# Finding a Walking Mate and Tracking Diary: 'Working Mate' *

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**Abstract.** In this project, the mobile application "Walking Mate" provides a place for modern people to find walking mates, and it is intended to help them to have meaningful walking by leaving a record of walking. The main users of the application are those in their 20s and 30s who enjoy walking. It is a mobile application available on Android smartphones that can easily access users' daily lives anytime, anywhere.

This paper is written for functional description of the application 'Walking Mate' with the main function of the walking mate finding and path tracking diary, and description of the technology to be used. In the first section, it includes the background and the importance of the application. In addition, compared to existing services, it introduces what differentiation it has and what limitations it has.

**Keywords:** walking · mate · Track the road · application.

## 1 Introduction

### 1.1 Background

At this time when restrictions due to Corona have been relaxed to some extent, many people are planning or going on a trip. And many people travel to a specific city by vehicle or plane, but when they arrive in the city, many people walk around. Most of the trips are planned with family or acquaintances, but there are also cases where they travel alone. And sometimes I can't remember which city I've been on, which road I've taken, or what kind of photos I've taken.

In addition, Some people also like to walk around the neighborhood they live in. Some people who like this activity prefer to go together rather than alone, but there are those who find it difficult to travel with acquaintances or family members.

The solution proposed by the project is as follows.

* Supported by organization x.

1. Use the system to find a mate to go with.
2. Information to decide who one wants to be is not expressed only in words, but the departure location of the person going with you and age, gender, reliability, etc. of personal information should be expressed on the map.
3. When looking for a mate, it is a good idea to choose a place and distance to walk.

### 1.2 Project's Goal

The goal of this project is to enable people to safely meet their mates with a clear common purpose of "walking".

In the case of existing applications that look for local people, most of them turn into dating apps over time, even if their original purpose was not. We have thought of several functions to prevent this deterioration. First, sanctions are imposed on users who approach with different purposes through the reporting function. Second, the filtering function is actively used to make it easier for users who only want to take a walk to find a mate. This filtering function is used not only to select the pin you want to see, but also to decide who you don't want to show your pin to. Through this, users can block access from people they don't want to walk with. Finally, there are reliability and title functions. After walking, users can evaluate their mates. This evaluation is converted to reliability, and the reliability of all users is always open. It is also expected that it will be possible to prevent a lot of abnormal behavior of users as they can significantly lose reliability with just one sanction. Users who have been consistently good at walking can achieve the challenge, and each time they achieve the challenge, a corresponding title is given. Since this title is also always open, the title itself can secure some reliability with other users.

In the case of walking tours, there are already many applications for mate-seeking, but our application will narrow the scope so that people can find people who meet their purpose more easily. Usually, most of the trips are by public transportation or by driving. In the case of a walking trip, it is difficult to find a suitable travel mate because not only the number of people is small, but the departure point and distance are also very important. Our project focuses solely on walking and tries to solve these problems. When posting on the travel mate bulletin board, the publisher must specify the departure point and destination. This distance is automatically calculated and classified into short, medium, and long distances according to the criteria specified by the application. All posts have this distance and departure area attached to the subject. Since the categorization is set in all writings, it is easy to go through filtering based on this. In other words, users can quickly search for posts with travel schedules that fit them.

# 2 Proposal

## 2.1 Related Work

The first goal of the project was to "recommend a travel course and find a travel mate,". But the topic was changed because it was difficult to find differentiation due to the large number of similar existing applications, and it could not surpass the completeness of the application.

**Table 1.** Features per each application.

| Application | Application topic | Finding mate | Diary | Challenge | Filtering search | User evaluation |
|---|---|---|---|---|---|---|
| Travel Us | travel mate | O | O | O | X | X |
| Trip Soda | travel mate | O | O | O | X | X |
| Triple | reservation, planning, record | X | X | X | O | X |
| Sango Mate | tracking record, mate | O | O | X | O | O |
| Walking Mate | mate, diary | O | O | O | O | O |

The following is a table comparing functions in applications with similar topics. Travel Us and Trip Soda have the function of finding mates, but there is a difference in that mates are limited to travel. In the case of 'Triple', there is a travel record function, but the focus is on travel plans rather than records. "Sango Mate" has the most similar function to "Walking Mate", and the difference can be found in that the application focuses on hiking and does not include challenge functions.

## 2.2 Problem & Solution

The problems found while devising the function of the app are as follows.

1. There is a risk of unfamiliar encounters. - Application provides reporting function and user rating function, and user writes the starting point, not user's current location, on the post. In case of spying on or exploiting other promises, the post is only floated if the conditions of the person who posted the post and the person who reads the post are matched.
2. If the appointment continues to fail, user may be disappointed with the application. - The application applies sanctions on the provider of the cause of cancellation. If the user cancels the appointment three times, the use of the application is restricted.
3. Only movements that you want to leave on the record should be tracked, not all movements. - Create a button indicating the start and end of tracking, and provide a button widget to eliminate the inconvenience of pressing the button.

### 2.3 Features

**Finding Walking Mate** provides a community. Since the purpose of the community is to meet stranger in person, the minimum personal information, age group and gender, is disclosed. (User must authenticate yourself when you sign up for the application.) User can search for posts through filtering within the community. It also provides an appointment fix function, which means that an agreement has been reached. To prevent repetitive cancellation or abandonment, it provides a reporting function, a user evaluation function (providing questions for evaluation), and limits the use of the application for more than three cancellations.

The community provided by the application is divided into two branches.

1. Travel Mate Bulletin - A bulletin board to find a mate to go on a walking trip before or during a trip. The form of the bulletin board will be designed similar to the carrot market, and it will communicate in the form of messages rather than comments.The posts here include a starting location, a starting time, an estimated travel distance ( 10km/10km/30km ), and an estimated travel route.
2. Walk Mate Bulletin - A bulletin board for finding a walk mate in the neighborhood. This board consists of a form in which a ping is stamped on the origin of the post on the map. When the user touches the ping, the content of the post, the exact departure point, departure time, and expected travel time, can be viewed.

**Load Tracking Diary** is a function that allows user to record walking paths and somethings else. There is a button which is Pressed to start tracking the travel path and finish tracking. User can leave writings and photographs, feelings on the road, weather, and reviews of places visited. Records can be kept private, written like a diary, or shared with other users by disclosure.

**Challenge** function was added as an element for the user to have small fun using the application. If a certain number is achieved by the steps, appointments, ratings, and records, the title will be unlocked as a reward, and the title used will allow each other to determine whether they are safe users.

### 2.4 Technique

The project uses Android Studio IDE (Integrated Development Environment) to create Android apps. The main development language is JAVA and, application will use Naver Map API, pedometer function, Firebase, and Pigma to implement detailed application functions.

**Pigma** is a design tool used to create UI/UX designs or design systems. The main functions of Pigma are as follows.

- It provides an UI drawing function that can make high-quality UI components into one tool for free, and can be applied to desired purposes such as presentation, animation, brainstorming, emoji, and simple game production.
- It can be easily shared through web links so that designers and planners can work together
- Systematic use of the tool itself is possible, such as easy copy/paste, development of its own plug-in, and API provided. [1]

Pigma will be used for UI design of our application, and based on this design, we plan to start developing front-end.

**Naver Map API** provides various services such as Web Dynamic Map, Mobile Dynamic Map, Static Map, and Directions for free. (Paid for more than a certain amount of use) This application will be used to represent the origin or route of travel mate posts on the map-type, walk mate bulletin board, and to track and record the route of the trail diary. [2]

On the bulletin board, application ping the map through a marker to display the location, and display information in text under the marker with a caption.

The way to track the road is as follows.

1. Use the location tracking mode to receive the user's coordinates in real time. The getLatitude(), getLongitude() method is used to receive user latitude and longitude coordinates.
2. When changing the user's location, registering OnLocationChangeListener with the addOnLocationChangeListener() method allows developers to receive events about location changes.
3. Draw a path line using the received latitude and longitude coordinate data.

**Firebase** is a mobile application development platform owned by Google. It can develop apps regardless of the operating system, and informs users of the number of uses, advertising effects, and frequency of problems so that developers can easily use it. The development functions of the Firebase are largely as follows.

- The authentication function: A function that helps users to log in and sign up for membership more easily and conveniently through a service that supports SSO[5] using the Firebase.

[5] It is an authentication method that allows you to access multiple apps with just one authentication procedure. When using SSO, a number of services are available under one account.

- Real-time database: a function that saves data in JSON form in NOSQL[6] cloud database and synchronizes it to clients in real-time. (There is also a new version of the database called Cloud Firestore.)
- Hosting[7]: it hosts static content such as HTML, CSS, JavaScript, etc. quickly and securely. [3]

Through this Firebase, we will manage the database of membership and community posts.

**Pace Counters** By adding permission to use Android sensors in Android studios, the number of steps is measured using a built-in foot sensor within the device.

## 3 Planning

This project is a total of 15 weeks, and for future development, the implementation must be completed for a total of 8 weeks from Week 6 to Week 13.

The development plan is as follows.

**Table 2.** A table of development schedules

| | |
|---|---|
| week 6 | UI design complete, map api application attempt, social login check |
| week 7 8 | Completed the interaction function using markers and captions by applying map api |
| week 9 | Enables automatic display of posts that meet user distance and search criteria |
| week 10 11 | Implementation of diary decoration, disclosure/private/specific person disclosure |
| week 12 | Establishment of challenge and reliability calculation system |
| week 13 14 | Testing + Debugging |

### 3.1 Limits

Regarding the risk of meeting strangers, we were concerned that adding any function could not prevent all accidents, but we decided to put off considering the possibility and risk of application degradation by focusing on the function to be provided by the working mate.

[6] Not Only Sql: A term used to describe high-performance, non-relational databases, rather than relational databases in RDBMS form. It is characterized by ease of deployment, scalability, high availability, and excellent resiliency.

[7] It is a service that rents space on the Internet, and even without directly building a web server, it can rent some space on the server and have the same effect as having an independent server.

In the walking mate bulletin board, the function of displaying only posts within a certain distance from the user's location is implemented in the form of a user selecting a neighborhood.

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