

# Implementation of Mobile-D Method for Rest API: Mobile-based Search Application for Tourist Attractions in Klaten Regency

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## ABSTRACT

Tourism development in Indonesia is still very low. There are still many regions that have not been able to develop their regional wealth into tourist attractions. In Klaten Regency, tourism development carried out by the management is clearly not optimal compared to the development of tourism development in other areas. When wanting to visit a place, visitors are required to search the internet. This is effective, but sometimes the information obtained can be wrong, or misleading because it takes the wrong path to the tourist attractions to be visited.. In other words, this will hamper or trouble people who are looking for tourist attractions in an area in Klaten district. In this research, the author uses Android Studio Dolphin with version 3.1. with Java programming language and implementing the Location Based Service (LBS) method which is used to navigate to tourist locations in Klaten district which are displayed on a map in the form of location point markers. Where the data coordinate data of each facility has been entered, the full information of each tourism facility tourism. Based on the results of the design and implementation of a tourist spot search system using the Rest API method in Klaten district based on android

## General Terms

Android, Google Maps, Tourism, Klaten

## Keywords

REST API, Location Based Service, Mobile Application

## 1. INTRODUCTION

Scientific and technological innovation has become the core content of national development layout, among which technological innovation occupies an important position [1]. This digital-dependent paradigm emerged as a result of the complexity of all aspects of life that demand all processes to be fast, precise, accurate, effective and efficient. Technological developments can support regional tourism development. Travelers need to get relevant content from a large amount of network information. The problem of tourist information overload caused by the network sharing mechanism and the various constraints that need to be considered in the itinerary make tourists spend a lot of energy in screening the appropriate tourist services [2]. With the development of the system, it is expected to encourage the development of the tourism system in the region.

Tourism, as an economic activity, can provide added value to the development and differentiation of the offer of other economic sectors [3]. The tourism industry has been affected by new advances in Information and Communication Technologies (ICTs) over the last few years [4]. Technological

development has promoted that tourism is now perceived as a product rather than a service [5].

System development using Rest API implementation and several programming languages. In the tourism field, the adoption of the LBS depends on the social and environmental benefits obtained by the downloaded app [6]. Mobile-based applications that will be applied to Android-based operating systems, which are operating systems that are experiencing rapid development. Many users can use this application on smartphones based on the Android system. The results of this research are expected to help the government in providing tourist location information easily and quickly.

## 2. RESEARCH METHOD

This research was conducted with the aim of answering two main problems. First, the existence of tourist attractions that are still not recognized by tourists from outside the region and abroad. Second, the impact of the decline in the number of visitors to tourist attractions due to the Covid-19 pandemic, both in Klaten Regency and throughout Indonesia and the world. This has a significant impact on the revenue generated by the tourism sector.



Fig. 1 Architecture Diagram

Therefore, this application aims to provide assistance to tourists in finding tourist attractions and serves as a means of promotion for tourist attractions that are less known by tourists from outside the region.

### 2.1 Data Collection Procedure

Data was obtained using 3 stages, namely the direct observation stage, the interview stage, and the literature study stage.

### 2.1.1 Direct Observation (Observation)

Data collection is done by conducting direct observations at the Klaten Regency.

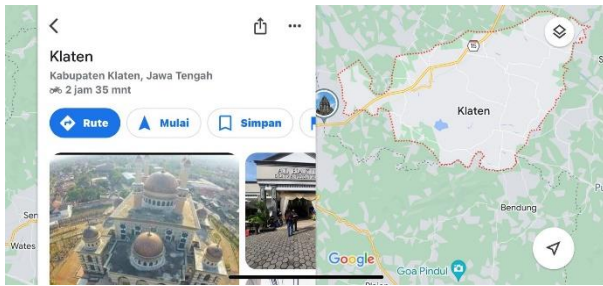


Fig. 2 Klaten Regency

### 2.1.2 Interview

The data collection process is done through interviews with several people who have visited tourism in Klaten.

### 2.1.3 Literature Study

To collect data through literature studies, researchers conducted research on relevant scientific journals, theses, and relevant practicum reports.

## 2.2 System Design Logic

In order to improve the application adaptability of the existing configuration software, firstly, the overall architecture and visual operation interface design of the logic configuration platform [7] are proposed. Almost all of these works need a semantically analyzable model to represent the software architecture design, e.g., a UML class diagram [8]. Logical planning contains system design using UML diagrams, which consist of Use Case diagrams and Flow Diagrams.

### 2.2.1 Use Case Diagram

Use Case Diagram is a UML diagram model that is used to describe the expected functional requirements of a system. This application can search for tourist destination routes based on the tours that have been selected by the user.

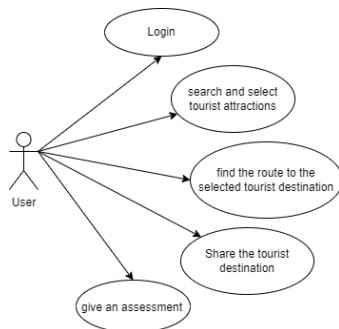


Fig. 3 Use Case Diagram

### 2.2.2 Flowchart

Reversible flowcharts are intended as a model of reversible programming languages in much the same way that classic flowcharts are a model of many widely used programming languages [9].

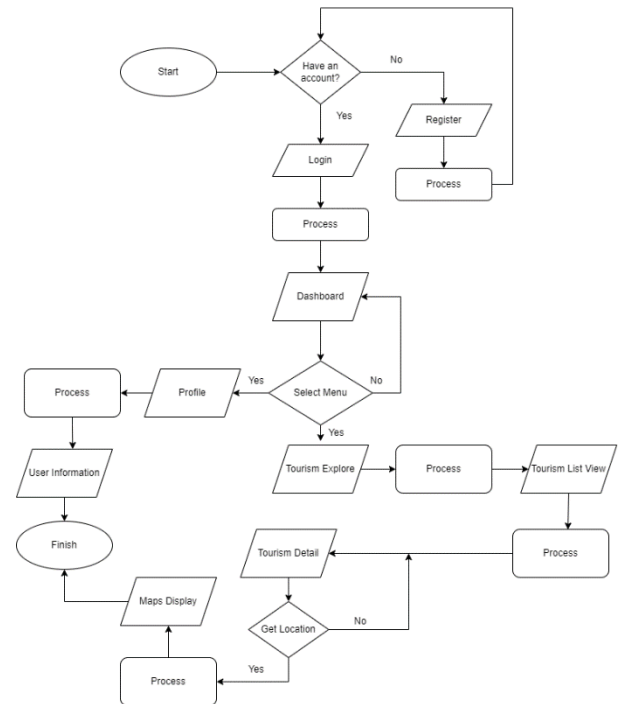


Fig. 4 Flowchart

## 2.3 Physical Design

### 2.3.1 Entity Relationship Diagram (ERD)

At this stage ERD is used to describe the relationship between entities contained in the application to be made. This travel search application has entities that are interconnected or related. The user entity has a one-to-many relationship with the tourist data entity.

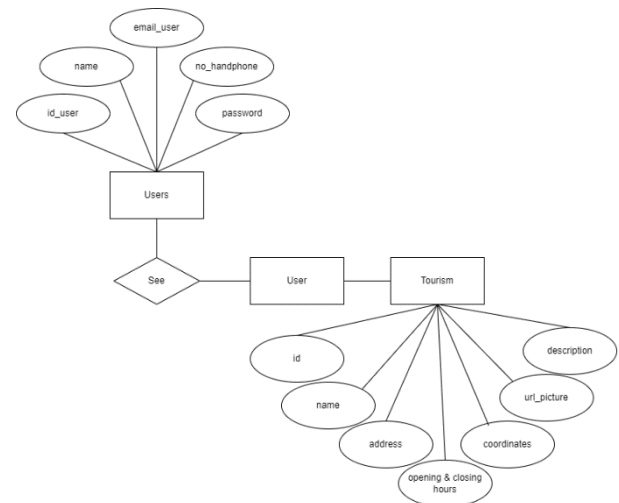


Fig. 5 Entity Relationship Diagram

### 2.3.2 Table Relation

System development using MySQL and Firebase as a database. There is a table relationship between 2 different but interrelated databases, namely user data in the Firebase database is used to access tourism data contained in the tourism database table.. MySQL is a relational database server that supports the well-known SQL (Structured Query Language) database language [10]. Table design is used to determine table structures such as fields, data types, field lengths, and field descriptions. This

structure will be used in creating the database. While Google's Firebase database is utilized for the real-time exchange of data between the server and mobile application [11].

**Table 1. Tourist Database**

No	Field	Data Type
1.	id*	Int
2.	name	Varchar
3.	address	Varchar
4.	openingnclosinghours	Varchar
5.	ccordinates	Varchar
6.	url_pictures	Varchar
7.	description	Varchar

Tourist database to store data related to tourist attractions data that will be used in the application, where id is the primary key.

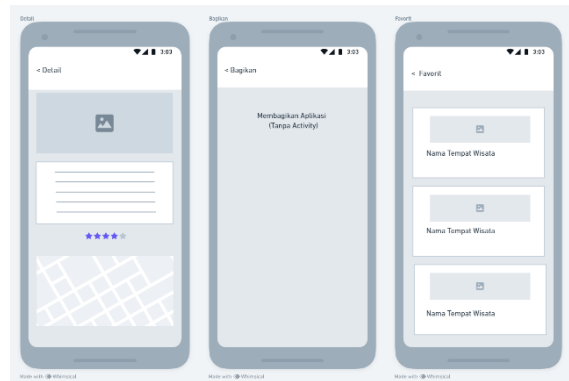
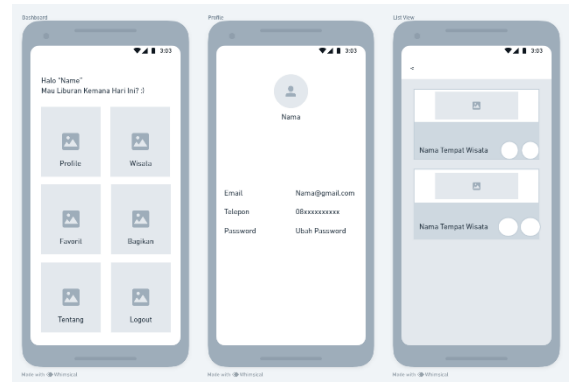
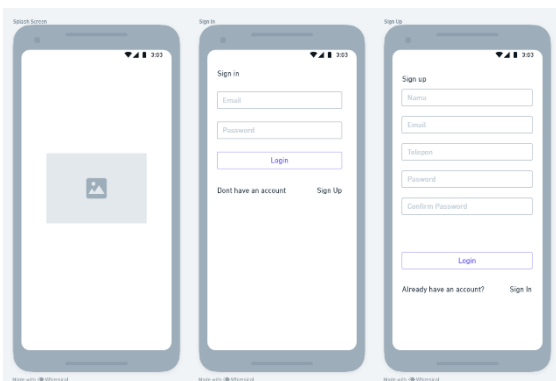
Identifier	Providers	Created	Signed In	User UID
admin@gmail.com		Jun 8, 2023	Jun 13, 2023	o3AHxHxGK0W9f6WstBx3Goc38Y22
ivan1@gmail.com		Apr 5, 2023	Jun 7, 2023	ik0NuAM055CXFPDnu0oghSAS3VYj1

**Fig. 6 Firebase Authentication Database**

The user database uses Firebase as a database to store user data related to the user such as name, email, and mobile number, with the id of each user as the primary key.

## 2.4 Interface Design

The application design process goes through several stages, one of which is the interface design process. To articulate the conceptual design idea, the interface designers first sketch out the initial ideas on paper form with wireframe [12]. Wireframes are created using whimsical which can be accessed for free. This wireframe explains the outline of the application design, from content to layout.



**Fig. 7 Interface Design**

## 3. RESULT AND DISCUSSION

### 3.1 Assumptions

This application can be operated using android. Through this application, people can easily find tourist attractions in Klaten. the application of Location Based Service method is expected to deliver visitors to the intended tourist attractions. So that the government can increase its regional income along with the development of its tourist attractions.

### 3.2 Hypothesis

This hypothesis is based on assumptions obtained and proven in the research stage. This research hypothesizes that "The Tourist Attraction Application can make it easier for visitors to find tourist attractions in the Klaten area, and can assist the government in increasing regional income through tourism optimally".

### 3.3 Feature

There are several features in the application. the application of location based service technology can also be found on the tourism details page.

**Table 2. Feature**

No	Menu	Feature
1	Splash Screen	displays the app logo as the opener
2	Login & Register	account creation by entering personal data
3	Dashboard	displays several menus
4	Profile	contains personal data of the account owner
5	Tourism Destination	displays some recommended tourist areas
6	Tourism Detail	describes attractions and displays tourist ratings and locations.
7	About Page	displays information about the app creator

### 3.4 Run an Experiment

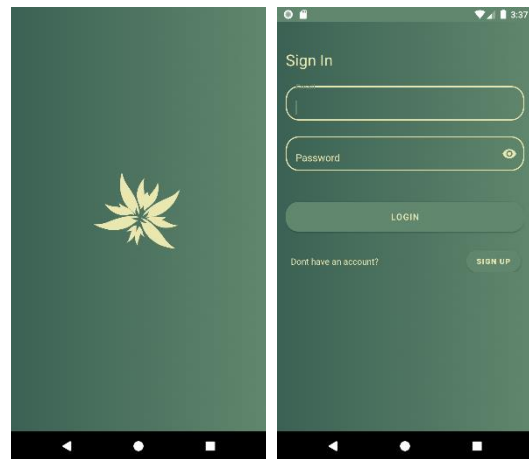
After the wireframe is successfully created, the next step is to do the coding. Program representation is an important field in the program analysis research area, and it is at the base of most program analysis and transformation techniques [13]. This system development uses the java programming language with the application of the Location Based Service method. Location-based service (LBS) has been used in many fields, such as military, medical treatment, emergency rescue, etc., due to the rapid popularity of mobile devices [14]. Databases can be connected because of the Rest API implementation.

### 3.5 Implementations

Smartphones are becoming increasingly widespread around the globe and are ever more accessible to everyone, including older adults, who are traditionally seen as experiencing difficulties in interacting with information and communication technologies [15]. Based on the system design that has been made, the following are the results of the system implementation after coding.

#### 3.5.1 Splash Screen & Login Page

The Splash Screen page will appear when the application is opened where a splash screen will appear in the form of logo animation and different background colors.

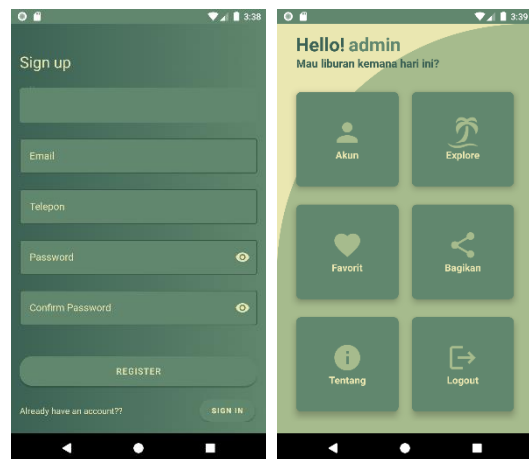


**Fig. 8 Splash Screen & Login Page**

On the Login page there is a form as a place to fill in the user's email and password, to be able to access the application.

#### 3.5.2 Register Page & Dashboard Page

The Register page contains a form that users can use to register a new account to access the application.



**Fig. 9 Register Page & Dashboard Page**

The Dashboard page is a page that displays other menus, and there is also a log out menu, which functions when the user wants to log out of the account.

#### 3.5.3 Profile Page & Tourism Page

The Profile page will display user information such as, name, email and phone number. There is also a password change feature if users wish to change their account password.

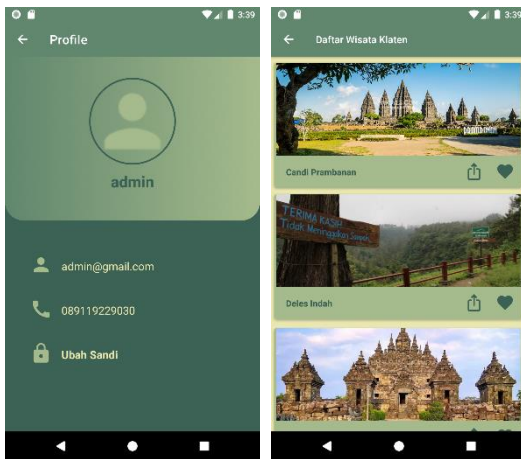


Fig. 10 Profile Page & Tourism Page

The Tourist List page will display tours in the form of a list.

### 3.5.4 Tourism Page Detail

The Tourist Detail page will display details of each tour, the data displayed such as the name of the tourist attractions, the address of the tourist attractions, the operating hours of the tourist attractions, as well as the coordinates and maps of the tourist attractions.

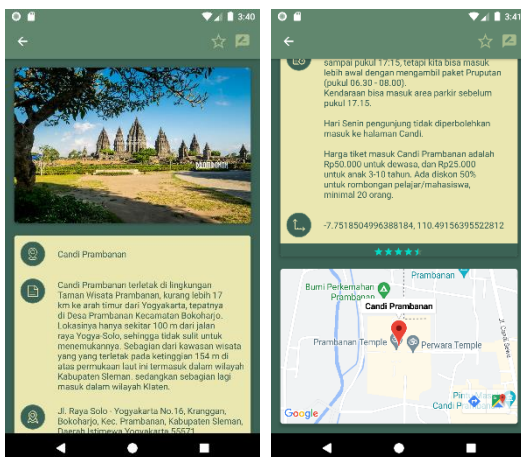


Fig. 11 Tourism Page Detail

### 3.5.5 About Page

The About page will display information about the application and NIM application creator.



Fig. 12 About Page

## 3.6 Discussion of Result

The main test of this program uses an android emulator from Android Studio. In addition, testing on this program was tested on other android devices used by the community. Therefore, the efficiency of software testing needs to be improved in order to ensure the appropriate delivery deadline and cost of software development [16]. On the other hand, black box testing is based on a specification that describes the behavior and operating conditions of Application Under Test (AUT).

Table 3. Black Box Testing

No	Process Name	Result	Desc.
1	Splash Screen	Displays the start page when opening the application	Success
2	Profile Page	Display user data	Success
3	Tourism Page	Display the list of tours	Success
4	Tourism Page Detail	Display detailed information related to the tour selected by the user	Success
5	Map feature on the menu tour details menu	Display the map according to traveler coordinates	Success
6	Logout Menu	Remove/disconnect user access to the application	Success

The results of implementation and testing of this application aim to find out the errors and deficiencies that exist in the program, in addition to ensuring the system runs according to the previous plan. the results of testing and implementation can present an analysis of the system design. In the mobile-based Klaten Regency tourist spot search application, every button and menu available is successfully executed.

From these results, it can be concluded that all features on the system can be run. A total of 6/6 of all test parameters have "Successful" results.

## 4. CONCLUSION

Based on the output that has been generated, it can be concluded as follows :

1. This Mobile-Based Klaten Regency Tourist Attraction Search Application is successfully run with the java programming language.
2. This Mobile-Based Klaten Regency Tourist Attraction Search Application successfully displays a map according to the coordinates of each tourist spot.
3. This Mobile-Based Klaten Regency Tourist Attraction Search Application is expected to help make it easier for people and tourists who want to visit and find any tourist attractions in Klaten Regency.

This system succeeded in becoming a mobile application by applying information technology that can facilitate tourists in finding information about tourist attractions in Klaten Regency.

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