Travel Wise: RealTime Budget Estimation Application

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***Abstract*—Travel is a thrilling experience, but effective cost management can be tricky. Most current travel applications offer static budget estimates that are not adjusted for real-time currency fluctuations and price variations, and thus tend to be inaccurate for financial planning. Moreover, these applications are mainly concerned with bookings and not complete budget management, and hence travelers find it difficult to monitor and manage their costs. Travel Wise is an intelligent travel budget app that streamlines travelers' financial planning. The app provides estimated costs of accommodations, transport, food, and activities for its users depending on the destination and personal choices. The app keeps current budget estimates based on real-time currency exchange rates and domestic prices, and it ensures updated accuracy during a trip. With an easy, Travel Wise enables individuals to monitor expenses, be alerted as they approach the limits of their budgets, and get personalized guidance. Combining live cost tracking with advance knowledge, the app allows users to travel carefree while practicing money control, thus a useful accessory for carefree travel**

***Index Terms*—Travel Planning, Personalized recommendations, Budget estimates, Dynamic pricing, User preferences, Flutter, Firebase, Mobile Application**

I. INTRODUCTION

Travel is a thrilling experience, but managing costs during travel can be strenuous. From keeping records of hotel expenditures, travel, or daily spending, travelers typically find it difficult to stay within their budget limit. To manage the same, we introduce TravelWise, a live budget estimation app which plans and manages tourists' cost in an easy manner. Developed using Flutter and Dart, TravelWise delivers a seamless cross-platform experience and can be accessed on both Android and iOS. The Firestore-backed backend offers real-time data storage and synchronization, which allows users to track their expenses and receive budget insights in real time. Not only does our software give user-level cost estimates but also uses machine learning algorithms to identify potential anomalies and frauds. Leveraging the benefits of a clean UI and sophisticated backend functionality, TravelWise aims to improve financial planning for trips by making it more intuitive, secure, and convenient.

II. LITERATURE REVIEW

Tourism Route-Planning Approach Based on Comprehensive Attractiveness
Authors: Yanmei Zhang, Linjie Jiao, Zhijie Yu, Zheng Lin, Mengjiao Gan
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Paper Overview
This paper suggests a tourist route planning model based on user preference, cost, distance, popularity, and travel restriction. Unlike general shortest-path approaches, this framework integrates user-based variables such as ratings of sites, popularity ranking, and time taken to travel. This study emphasizes the role of multi-dimensional optimization for an enriched traveling experience

Challenges in Current Systems
Tiny personalization according to user interests. Non-integration with available travel information. Defective route models that do not dynamically adapt.
Key Contributions

Personalized route advice based on multi-factor optimization model. Integration of real-time popularity information and site ratings. Application of Genetic Algorithm (GA) for optimizing route.

IV. PROPOSED METHOD

The suggested system is a travel guide mobile app based on Flutter and Firebase. The system should provide better travel planning by providing real-time budgetary estimates, travel guidance, and tailored advice.

Key Features

Source & Destination Place: Source & destination places used in trip planning are user input. Saved for subsequent retrieval in Firebase Firestore. Transport Method & Booking Aid - Offers transportation availability in real time (rentals, flights, trains, local transit). Price, departure time, and booking status are offered. Hotel & Restaurant Recommendations: Gives hotel suggestions by location and price. Offers menu and restaurant suggestions. The trip budget estimate is the coordinated expenditure (tickets, hotel, food, and travel locally) organized based on planner budget priority. Places are searched based on category (historic, beach, cultural, and mountain).User Interface: New UI with interactive navigation and gradient appearance. Dropdown lists and sliders make user input effortless. Cloud-Based Data Management: Data of user travel is saved to Firebase Firestore. Offers safe authentication and updates in real time.

V. METHODOLOGY

The application follows an Agile Development Approach to ensure continuous improvement and user feedback integration

Key Features The application takes an Agile Development Approach to allow for constant improvement and integration of user feedback. Requirement Analysis Identified key functionalities: location choice, transport means, budget calculation, local services. Technology Stack

Frontend: Flutter (Dart)

Backend: Firebase (Firestore)

Storage: Firebase Cloud Storage

Authentication: Firebase Authentication (if required)

System Architecture Design

Adheres to MVC (Model-View-Controller) architecture.

View: Flutter UI widgets

Controller: Business logic

Model: Firestore database schema

UI/UX Design

Applied Material Design concepts.

Employed Bottom Navigation Bar for easy access. Backend & Database Integration: Firestore manages CRUD operations for travel information. Cloud Functions provide real-time data processing capabilities

Feature Implementation:

Location Selection: Dropdown list where city selection is saved in Firestore.

Transport Options: Transport category data shown through ListView.builder.

Budget Management*: User inputs analyzed into Pie Charts & Bar Graphs.

Nearby Services: Transport categories loaded dynamically from Firestore.

Tourist Spots Recommendation: Attraction search based on filters.

Testing & Debugging

Unit Testing: Testing of Flutter widgets.

User Testing: Performed beta tests.

Performance Testing: Firestore query optimization

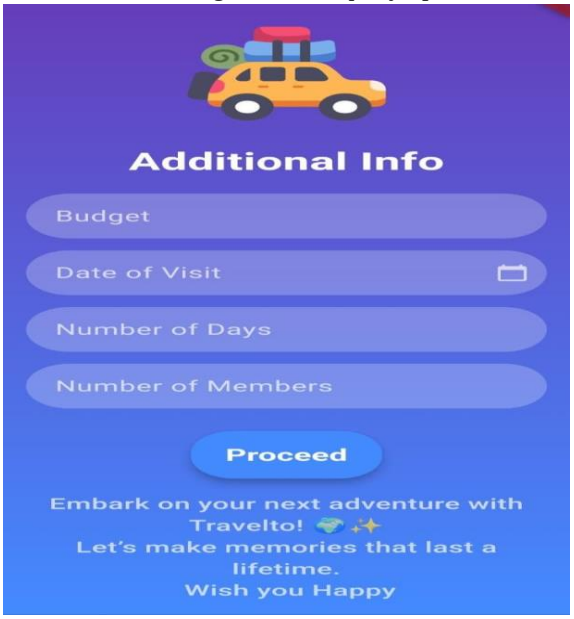

Fig 5.1

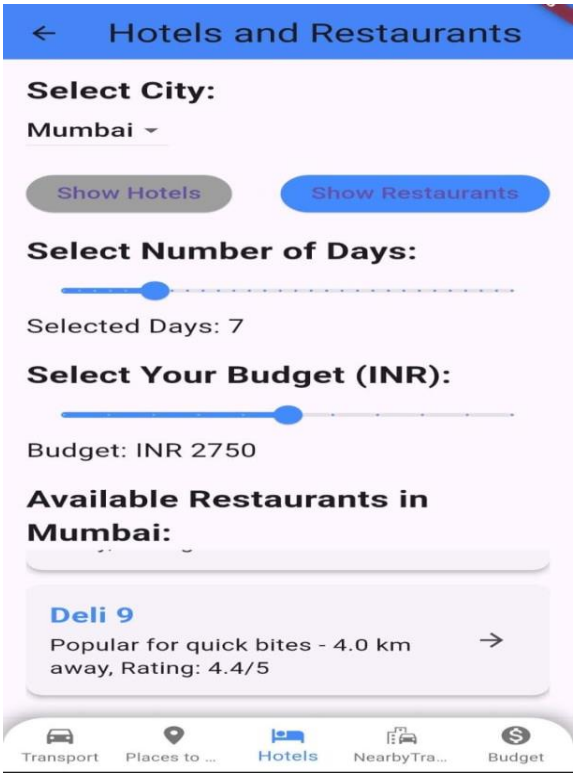

Fig 5.2

Deployment & Maintenance

Launched in Google Play Store and App Store

Ongoing updates based on customer reviews

VI. DATA FLOW DIAGRAM

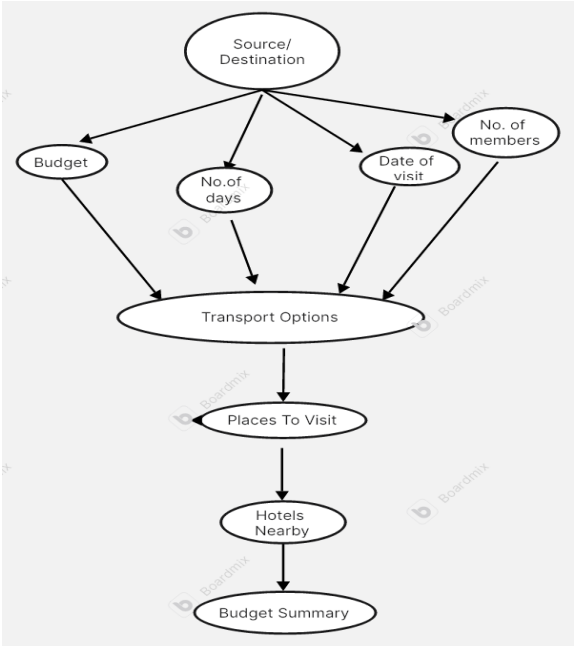

Fig 6.1

VII. IMPLEMENTATION

TravelWise is an interactive multi-page system where users are able to input their travel details and receive optimized suggestions. The app features are as follows: User inputs the destination and departure location. Budget and Trip Details User inputs the approximate expense, travel dates, length of stay, and number of travelers. Travel and Accommodation Suggestions. The system accepts the input data given and gives back a specially chosen list of transportations, tourist attractions, hotels, and restaurants within budget. Budget Breakdown Visualization A pie chart is generated in order to show the distribution of the spending in different categories.

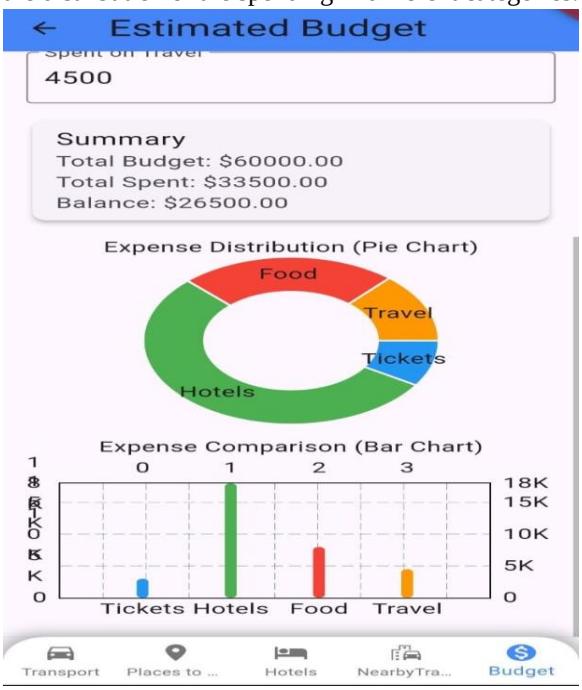

Fig 7.1

VIII. RESULT

The app effectively gives precise budget estimations. Live transport data adds to the convenience of users. Customized travel suggestions enhance the efficiency of trip planning.

IX. CONCLUSION

TravelWise, in this context used in this paper, is a mobile application that guarantees ease of travel with on-demand real-time budget estimation and transport

assistance. Cloud storage integration, real-time dynamic transport availability, and personalized recommendations are the aspects that guarantee TravelWise as an excellent travel companion. Predictive analytics for dynamic budgeting with AI can be integrated in future work.

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