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Tour-Easy: ML Integrated Trip Planner and Scheduler App

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***Abstract*— In this modern hi-tech world, it has become a passion and trend to plan for a tour. It would be very helpful for the tourists if there exists a travel assistance app which can assist them to improve and complete their travel experience. Tour-Easy is an ML-Integrated mobile app which aims to give interested results for trip planning, enabling people to enjoy the trip. It is developed using React Native integrated with Google APIs to give a flawless and intuitive platform to plan and organize their journeys. With our app, one can have a smart plan which can save time and extend their travels according to the requirements of destination and time constraints. Through its service APIs, Tour Easy recommends the necessary outputs based on the user's choice. Also, the app uses APIs to recommend nearby hotels. Tour Easy is devoted to furnish a great client experience. It is an user-friendly platform with a well-designed interface which allow users to fluently plan their journey, and discover new places.**

***Index Terms*— ML-Integrated, React Native, trip planning.**

I. Introduction

Now-a-days, in this busy, stressful life, people are very eager and fond of outing for relaxation. Tour Easy is a mobile application designed to help users easily plan and organize trips. The app provides a seamless and intuitive platform for creating personalized travel experiences which is developed using React Native and integrated with Google APIs. Tour-Easy helps in smart trip planning. The application can generate a complete schedule and the precious time of the users can be saved by entering the desired location, start and end time. This allows travelers to get the most out of their trip by visiting destinations that suit their interests and preferences.
Tour-Easy seamlessly integrates with different APIs using various information sources to improve the user experience. Using APIs related to places such as hotels etc., the application provides the best recommendations according to the customer's location. Besides accommodation recommendations, Tour-Easy also provides insight into local dining options. By leveraging restaurant-related APIs, the app can suggest the best places based on the user's location and preferences. Whether it's an upscale cafe, fine dining, or casual restaurant, users can search in Tour-Easy to find the best places to eat on the go. Tour-Easy is dedicated to provide a great customer experience. With our app's well-designed interface and powerful features, users can easily plan trips and discover new places. Whether you're an avid traveler or a first-time explorer, Tour-Easy is your best companion for creating unforgettable and hassle-free travel experiences.

II. Literature Survey

A literature survey is an important evaluation of existing literature in a specific field or area of research. It

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involves gathering and reviewing published research papers, books, articles, and other sources of information to know the current state of knowledge in a specific field. We have surveyed lot of recent research papers with respect to trip planning to build our application, out of which few papers are briefed in this section.

In paper [1], the authors opin that combining the tour guide with the trip planning tool could integrate pre-trip planning with during-trip planning and provide more personalized and relevant information during a trip. In addition, post-trip evaluation can be integrated into the system in which the users will be able to rank the different destinations they have been to. Location and map-based tourist information tools using Google Application Programming Interface (API) opened many opportunities to enhance the research. Further authors have stated that in terms of software implementation, the mobile application is an Android app that encompasses the view of augmented reality, offering the user the ability to choose content in both 2D and 3D. The user's position is discovered through the Global Positioning System (GPS) built into the terminal and the triangulation of phone masts. Considering context-based data and user profiles, the application queries the content server for multimedia items that are location-tagged (categorized by latitude, longitude, and altitude data). According to those sensor readings, the information shown on the screen is dynamically positioned on the screen at the right coordinates. This system is constructed using an engineering framework developed to design and implement an agent-based tool, as well as integrating existing state-of-the-art in order to create an open, flexible, global anticipatory system with mobile access for the promotion and management of inland and cultural tourism which will be user-friendly, cost-effective and secure. The system has been standardized to run on any mobile device and is Interlingua.

A mobile app to solve the issue that almost all tourists face when they plan to travel to a new destination alone is presented by the author in paper [2]. The Amar Bangladesh app assist individuals to discover the closest tourism spot and information related to their plans upon checking in. The idea of Amar Bangladesh app is to get the all the spots in one app and make it lesser deal to move from one spot on to the next. In countries like Bangladesh, Pakistan and Myanmar, people have access to smart phones but people are not completely aware of the technical advancements it carries. This paper is focused on those who are travellers and can take advantage of this advancement to know the nearest tourist spot. By using this app, travellers can easily find the place they want to visit and tourist spot which is nearest from their location. They can deselect attractions which they do not prefer to go. Since the mobile application needs GPS, one need to use built in GPS tracker from Android phone which will track the user's location and then it will check the real time database to find which places are good near user's location and then it will show the nearest tourist spots in detail.

In paper [3], the author defines that machine learning techniques are becoming crucial in the field of personalized travel planning, as they can help to generate recommendations for individuals based on their unique preferences. In this review, they examine the current state of machine learning techniques for personalized travel planning, highlighting the strengths and limitations of these approaches. However, one of the main challenges of machine learning techniques for personalized travel planning is the quality of the data used to generate recommendations. For example, inaccurate or incomplete data can lead to poor recommendations, and may not take into account the user's actual preferences. Additionally, machine learning algorithms are only as good as the data they are trained on. So, it is important to continually update and refine the data used in these systems. Another key consideration when using machine learning techniques for personalized travel planning is the user experience. In order to be effective, these systems need to be user-friendly and easy to navigate, providing clear and concise recommendations that are easy to understand. Additionally, users may want to have the ability to modify their preferences or exclude certain types of recommendations, so it is important to include user feedback mechanisms that can improve the quality of the recommendations. Authors conclude that machine learning techniques are very useful for personalized travel planning, with the potential to generate highly tailored recommendations that are tailored to the unique preferences of each individual. To be more effective, these systems must take into account various factors, including the data quality used, the user experience, and the ability to continually update and refine the system over time. By carefully considering these factors, machine learning techniques can help to revolutionize the way people plan and enjoy their travels.

II. Proposed Work

A. Problem Statement And Objectives

To develop Tour-Easy, a mobile application that integrates Google API to provide a complete trip-planning solution. Tour-Easy will include an intelligent recommendation engine that uses the data set of other tourists to suggest the best travel guide and a user-friendly interface that allows for smooth interaction. The main objectives of our app are as follows:

- To showcase relevant and up-to-date information about tourist destinations, including the attractions to provide the users with the most relevant and accurate information for their travel planning.
- To come up with an effective scheduling program that can generate a timetable for the users based on the nearby attractions and hotels based on the time limit entered by the user and all nearest tourist places.
- To provide a user-friendly platform that allows the users to interact with the application seamlessly and enhance their engagement with the application.

B. Proposed System

The system architecture of the Tour-Easy application is depicted in figure1. Here, the first step is user authentication. Once the user passes the authentication and logs into the application, Home screen appears which has 2 primal functions: first is the recommendation and suggestion of the place where a user enters the destination and looks through the catalog of selection which navigates to the index page which contains the details about the place they have chosen. Second is the scheduler Generate option which is present on the home screen using which the user can easily enter the time limit and then time table is generated which auto-picks the nearby tourist places from the destination the user has entered.

In paper [3], the author defines that machine learning techniques are becoming very useful in the field of personalized travel planning, as they can assist to generate recommendations for individuals based on their unique preferences. Considering these objectives, our App is integrated with API which uses various ML-algorithms to fetch the recommendations. The user interface allows the user to input their preferences, like time and the location name. It also displays the recommended itineraries, destinations, and restaurants. In Reference to various UI of various travel apps like Trivago, and Make My Trip, the screens are built and they are kept simple and easy to upgrade the UI smoothness.

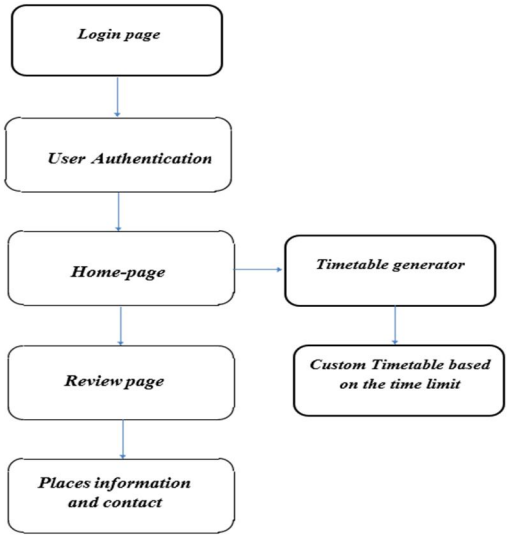

Figure 1*: System Architecture*

The schedule generator generates a schedule to efficiently cover tourist places according to the user's preferences. It also optimizes the time to have the best experience of the trip. The schedule generator which is found on home screen is a basic program that is added to the app. Tour Easy can integrate with external APIs or data sources to gather additional information about tourist destinations and other relevant data.

C. Tools and Technology

React Native

React Native is an open-source UI software framework created by Meta Platforms, Inc. It is used to develop applications for Android, Android TV, iOS, Mac OS, tv OS, Web, Windows, and UWP by enabling developers to use the React framework along with native platform capabilities. Our whole application is built using React Native. From the Home screen to the Scheduler page everything is written in JavaScript which is used for React Native Expo. The complete architecture is based on React Native due to its Platform Independence.

Google Maps API

Google Cloud APIs are programmatic interfaces to Google Cloud Platform services. They are the key part of the Google Cloud Platform, allowing you to easily add the power of everything from computing to networking, to storage to machine-learning-based data analysis to your applications. In our app, Google Maps APIs, Places API are used to autofill the destination which the user is trying to enter and also it fetches the coordinates of the place the user is trying to enter and these coordinates are used for the backend logic to recommend the places for user.

Tailwind CSS

Tailwind CSS works by scanning all of your HTML files, JavaScript components, and any other templates for class names, generating the corresponding styles, and then writing them to a static CSS file. Our app styling is done through the Tailwind CSS as it comes in handy while adding animations and effects to buttons. Also, the entire UI design styling is done through the Tailwind CSS which gives one line styling option.

Firebase

Firebase is Google's mobile app development platform Database. Its advantages include an end-to-end development environment to create apps and scalable infrastructure. Firebase is used for User-authentication and to store the login details of the user and also to verify the data. If the user chooses for Google sign-in option, firebase is the Database of the app which stores all types of data which will be required in the backend.

Rapid API

Rapid API, the world's largest API hub, is used by over three million developers to find, test, and connect to thousands of APIs — all with a single API key and dashboard. In our application, Rapid API is used to fetch the details of the nearby tourist places information. When the coordinates fetched from the places API is supplied, it provides the open/close status, review, and other related information of the place.

D. Results

Tour-easy is a comprehensive and user-friendly cross-platform application that serves as the ultimate personal travel guide. With a vast database of tourist places from around the world, Tour-easy provides users with a wealth of information and recommendations to enhance their travel experience. One of the standout features of Tour-easy is its efficient scheduling algorithm. Users simply input their destination and the duration of their trip, and the app generates a customized timetable that optimizes their itinerary. This algorithm ensures that users make the most of their time at each destination, maximizing their opportunities to explore and enjoy the attractions.

Tour-easy boasts a user-friendly interface that makes it incredibly easy to search for places of interest. Users can effortlessly browse through the app's extensive collection of tourist spots, complete with detailed descriptions, photos, and user reviews. The intuitive interface allows users to plan their trips seamlessly, save their favorite attractions, and organize their itinerary with just a few taps.

Figure 2: *UI for login*

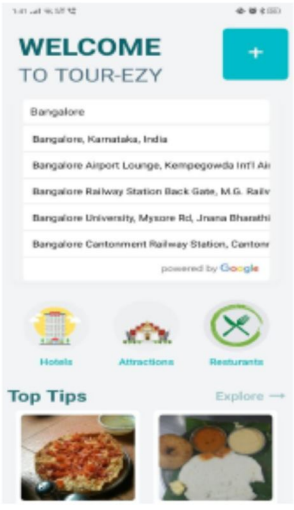

Figure 3: *Home Screen*

Figure 2 and Figure 3 depicts the User interface for Login and the Home Screen respectively.

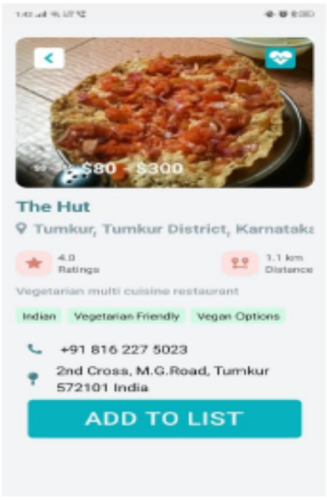

Figure 4: *Discover Page*

Figure 5: *Scheduler Page*

Figure 3 and Figure 4 depicts the interface for Discover Page and the scheduler page respectively.

IV. Conclusion

Tour-Easy is an innovative mobile application that leverages powerful APIs to offer users personalized travel recommendations tailored to their preferences, location, and timings. By combining advanced algorithms with comprehensive data on restaurants and tourist destinations, the app revolutionizes trip planning by providing valuable insights and optimizes users' time. With Tour-Easy, users can effortlessly plan their trips with confidence. The app's intuitive interface allows users to input their preferences, such as cuisine types, activity preferences, and attractions of interest. Leveraging this information, the app's intelligent recommendation system suggests the best restaurants and tourist destinations that align with the user's tastes and interests. Tour-Easy's personalized approach is a standout feature. If the tourists are searching for trendy restaurants, hidden gems, historical landmarks, or outdoor adventures, Tour-Easy provides them with personalized suggestions to create unforgettable travel experiences. Tour-Easy is an ML-Integrated mobile app that harnesses the power of APIs to deliver personalized travel recommendations and streamline trip planning. With its user-friendly interface, optimized scheduling algorithm, and emphasis on personalization, the app empowers users to efficiently plan their trips, discover new destinations, and make the most of their travel experiences. Tour-Easy is the ideal companion for modern travelers seeking convenience.

References

[1] M. S. B. W. T. M. P. S. B. Thennakoon, R. D. T. N. Rajarathna, S. P. B.Jayawickrama, M. P. D. S. M. Kumara, A. M. Imbulpitiya and N. Kodagoda, "TOURGURU: Tour Guide Mobile Application for Tourists," 2019 International Conference on Advancements in Computing (ICAC), Malabe, Sri Lanka, 2019, pp. 133-138, doi: 10.1109/ICAC49085.2019.9103380.

[2] T. Ghani, N. Jahan, S. H. Ridoy, A. T. Khan, S. Khan and M. M. Khan, "Amar Bangladesh - a Machine Learning Based Smart Tourist Guidance System," 2018 2nd International Conference on Electronics, Materials Engineering & Nano-Technology(IEMENTech), Kolkata,India,2018,pp.1-5

[3] Z. Wang and S. Poslad, "A Personalised Online Travel Time Prediction Model," 2013 IEEE International Conference on Systems, Man, and Cybernetics, Manchester, UK, 2013, pp. 3327-3332, doi: 10.1109/SMC.2013.567.

[4] A. Asri Computer Science Indonesian Journal of Electrical Engineering and Computer Science 2019.

[5] S. Elda Hiererra, Meyliana, A. Ramadhan and F. Purnomo, "Smart Tourism" Destinations Research Trend: A Systematic Literature Review," 2022 International Conference on ICT for Smart Society (ICISS), Bandung, Indonesia, 2022, pp. 1-11, doi: 10.1109/ICISS55894.2022.9915164.e, tailored recommendations, and an enhanced overall journey.