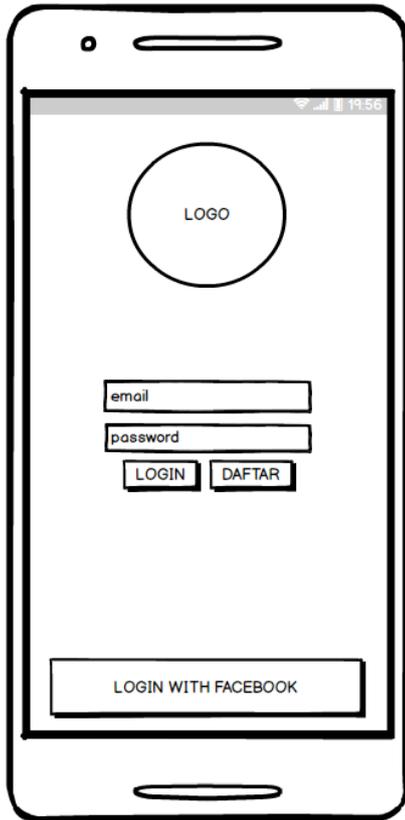
After analysis, modeling, and coding, the application can be used. In the deployment, stage results are obtained and also feedback from the use of the application that has been designed.

### 2.3 Interface Design

Designing an Android interface is a design or mockup that is implemented for users. The following is the design of the Android Interface found in the construction of this application.

#### a. Login View

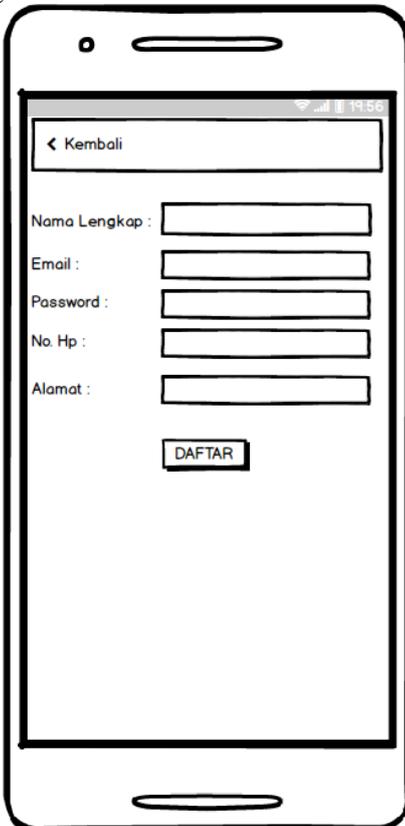
The login view is used to enter the system using a username and password.



**Figure 4.** Login View

b. Register View

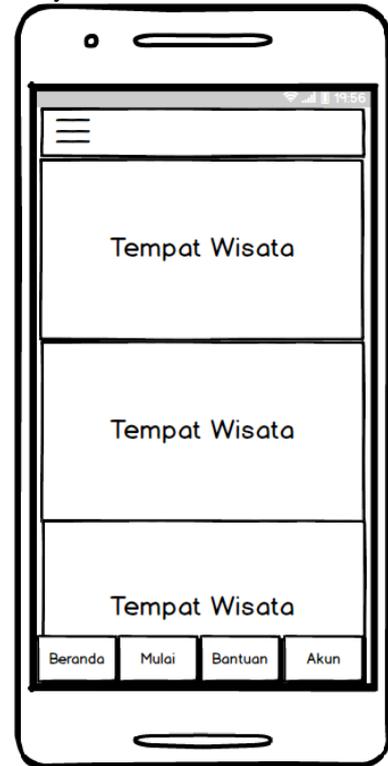
Register view is used to register before logging in.



**Figure 5.** Register View

c. Home View

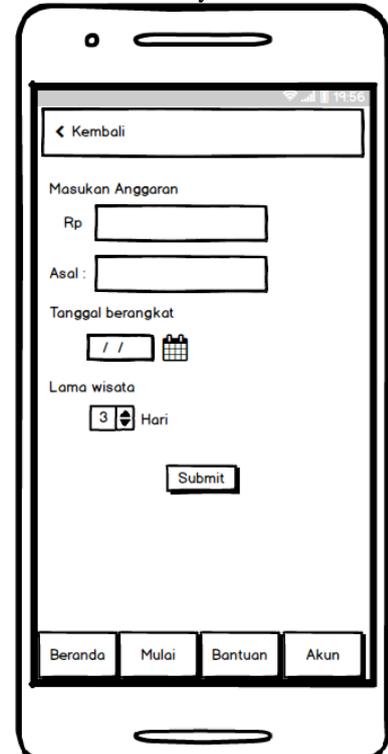
The home screen is used to display the main page of the system.



**Figure 6.** Home View

d. Start Searching For Recommendations

The appearance of starting to look for recommendations is used to look for tourist recommendations on the system.



**Figure 7.** Start Searching For Recommendations

## 2.4 Relationship Scheme

In designing a relation scheme each table must have a relationship with the other tables. If there is no relationship between tables, it can be said that modeling to make one database is a failure.

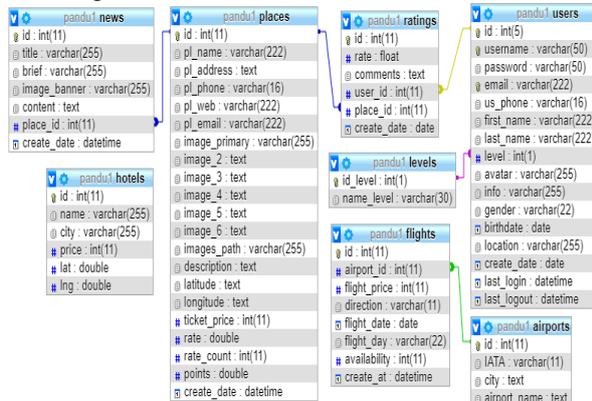


Figure 8. Relationship Scheme

## 2.5 Database Implementation

Database implementation is an implementation based on a previously created database design. Physically this database implementation uses MySQL. The following is the builder syntax of the database used:

Table 2. Database Implementation

No.	Table Name	SQL Command
1	airports	CREATE TABLE `airports` ( `id` int(11) NOT NULL, `IATA` varchar(11) NOT NULL, `city` text NOT NULL, `airport_name` text NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
2	flights	CREATE TABLE `flights` ( `id` int(11) NOT NULL, `airport_id` int(11) NOT NULL, `flight_price` int(11) DEFAULT NULL, `direction` varchar(11) DEFAULT NULL, `flight_date` date DEFAULT NULL, `flight_day` varchar(22) DEFAULT NULL, `availability` int(11) DEFAULT NULL, `create_at` datetime NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
3	hotels	CREATE TABLE `hotels` ( `id` int(11) NOT NULL, `name` varchar(255) DEFAULT NULL, `city` varchar(255) DEFAULT NULL, `price` int(11) NOT NULL,

No.	Table Name	SQL Command
		`lat` double DEFAULT NULL, `lng` double DEFAULT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
4	levels	CREATE TABLE `levels` ( `id_level` int(1) NOT NULL, `name_level` varchar(30) NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
5	news	CREATE TABLE `news` ( `id` int(11) NOT NULL, `title` varchar(255) NOT NULL, `brief` varchar(255) NOT NULL, `image_banner` varchar(255) NOT NULL, `content` text NOT NULL, `place_id` int(11) NOT NULL, `create_date` datetime NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
6	places	CREATE TABLE `places` ( `id` int(11) NOT NULL, `pl_name` varchar(222) NOT NULL, `pl_address` text NOT NULL, `pl_phone` varchar(16) NOT NULL, `pl_web` varchar(222) NOT NULL, `pl_email` varchar(222) DEFAULT NULL, `image_primary` varchar(255) DEFAULT NULL, `image_2` text, `image_3` text, `image_4` text, `image_5` text, `image_6` text, `images_path` varchar(255) DEFAULT NULL, `description` text NOT NULL, `latitude` text NOT NULL, `longitude` text NOT NULL, `ticket_price` int(11) DEFAULT NULL, `rate` double DEFAULT NULL, `rate_count` int(11) DEFAULT NULL, `points` double DEFAULT NULL,

No.	Table Name	SQL Command
		<code>`create_date` datetime NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;</code>
7	ratings	<code>CREATE TABLE `ratings` ( `id` int(11) NOT NULL, `rate` float NOT NULL, `comments` text NOT NULL, `user_id` int(11) NOT NULL, `place_id` int(11) NOT NULL, `create_date` date NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;</code>
8	users	<code>CREATE TABLE `ratings` ( `id` int(11) NOT NULL, `rate` float NOT NULL, `comments` text NOT NULL, `user_id` int(11) NOT NULL, `place_id` int(11) NOT NULL, `create_date` date NOT NULL ) ENGINE=InnoDB DEFAULT CHARSET=latin1;</code>

## 2.6 System Testing

Testing is an important part of the software development cycle. The purpose of this test is to ensure that the software that is built has reliable quality. Testing of the program itself aims to make the program run smoothly without experiencing interruption or error and allows for further system development.

Based on the results of testing the system with the black box method it was concluded that almost all functions on the system can run normally. There are only a few minor errors found but do not affect the main function of the system.

## 3. CLOSING

### 3.1 Conclusion

Based on the results of the implementation and testing that has been carried out, the conclusions of the final project entitled the development of application recommendations for travel tours in West Sumatra based on Android are as follows:

1. Users are facilitated in planning a trip based on costs in West Sumatra.
2. Users are facilitated in determining the nearest route from each tourist place.
3. Users are facilitated in viewing weather forecasts at tourist attractions in West Sumatra before visiting the place.

### 3.2 Suggestion

In the construction of application development application recommendations for travel in West Sumatra based on Android, this still has many shortcomings. The suggestions obtained for this application are as follows:

1. Increase the duration of weather prediction from the previous 5 days to be longer so that potential tourists can find out weather conditions from long ago.
2. Optimizing recommendation features to be more accurate in providing recommendations for tourist attractions.

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