

AN APPLICATION DEVELOPMENT BASED ON ANDROID FOR TRAVELING RECOMMENDATION TO NATURAL TOURISM IN TIMOR ISLAND - NTT

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ABSTRACT

Timor Island is an island in the province of East Nusa Tenggara (NTT), which covers an area of 4,937.62 km². With the richness of culture owned, making Timor Island has the potential to increase regional economic growth through the tourism sector. Problems that arise due to lack of information about natural attractions found on Timor Island so that potential tourists do not know the information recommendations for nature tourism attractions. There are also tourists who want to take a vacation to natural attractions but have trouble getting weather forecast information on Timor Island. Based on the results of the tests that have been carried out, the application built aims to facilitate tourists to get recommendation information for natural attractions and weather forecasts in one application, then create an application on the Android mobile platform that is public.

Keyword : Natural Tourism Attractions, Timor Island, Android, Mapbox, Openwether API.

1. INTRODUCTION

1.1 Background

Timor Island is an island in the province of East Nusa Tenggara (NTT), which covers an area of 4,937.62 km². The island with the nickname "Nusa Sandalwood" also stores natural beauty that many tourists still don't know in the area or outside the region. Tourism on Timor Island offers goods and exotics. Because of the lack of information on natural attractions found on Timor Island, often tourists who want to take a vacation to Timor Island experience difficulties in getting information about natural attractions and weather predictions at these locations.

Based on the results of questionnaires distributed to 106 respondents online through Google Form, 60.9% of tourists who had just visited Timor Island experienced difficulties in obtaining information on natural tourist recommendation locations and tourist attraction information on Timor Island. 73% tourists who want to go to Timor Island also have difficulty

getting weather prediction information from the destination.

The existence of a location-based service system or better known as Location Based Service can make it easier for users to get information based on location. In the previous research, LBS was used to facilitate tourists to determine the location of tourist objects, coordinates and supporting information about tourist objects in Tegal [1] and other studies use LBS to provide information about tourist attractions and creative industries [2].

The information obtained can be visualized using digital maps such as Mapbox. Mapbox is often used in applications that require maps such as the Trans Padang mass search route application [3]. In this study utilizing MapBox API in finding the shortest route and providing geocoding information and directions from two starting point nodes and destination point nodes [4].

To get information about the weather in the destination location, software developers can utilize Open Weather. Open Weather is used to get temperature information around the location. Besides providing weather information, Open Weather also displays information in the form of temperature, which will be changed from Kelvin to Celsius units [5].

Based on the problems obtained and the explanation of the technology that has been used before, a solution is made to make it easier for prospective tourists to travel, namely by building an Android-based application to recommend information on natural attractions and weather predictions at tourist sites on Timor Island.

1.2 Research Purposes

The purpose of this research is to make it easier for tourists to find out information on what natural tourist location recommendations are found on Timor Island and make it easier for tourists to predict natural weather predictions in Timor Island natural attractions.

2. RESEARCH CONTENTS

2.1 Research Methodology

The methodology research used is descriptive method. Descriptive method is a method of examining the status of a group of people, an object, a set of conditions, a system of thought or a class of events in the present. The purpose of this descriptive research is to make a systematic, factual and accurate description, description, or painting of facts, traits and relationships between phenomena investigated [6]. For software development using the waterfall method. Stages in the waterfall method can be seen in Figure 1.

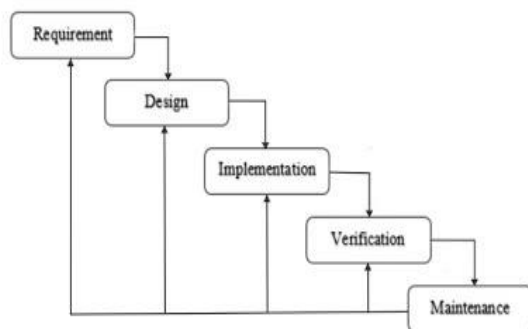


Figure 1. Stages in the waterfall

Explanation of the waterfall stage is as follows :

1. Requirement Analysis

At this stage, the researcher multiplies the information in the form of what needs and problems must be solved by the system. Information can be used together, interviews or by conducting direct surveys.

2. System Design

After requirement analysis, the next step is to design the system to be built. System design is usually in the form of a use case diagram, interface design, and system architecture.

3. Implementation

At the design stage then implemented into the system. Implementation is carried out periodically for each feature. Then each unit will be combined into one complete system.

4. Integration and Testing

After the system is created, it will then be tested whether the system is running well or not. In addition to checking the system running with or not functionally, the system will also be tested whether the system built has solved the problem that will be solved or not.

5. Maintenance

After the system runs well and successfully resolves the problem, the system will then be

corrected from an error. Additional features also occur at this stage.

2.2 Android

Android is an operating system for smartphones and tablets. Operating System can illustrate as a "bridge" between the device (device) and user. So users can run applications available on the device. In the PC world (Personal Computers), the most widely used operating systems are Windows, Mac, and Linux [7].

2.3 MySQL

MySQL is a database management system that is open source. The point is that MySQL can be downloaded by anyone, both the original version of the program code and the binary version and can be used (relatively) free both to be modified according to one's needs and as a computer application program [8].

2.4 API

API (Application Programming Interface) is a link or waiter used to access applications or services from a program. The API allows developers to use existing functions from other applications. So they do not need to 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 produce a different response [9].

2.5 JSON

JSON (JavaScript Object Notation) is a data exchange format that is simple, universal, and easily parsed by a computer. JSON is a text format that does not depend on any programming language. Because of these properties, make JSON very suitable as a data-exchange language for multiplatform applications [10].

2.6 GPS

GPS is a radio-based navigation system that provides location-based information. The system works using a satellite that functions as a signal sender. The information provided is in the form of information on the coordinates of the location, speed, direction and time on the GPS signal receiver on the surface of the earth. [11]. How the GPS works can be seen on Figure 2.

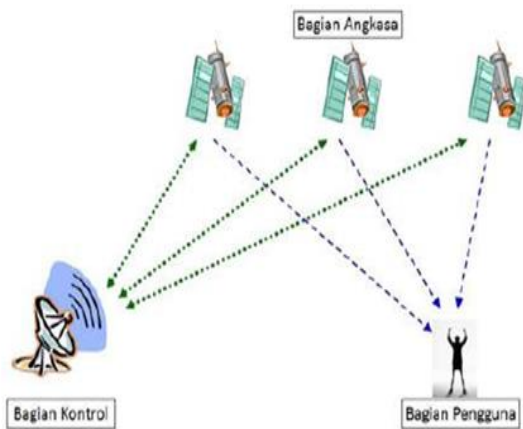
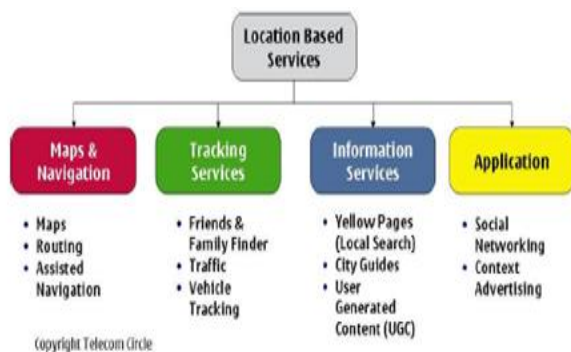


Figure 2. Example of how a GPS works

2.7 LBS

Location Based Service is one of the services provided by Android to access information on the location of the device users [12]. Based on the services provided, can be classified into four types, namely Maps and Navigation, Tracking Services, Information Services and Applications, as illustrate at Figure 3.



Source : <http://www.telecomcircle.com/2009/06/introduction-to-lbs/>

Figure 3. LBS Classification

2.7 MapBox API

MapBox API is one of the digital map service providers for various platforms. For own mapping data MapBox uses base tiles from Open Street Maps and also from several other sources such as NASA, Digital Globe, and USGS [4].

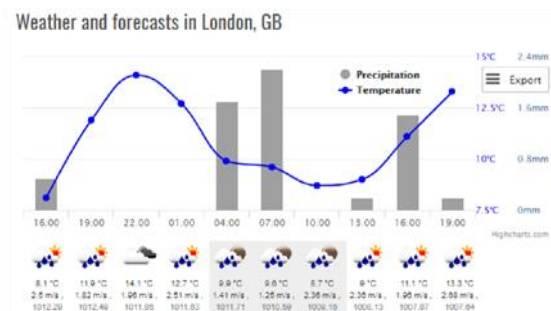
The following is a digital map on MapBox can be seen in Figure 4:



Figure 4. Example of Mapbox

2.8 Open Weather API

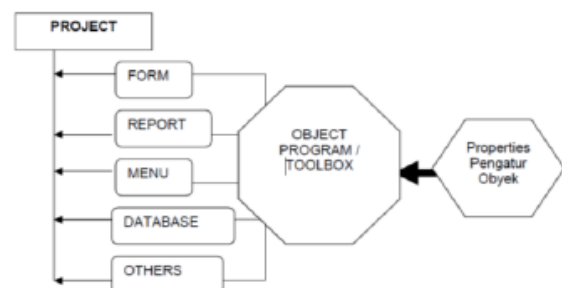
The Open Weather API is one of the APIs that provides weather data, weather forecasts, and the latest historical data for developers who need weather integrations inbuilt applications [5]. Data sources used are data sources from meteorological broadcast services, raw data from airport weather stations, raw data from radar stations, and raw data from other official weather stations. Examples of weather data from Open Weather can be seen in Figure 5.



Source : <https://openweathermap.org>
Figure 5. Sample Open Weather Maps API data

2.10 Object Oriented Programming

Object-oriented programming or OOP is a programming approach that uses objects and classes. In OOP, every part of the program is an object. An object represents a part of the program that will be completed [13]. The OOP Programming Model can be seen in Figure 6.



Source : E-journal Infokam [13]
Figure 6. OOP Programming Model

2.11 System Planning

System design is a description, planning, and sketching or arrangement of several elements

contained in the Nature Tourism Recommendation software on Timor Island.

2.11.1 User Characteristics

An application will work optimally if the user has the ability to operate the software properly. This software will be used by 2 types of users, which is administrators and users. User characteristics needed can be seen in Table 1.

Table 1. User characteristics

User	Requirement
Administrator	<ol style="list-style-type: none"> 1. Understand using a computer. 2. Understand how to operate travel recommendation software.
User	<ol style="list-style-type: none"> 1. Able to operate an Android Smartphone. 2. Able to do tourism activities. 3. Accustomed to using mobile social media applications.

2.12 Sequence Diagram

The sequence diagram is an illustration of the interaction of each object in each use case in a time sequence. This interaction is in the form of sending a series of data between objects that interact with each other. The following are sequence diagrams that can be illustrated, including:

1. Homepage sequence diagram can be seen in Figure 7.

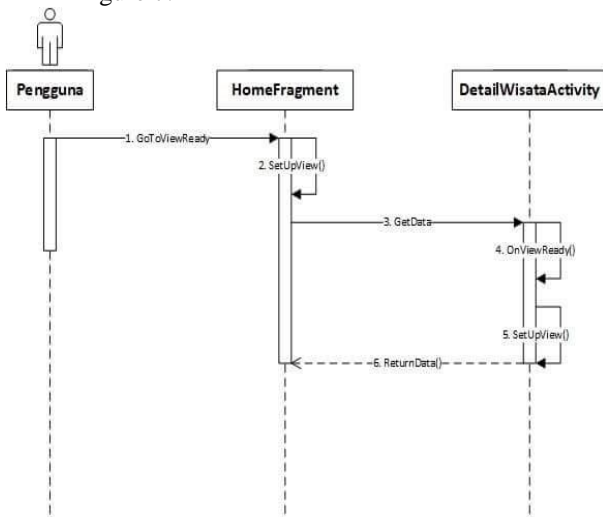


Figure 7. Homepage sequence diagram

2. Travel Destination Sequence diagrams can be seen in Figure 8.

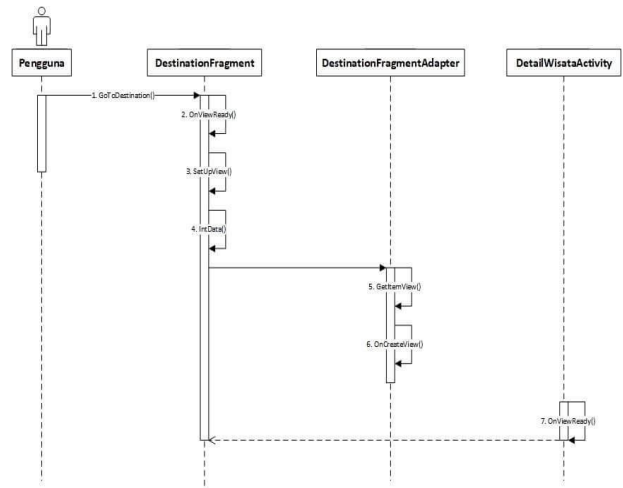


Figure 8. Travel destination sequence diagrams

3. Weather Forecast Sequence diagrams can be seen in Figure 9.

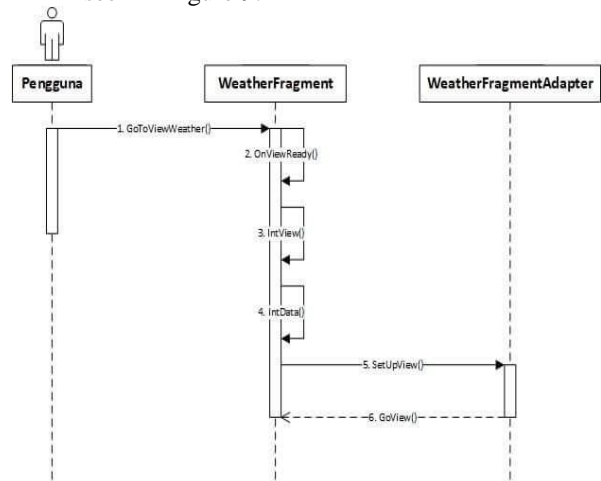


Figure 9. Weather Forecast sequence diagram

4. Search tourist attractions Sequence diagrams can be seen in Figure 10.

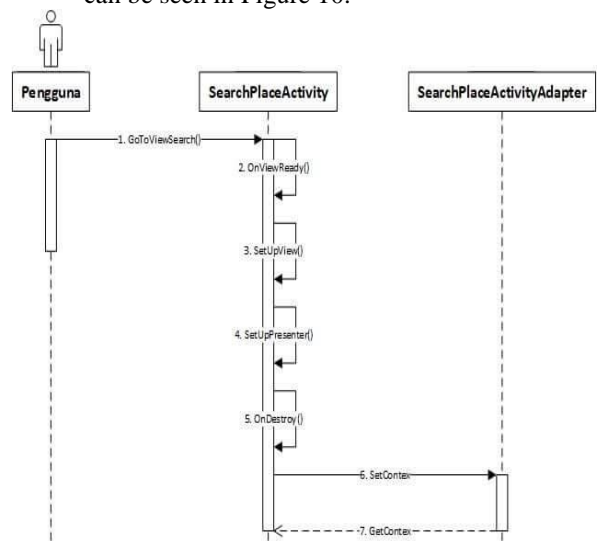


Figure 10. Search tourist attractions sequence diagram

2.13 Interface Design

The interface design on the mobile platform application for Recommendations for Nature Tourism on the Island of Timor can be seen in the pictures below.

The design of the travel destination interface can be seen on Figure 11.

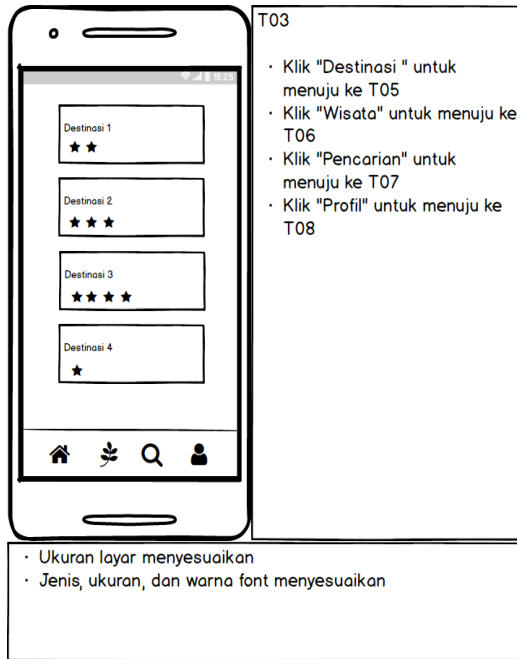


Figure 11. Tourist attractions list

The design of tourist location Search interface can be seen on Figure 12.



Figure 12. Search tourist attraction detail page

The design of decovery interface can be seen on Figure 13

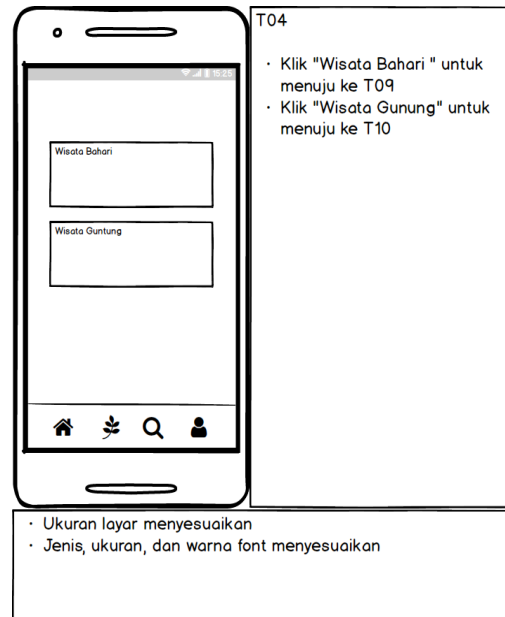


Figure 13. Decovery pages

2.14 Data Planning

Data design is a stage to map the conceptual model to the database model that will be used. Database design is divided into two, namely the relation scheme and table structure design can be seen as follows:

2.14.1 Relationship Scheme

The relation scheme is a series of relationships between two tables or more in the database system. Figure 14 is a database set design in the application for Recommendations for Nature Tourism on Timor Island.

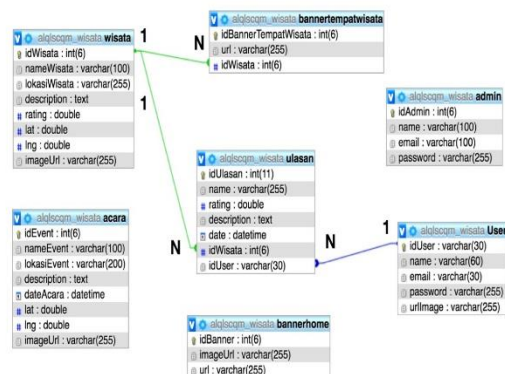


Figure 14. Relation scheme

2.14.2 Table Structure

The table structure describes the Table details that contain fields, data types, data lengths, and other information. The tables found in the database of application recommendations for natural attractions on Timor Island are Table t_admin, t_user, t_bannerhome, t_acara, t_wisata, t_ulasan and t_bannertempat places that can be seen in the table below.

Table 2 describes the table structure of t_admin.

Table 2. Admin Table

Field	Data Type	Length	Key
idAdmin	int	6	Primary key
name	Varchart	100	
email	Varchart	100	
password	Varchart	255	

Table 3 describes the table structure of t_user.

Table 3. User Table

Field	Data Type	Length	Key
idUser	int	30	Primary key
name	Varchart	60	
email	Varchart	30	
password	Varchart	255	
UrlImage	Varchar	255	

Table 4 describes the table structure of t_banner.

Table 4. Banner Table

Field	Data Type	Length	Key
idBanner	int	6	Primary key
imageUrl	Varchart	255	
Url	Varchart	255	

Table 5 describes the table structure of e t_acara.

Table 5. Event Table

Field	Data Type	Length	Key
idEvent	int	6	Primary key
namaEvent	Varchart	100	
lokasiEvent	Varchart	200	
description	Text		
dateAcara	datetime		
Lat	Double		
Lng	Double		
imageUrl	Varchart	255	

Table 6 describes the table structure of t_wisata.

Table 6. Wisata Table

Field	Data Type	Length	Key
idWisata	int	6	Primary key
namaWisata	Varchart	100	
lokasiWisata	Varchart	255	
description	Text		
dateAcara	datetime		
Lat	Double		
Lng	Double		
imageUrl	Varchart	255	

Table 7 describes the table structure of t_ulasan.

Table 7. Review Table

Field	Data Type	Length	Key
idReview	int	6	Primary key
name	varchart	255	
rating	double		
description	text		
date	datetime		
idWisata	int	6	

Table 3 describes the table structure of t_bannertempatwisata.

Table 8. Banner Destination Table

Field	Data Type	Length	Key
idBannerTempatWisata	int	6	Primary key
Url	Varchart	255	
idWisata	int	6	

2.15 Database Implementation

Database implementation is done using the MySQL DBMS application. For a database, implementation can be seen on a Table 9.

Table 9. Database Implementation

No	Table	MySQL Syntax
1	Event	<pre>CREATE TABLE `acara` (`idEvent` int(6) primary key AUTO_INCREMENT, `nameEvent` varchar(100) NOT NULL, `lokasiEvent` varchar(200) NOT NULL, `description` text, `dateAcara` datetime DEFAULT NULL, `lat` double DEFAULT NULL, `lng` double DEFAULT NULL, `imageUrl` varchar(255) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;</pre>

No	Table	MySQL Syntax
2	Admin	CREATE TABLE `admin` (`idAdmin` int(6) primary key AUTO_INCREMENT, `name` varchar(100) NOT NULL, `email` varchar(100) NOT NULL, `password` varchar(255) NOT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;
3	Home Banner	CREATE TABLE `bannerhome` (`idBanner` int(6) primary key AUTO_INCREMENT, `imageUrl` varchar(255) NOT NULL, `url` varchar(255) NOT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;
4	Destination Banner	CREATE TABLE `bannertempatwisata` (`idBannerTempatWisata` int(6) primary key AUTO_INCREMENT, `url` varchar(255) NOT NULL, `idWisata` int(6) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;
5	Review	CREATE TABLE `ulasan` (`idUlasan` int(6) primary key AUTO_INCREMENT, `name` varchar(255) NOT NULL, `rating` double DEFAULT NULL, `description` text, `date` datetime DEFAULT NULL, `idWisata` int(6) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;
6	Destination	CREATE TABLE `wisata` (`idWisata` int(6) primary key AUTO_INCREMENT, `nameWisata` varchar(100) NOT NULL, `lokasiWisata` varchar(255) NOT NULL, `description` text, `rating` double DEFAULT NULL, `lat` double DEFAULT NULL, `lng` double DEFAULT NULL, `imageUrl` varchar(255) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;

2.16 Menu Structure

Menu structure design is a Figure of application usage path so that applications are easy to understand and easy to use. The design of the menu structure of the Recommendation for Nature Tourism on Timor Island can be seen in Figure 15.

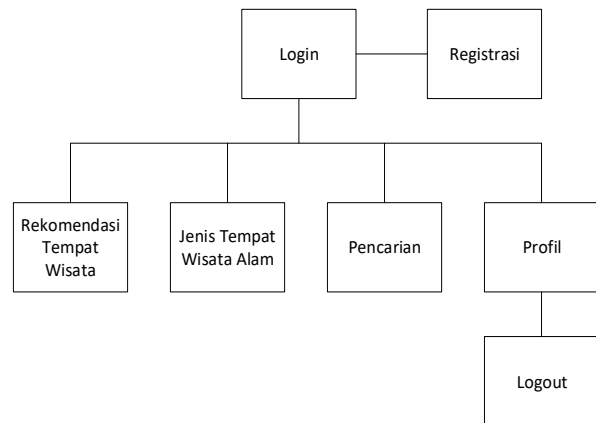


Figure 15. Menu Structure on mobile platform

2.17 System Testing

System testing is built using Acceptance Testing. Tests were carried out on August 1, 2018. Total respondents who participated in this test were 30 people. Testing is done by giving 4 questions. The question is based on the purpose of the research.

After testing it was found that 80% of respondents agreed that the Application of Recommendations for Nature Tourism on Timor Island Based on Android made it easier for tourists to get tourist information on Timor Island and 77% of respondents agreed that the application had made it easier for tourists to get weather prediction information.

3. RESULTS

3.1 Conclusion

Based on the results obtained from the stages that have been done through the process of planning, implementing, and testing applications, conclusions are obtained :

1. Application Recommendations for Nature Tourism on Timor Island Based on Android has made it easier for tourists to get information on recommendations for tourist attractions on the island of Timor.
2. The system built by tourists can be facilitated by weather forecast predictions in the next few days so that tourists who go to natural attractions can find out the right time to go to a tourist spot.

3.2 Sugestion

The system built by tourists can be facilitated by weather forecast predictions in the next few days so that tourists who go to natural attractions can find out the right time to go to a tourist spot.

REFERENCES

- [1] Fuad Hadiansah dan Gianjar Wiro Sasminto, "Implementasi Location Based Service Rute Objek Wisata Tegal," *Infotel*, vol. 7, no. 2, 2 November 2015.

- [2] Deden A. W, Eko Budi Setiawan dan Rahma W, "Information of Tourism and Creative Industry Using Mobile Application Technology," *International Journal of New Media Technology*, vol. 4, no. 2, p. 120, 22 Desember 2017.
- [3] Hafiz N. Djufri, R. H. Ginard dan Dini Adni N, "Rancang Bangun Layanan Informasi Trans Padang Berbasis Web," *Jurnal Teknik ITS*, vol. 6, no. 4, pp. 100-104, 2017.
- [4] Suryo Atmojo, "Teori Permutasi dan Penggunaan API MapBox untuk Pencarian Rute Terpendek," *Jurnal Ilmiah Edutic*, vol. 4, no. 2, pp. 2407- 4489,, Mei 2018.
- [5] Dian K, Agung N. Jati dan Asep Mulyana, "Perancangan dan Implementasi Sistem Monitor Cuaca Menggunakan Mikrokontroler Sebagai Pendukung Sistem Peringatan Banjir," *eProceeding of Engineering*, vol. 3, no. 1, 2016.
- [6] M. Nazir, *Metode Penelitian*, Bogor, Indonesia: Ghalia, 2013.
- [7] A. Soetopo, *Mengenal Lebih Dekat Wisata Alam Indonesia*, Jakarta: Paco Minat Baca, 2011.
- [8] W. Komputer, *Panduan Belajar MySQL Database Server*, Jakarta: Media Kita, 2010.
- [9] R. R. Hardani dan Sarwosri, "Rancang Bangun Aplikasi Perangkat Bergerak berbagi Foto Berbasis Android menggunakan API Facebook, Flickr dan Picasa," *Jurnal Teknik Pomits*, vol. 1, no. 1, pp. 1-2, 2012.
- [10] B. Smith, *Beginning JSON*, New York: Apress, 2015, New York: Apress, 2015.
- [11] A. Tanoe, *Berkenalan Dengan GPS*, Jakarta: Pohon Cahaya, 2011.
- [12] A. Fauzi, "Penerapan Location Based Service Pada Layanan Informasi Budaya Indonesia Di Perangkat Mobile," *Jurnal Factor Exacta*, vol. 8, no. 3, pp. 251-252, 2015.
- [13] K. Wibowo, "Analisa Konsep Object Oriented Programming Pada Bahasa Pemrograman PHP," *Jurnal Khatulistiwa Informatika*, vol. 3, no. 2, pp. 151-152, 2015.
- [14] Alfa Satyaputra, M. Sc. dan Eva M. Aritonang, S.Kom, *Let's Build Your Android App with Android Studio*, Jakarta: Gramedia, 2016.
- [15] M. Arman, "Anlisa Kinerja Web Server E-learning Menggunakan Apache Benchmark dan Httperf," *Jurnal Integrasi*, vol. 8, no. 2, pp. 93-94, 2016.