

Optimized Travel Planner

Mahima Phalkey¹, Yash Rahate², Yogesh Warathe³, Shantanu Pradhan⁴, Ayush Bharadwaj⁵
Prof. Ashwin Shinde⁶

^{1,2,3,4,5,6}Department of Computer Science and Engineering, DBACER, Wanadongri, Hingna Road-441110, Nagpur

Abstract - Optimized travel planner (OTP) as per the name indicated it smartly makes its way in analyzing user's likes and dislikes and the time period the user is willing to explore a place and gives him with amazing results in the form of multiple paths to utilize the time. This System is basically used to help a traveller new to the city or anyone who wants to explore a city in the given time period, the system makes use of the Google places API to get all the locations and places with all their information to sort and place it before the user in the paths to make his choice. The Places are sorted and selected based on the top rankings by the foursquare. During the user Registration the user is asked some questions helping them to filter out in searching the places, the places are displayed on the maps giving a clear idea of the location and giving the paths from one place to another from the start location to the end location. If the time specified by the user exceeds 8 hours i.e. between 9 am to 7 pm the system also asks you whether you want to visit an adventure or water park and will show u options based on the rankings and reviews about it. The Traveler may be new to the city, not knowing about city, in the map view he can see the ratings and reviews which are recorded from the G-Maps itself. The frontend of the System Uses Flutter while Firebase as the Backend (Online services), and Dart as Programming language.

Key Words: Traveler, Route Planner, Google Maps API, Firebase, Planning.

1. INTRODUCTION

The Android Smart City Traveler as the Name indicates, smartly makes it way in analyzing user's likes and dislikes and the time period the user is willing to explore the place and gives them three different paths in maps from where user can select a particular path to utilize the time. This System is basically used to help a traveller new to the city or anyone who wants to explore the city according to there convenience.

2. BACKGROUND

At present, in general tourists and travelers waste a lot of time planning and deciding their trips. In this context, this application aims to identify the main need to support the traveler to improve the tourist point of promotion, by the use of easy to use mobile application proposal. Normally, most of the travelers like to visit the famous places, spots, sightseeing, as well as local charms of that places. To achieve this, our proposed system that can automatically show a travel route and plan for the user. It helps a traveler

new to the city or any one who wants to explore the city within a specific time period. The user is supposed to enter their interest and preference while login in. after, the user can choose the location manually or let the system detect its current location. Then, they have to enter the time, that is the start and end time, also the person can choose the date, if suppose the user wants a plan for day after or any other day.

Now the application will smartly make it way in analyzing user's interest and preferences and the time period user is willing to explore and design a route with the best tourist spot around the selected location. The system makes use of Google Maps API to get all the places around the selected location with all the information. All the locations are then sorted on the basis of ratings, distance and various other constrains, before placing it to the user.

3. GOOGLE MAPS API:

Google maps API allows maps to be added based on google maps data to an application. The API itself handles access to google maps servers, data downloading, map display and respond to map gestures. API calls can be used to add markers and overlay to a basic map, it will improve user interaction with the map. The API allows to build location aware apps for the local places nearby.

4. FIREBASE:

The fire base is mobile and web development application development platform developed by firebase Inc in 2011, it was then acquired by google in 2014. Firebase provides services such as real time database and backend. The services provide application developers an API that allows applications data to be synchronized across client and stored on firebase's cloud.

Firestore is easy to use and it doesn't contain tables or support queries hence providing an advantage over traditional relational database, also it is real time so as soon as a change is made to the data (a new comment is added for example), all connected clients will immediately be updated.

5. AIM AND OBJECTIVE:

Aim: To develop an android application that analyzes user's likes, dislikes and time period that user is willing to put in to explore a place and give an optimized result.

Objective: This application can be used by a traveler who is new to the city or anyone who wants to explore a city in a bounded time period, so the person has to do minimum travelling and can make use of time wisely.

6. MOTIVATION:

This system can be used to by any Company or Institution related to tourism which may help their clients or agents to help the users in gaining an advantage over a Paper Based Map. The Places are sorted and selected based on the top rakings by the foursquare. During the user login the user is asked some questions helping them to filter out in searching the places, the places are displayed on the maps giving a clear idea of the location and giving the paths from one place to another from the start location to the end location. The Time shouldn't exceed 22 hours and the travel plan u chooses is saved only for a single day. If the time specified by the user exceeds 8 hours for example, between 9am to 7 pm the system also asks u whether u wants to visit an adventure or water park and will show u options based on the rankings and reviews about it. Since the Traveler may be new to the city not knowing any theplace, in the map view can show the ratings and reviews of the particular place. The user gets the whole view of the plan at once, with most accuracy. All as the locations are viewed in maps the user can zoom in and zoom out for the better view.

The usage of this application will greatly reduce the time required to search for places and get reviews and rating of each and every one, but using this app. Makes it simpler with quicker decision-making ability.

7. REVIEW OF LITERATURE

[1] Andrea Rossi, Joshua Cooper, Andrea Rossi, Dimosthenis Kyriazis, Theodora Varvarigou - "Sustainable smart city applications", 2009

Two innovative smart city IoT applications: the first one refers to heat and energy management utilizing different resources in order to optimize use of energy in commercial and residential areas. The second application refers to cruise control for public transportation utilizing different resources in order to provide driving recommendations that aim at eco efficiency.

[2] U. Gretzel, "Intelligent systems in tourism: A social science perspective. Annals of Tourism Research", vol. 38, no. 3, pp. 757-779, 2011.

Smart describes the increasing reliance of tourism destinations, their industries and their tourists on emerging forms of ICT that allow for massive amounts of data to be transformed into value propositions. The paper defines smart tourism, sheds light on current smart tourism trends, and then lays out its technological and business foundations. This is followed by the discussion on the prospects and drawbacks of smart tourism.

Harrison et al. (2010) conceptualize smart as exploiting operational, near-real-time real-world data, integrating and sharing data, and using complex analytics, modelling, optimization and visualization to make better operational decisions. The term has been added to cities to describe efforts aimed at using technologies innovatively to achieve resource optimization, effective and fair governance, sustainability and quality of life.

8. WORK DONE /PROPOSED SYSTEMS

8.1 Proposed Approach

This is an android application. More than one app is been developed of our project title but they used Android Studio and we are using Flutter for designing our UI. The previous applications were having a lot of problems on optimizations of the path. The inspiration behind choosing this topic was a project named Android Smart City where the application of that android application was this system can be used by any Company or Institution related to tourism which may help their clients or agents to help the users in gaining advantage over a Paper Based Map. We are using that idea with some changes in it.

In our application we are using flutter for making basic UI and for Database connectivity we are using Firebase to store our data.

8.1.1 FLUTTER

Flutter is an app SDK for building high-performance, high-fidelity apps for iOS, Android, and web from a single codebase. The goal is to enable developers to deliver high-performance apps that feel natural on different platforms. We embrace differences in scrolling behaviour, typography, icons, and more.

No mobile development experience is required to get started. Apps are written in 'Dart', which looks familiar if you've used a language like Java or JavaScript. Experience with object-oriented languages is definitely helpful, but even non-programmers have made Flutter apps!

8.1.2 WHY USE FLUTTER?

- Be highly productive
 - Develop for iOS and Android from a single codebase
 - Do more with less code, even on a single OS, with a modern, expressive language and a declarative approach
 - Prototype and iterate easily
 - Experiment by changing code and reloading as your app runs.

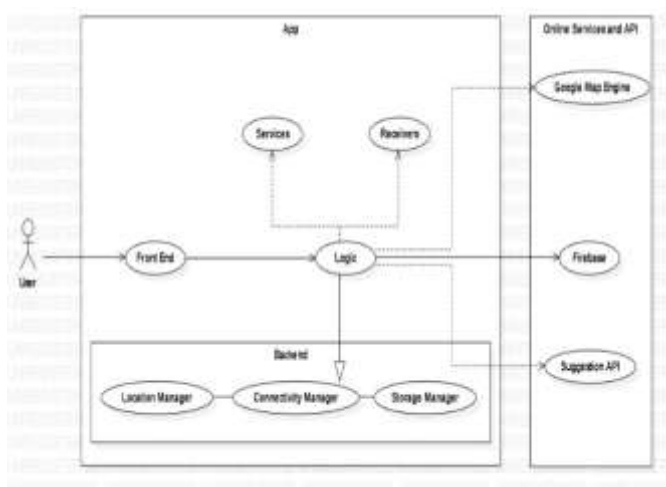
- Fix crashes and continue debugging from where the app left off.
- Create beautiful, highly-customized user experiences
 - Benefit from a rich set of Material Design and Cupertino widgets built using Flutter's own framework.
 - Realize custom, beautiful, brand-driven designs, without the limitations of OEM widget sets.

8.1.3 FLUTTER OVERVIEW



The upper layers of the framework are used more frequently than the lower layers. For the complete set of libraries that make up the Flutter's layered framework, see our API documentation. The goal of this design is to help you do more with less code.

8.1.5 ARCHITECTURE



USER:

The Person who interacts with the Application to obtain a travel plan for the day or more.

FRONT END:

This is the User interface. It interacts with the User as well as the application backend to display routes, options, and makes changes to the displayed output accordingly

LOGIC:

This is the actual part of the program where all the decisions based on the user input, along with backend services are taken into consideration which will affect the actual output to be displayed to the user.

SERVICES:

All of the application's background activities are called as services. This includes fetching data from the server, calculation of approximate distances, shortest route calculation, all of which will be provided by the server.

RECEIVERS:

LOCATION MANAGER:

This is a Service, which is responsible for getting user's Current location, as well as displaying nearby available facilities accordingly.

STORAGE MANAGER:

This application does not require constant Internet connection. In order to store plans for the upcoming days, this permission is needed in order to store data locally.

CONNECTIVITY MANAGER:

Class that answers queries about the state of network connectivity. It also notifies applications when network connectivity changes.

9. DESIGN AND IMPLEMENTATION STRATEGY

9.1 MODULES

The Android/IOS application which we will going to create is Optimized Travel Planner (OTP). Which helps tourist's to explore new places to explore food, hotels near to them by simply accessing this Android/IOS app.

This Android/ IOS app is implemented in some modules as mentioned below:

1) Login/Register:

This is the first module of Optimized Travel Planner application in this, if in case user have to use this app then it is mandatory step to register on to this app only

authorized person is able to access this app's functionality and services.

If new user wants access this app then the first step is to register onto it, if user don't have any registered account then user can register on it through verified google account, in case if user don't have any google account then one can simply create it by clicking on register option showed in screen shot below.



LOGIN/REGISTER MODULE

Once user done with the registration phase the data of that user is stored in a database for further authentication process or to provide access to only authorized person.

After the completion of registration process, now user can simply login to the app by clicking Sign In option, and by providing authorized google verified id.

2) User Choices:

Next phase is implemented by the collection choices and the various likes from the user, once user logged in successfully then user have to select choices according users

Likes and dislikes as shown in below screenshot.

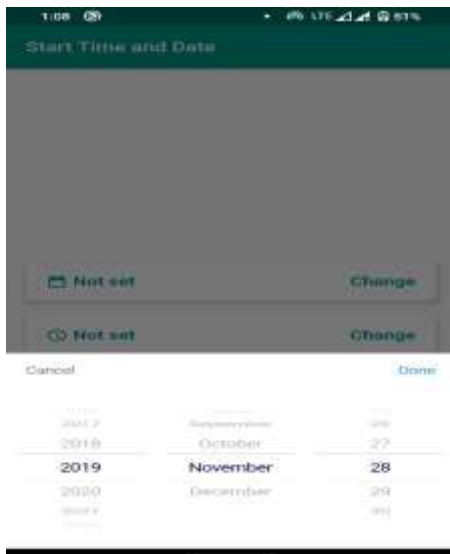


USER LIKES/CHOICES

Once user done with selection of choices, the system will stores all the choices to the database for further use, and suggest the various options to the user on the basis of likes and dislikes of the user in case if the likes of user is not present in a given list then user can add it manually for the better result.

3) **Select Time and Date:** In this phase user have select appropriate time and date, on the basis of that system will gives the appropriate resulting output.





Time and Date Setting

After specifying likes and dislikes, user have to specify the date and the time to the app so that the app will analyse all the data given by user and according to it app provide them an optimized travel plan in the form of google map for the selected time and date on the basis of efficient route and resources .

Once the user done with selection of likes and dislikes, selection of time and date, all the data is then stored in a centralized database in a proper format and once the user completed with all these basic steps the app will provide the schedule of entire day to the user on the basis of machine learning algorithm and app also provide map facility to the user with optimized route



10. CONCLUSION

Most people without using the latest technology waste a lot of time just planning their trips. So, an application like Optimized Travel Planner really helps tourists to utilize their precious time to the fullest and also enjoy their trip at the same time.

11. REFERENCES

- [1] Zhu Wanchun, "A Kind of Self-Help Guide System for Mobile Platform", Intelligent Transportation Big Data & Smart City (ICITBS) 2016 International Conference on, pp. 393-396, 2016.
- [2] Vineet Singh, Akeshnil Bali, Avinesh Adhikthikar, Rohitash Chandra, "Web and mobile based tourist travel guide system for fiji's tourism industry", Computer Science and Engineering (APWC on CSE) 2014 Asia-Pacific World Congress on, pp. 1-7, 2014.
- [3] V.N. Sastry, T.N. Janakiraman, S.I. Mohideen, "New algorithms for multi objective shortest path problem", Opsearch, vol. 40, pp. 278-298, 2003.
- [4] F.B. Zhan, C. Noon, "Shortest Path Algorithms: An Evaluation Using Real Road Networks", Transportation Science, vol. 32, no. 1, pp. 65-73, November 1996.
- [5] T. Angskun, J. Angskun, "A travel planning optimization under energy and time constraints", Int. Conf. Information and Multimedia Technology ICIMT, pp. 131-134, Dec. 2009.

- [6] C. Chung-Hua, H. Chenyang, "A Platform for Travel Planning by using Google Maps", 16th IEEE Int. Conf. Mobile Data Management, vol. 2, pp. 120-125, Jun. 2015.
- [7] D. Gavalas, C. Konstantopoulos, K. Mastakas, G. Pantziou, "Mobile recommender systems in tourism", Journal of Network and Computer Applications, vol. 39, pp. 319-333, 2014.
- [8] D. Gavalas, C. Konstantopoulos, K. Mastakas, G. Pantziou, "A survey on algorithmic approaches for solving tourist trip design problems", Journal of Heuristics, vol. 20, no. 3, pp. 291-328, 2014.
- [9] Indri Hapsari, Isti Surjandari, Komarudin, "Visiting Time Prediction Using Machine Learning Regression Algorithm", Information and Communication Technology (ICoICT) 2018 6th International Conference on, pp. 495-500, 2018.
- [10] Larisa Kuznetsova, Arthur Zhigalov, Natalia Yanishevskaya, Denis Parfenov, Irina Bolodurina, Advances in Intelligent Systems, Computer Science and Digital Economics, vol. 1127, pp. 346, 2020.