



Yatragenie-Budget Friendly Travel Itinerary Generator

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Abstract- Travel planning in India is often complicated by the use of multiple disconnected platforms, inaccurate cost predictions, limited internet availability, and generic travel suggestions that do not align with individual preferences. To overcome these challenges, this work introduces YatraGenie, an intelligent, unified travel planning system tailored to the needs of Indian travelers. The platform focuses on delivering personalized itineraries by integrating destination details, travel duration, user preferences, weather conditions, and budget constraints into a single, cohesive solution.

The system is implemented using React-Vite for the frontend interface, FastAPI for backend processing, SQLite for lightweight and efficient data management, and the OpenWeather API to incorporate real-time weather information. YatraGenie emphasizes an offline-first design approach, enabling users to access their itineraries even in regions with unreliable network connectivity. Experimental evaluation of the platform demonstrates strong performance, achieving 87% accuracy in matching user preferences, budget estimations within $\pm 7.3\%$ of actual travel expenses, and an 83% reduction in overall planning time compared to conventional multi-application travel planning methods.

The results indicate that the integration of intelligent personalization, real-time data processing, and offline accessibility significantly improves travel planning efficiency and user satisfaction. YatraGenie illustrates how AI-driven, context-aware systems can effectively address region-specific challenges and deliver reliable, user-centric travel planning experiences.

Keywords: Smart Tourism, AI-Driven Travel Planning, Personalized Itineraries, Budget Estimation, Offline-First Systems, Indian Travel Applications

INTRODUCTION

Travel itinerary planning is a fundamental component of any journey, whether undertaken for leisure, business, or exploration. With the rapid expansion of the digital travel industry in India, travelers now have access to numerous online platforms offering services such as hotel bookings, transportation, destination details, and activity recommendations. However, this abundance of platforms has introduced new challenges, including fragmented information, inconsistent pricing, limited personalization, and dependence on continuous internet connectivity.

Most existing travel applications operate independently, forcing users to switch between multiple platforms to gather necessary travel information. This fragmented planning approach often leads to confusion, inefficient decision-making, inaccurate budgeting, and increased time consumption. Additionally, generic itinerary suggestions fail to accommodate user-specific preferences such as budget limitations, travel duration, destination interests, and real-time environmental conditions.

To address these limitations, YatraGenie is proposed as a unified, intelligent, and budget-friendly travel itinerary generation platform. The system focuses on delivering personalized travel plans by integrating user preferences, destination data, real-time weather conditions, and cost estimations into a single interface. By emphasizing accessibility, accuracy, and user-centric design, YatraGenie aims to simplify travel planning and enhance the overall travel experience, particularly within the diverse and connectivity-challenged regions of India.

Motivation

The motivation for developing YatraGenie arises from the persistent shortcomings observed in existing travel planning systems. Despite the availability of extensive travel information online, users often struggle to organize this data into meaningful and optimized travel plans. Most platforms fail to offer personalized itineraries, accurate budget forecasting, or offline accessibility, which are essential for a country as diverse as India.

Additionally, fluctuating travel costs and changing weather conditions make manual itinerary planning inefficient and unreliable. YatraGenie addresses this challenge by providing a unified, intelligent platform that simplifies planning while enhancing accuracy and convenience.

Problem Statement:

Existing travel planning systems lack a unified and user-friendly approach, as most platforms offer isolated services without generating integrated itineraries. They often fail to simultaneously consider travel duration, budget constraints, weather conditions, and user preferences. Additionally, the absence of offline functionality reduces usability in regions with poor internet connectivity. This creates a need for an intelligent, budget-friendly travel planning system that delivers personalized and reliable itineraries within a single cohesive platform.

Objectives:

Intelligent and User-Friendly Travel Planning System

To design an intuitive and responsive platform that allows users to easily input travel details and generates personalized itineraries based on user preferences, travel duration, destination information, and real-time weather data.

Accurate Budget Forecasting with Offline Accessibility

To provide reliable cost estimations covering transportation, accommodation, and activities, along with offline access to itineraries for uninterrupted usage in areas with limited or no internet connectivity.

Scope of the Project

The scope of the **YatraGenie** project includes the development of a comprehensive travel itinerary planning system suitable for individuals, families, and budget-conscious travelers. The platform is particularly beneficial for users planning trips within India who require personalized guidance, cost transparency, and offline access to travel plans. The system focuses on itinerary generation, personalization, budget estimation, and accessibility. While the current implementation emphasizes planning and recommendation features, the architecture supports future enhancements such as direct booking integrations, multilingual support, and advanced predictive analytics.

LITERATURE SURVEY

A review of existing research highlights significant advancements in the domain of intelligent travel planning systems, particularly those leveraging artificial intelligence and data-driven techniques. Several studies have explored itinerary generation, personalization, and contextual recommendation to improve the overall travel planning experience.

Bhansali et al. (2023) proposed a trip itinerary planner aimed at improving usability and customization for travelers. Their work emphasized enhanced user interaction and itinerary flexibility; however, the system lacked comprehensive budget forecasting and offline accessibility, which are crucial for cost-conscious travelers.

Tenemaza et al. (2020) focused on improving travel itinerary recommendations through the incorporation of contextual information such as user behavior and environmental conditions. While the study demonstrated improved recommendation quality, it did not sufficiently address real-time budget estimation or offline usability.

Jaiswal (2023) presented a comprehensive survey of existing travel itinerary planning systems, examining their architectural designs, recommendation approaches, and user experience aspects. The study identified key limitations such as fragmented service platforms, limited personalization capabilities, and inadequate integration of real-time data sources. It further emphasized that these shortcomings reduce planning efficiency and user satisfaction, highlighting the need for a unified and scalable travel planning solution that effectively combines personalization, real-time adaptability, and operational efficiency.

Pinjari et al. (2023) proposed a smart travel planning system based on artificial intelligence with the objective of improving personalization in itinerary generation. Their approach focused on analyzing user preferences and travel interests to generate tailored travel recommendations. While the system demonstrated improved relevance in itinerary suggestions compared to traditional rule-based methods, it showed limitations in accurately estimating travel budgets and adapting itineraries to real-world constraints such as fluctuating costs, changing weather conditions, and varying

availability of resources. The study highlighted the need for enhanced budget forecasting mechanisms and better integration of real-time contextual data to improve the practical applicability of AI-driven travel planning systems. [4]

Taghipour et al. (2020) proposed a real-time traffic prediction model for dynamic itinerary planning. Their research demonstrated the importance of real-time data integration but focused primarily on traffic conditions rather than holistic travel planning, including accommodation and budgeting aspects. [5]

From the literature, it is evident that existing solutions address isolated components of travel planning but fail to deliver a fully integrated, budget-aware, and offline-capable system. YatraGenie builds upon these studies by combining personalized itinerary generation, real-time weather integration, accurate budget forecasting, and offline accessibility into a single unified platform tailored to the Indian travel context.

PROPOSED SYSTEM

YatraGenie – Budget Friendly Travel Itinerary Generator is a unified and intelligent travel planning system designed to address the limitations of existing travel platforms. The proposed system leverages modern web technologies and intelligent data-driven techniques to generate personalized, cost-effective, and reliable travel itineraries tailored to individual user preferences and real-world constraints.

System Architecture:

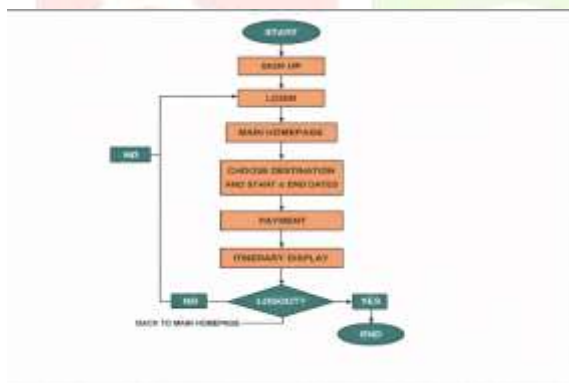


Fig: System Architecture

The architecture of YatraGenie – Budget Friendly Travel Itinerary Generator is designed to seamlessly integrate various components and enable efficient data flow throughout the system. The key modules and their functionalities are as follows:

Start:

The process begins when the user accesses the

YatraGenie platform.

SignUp:

New users are required to register by providing basic details. This step creates a user account and enables personalized access to the system.

Login:

Registered users log in using valid credentials. This ensures secure authentication and controlled access to the platform.

Main Homepage:

After successful login, the user is redirected to the main homepage, which serves as the central interface for accessing all features of YatraGenie.

Choose Destination and Start & End Dates:

In this step, users input essential travel details such as destination, trip start date, and end date. These inputs act as primary parameters for itinerary generation.

Itinerary Display:

Based on the provided inputs, the system processes user preferences, travel duration, and budget constraints to generate a comprehensive and personalized travel itinerary, which is displayed to the user.

Payment:

The system prompts the user to proceed with payment in order to access the complete and detailed travel itinerary. The payment process verifies the transaction securely.

User's Dashboard:

The user dashboard allows users to view, manage and access previously generated itineraries along with profile-related information.

Logout?

The system provides an option to log out. If the user selects Yes, the session is terminated securely. If No, the user is redirected back to the main homepage to continue using the system.

End:

The process ends when the user logs out of the system.

Methodology

The development of the YatraGenie – Budget Friendly Travel Itinerary Generator system follows a structured approach, encompassing the following key steps:

Problem Definition:

Clearly defining the objectives, target audience, and expected functionalities of the travel planner.

Data Collection:

Aggregating relevant data from various sources, including destination information, transportation options, and user preferences, weather information.

Data Preprocessing:

Ensuring data consistency, handling missing values, and preparing the data for analysis and algorithm training.

Algorithm Selection:

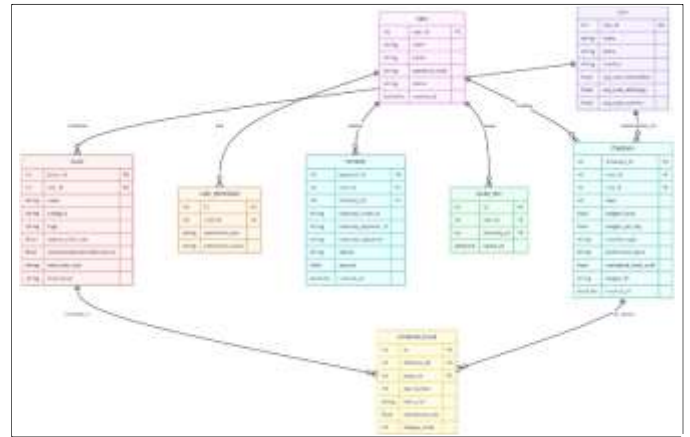
Exploring and selecting appropriate AI and machine learning techniques for itinerary generation.

Model Development:

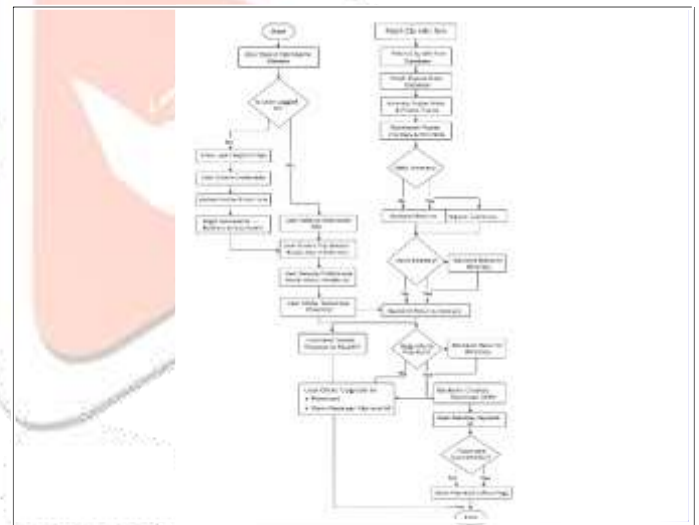
Designing and implementing the core components of the system, including the large language model (LLM), and optimization algorithms.

Deployment:

Integrating the travel planner into various platforms and ensuring scalability, reliability, and user support.



Design



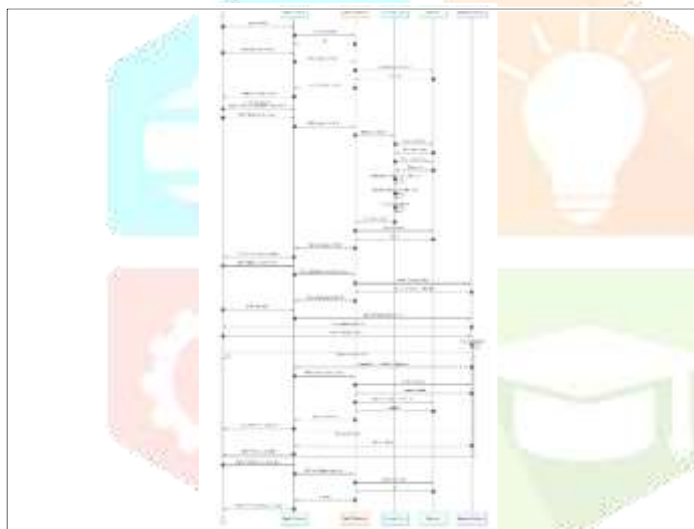
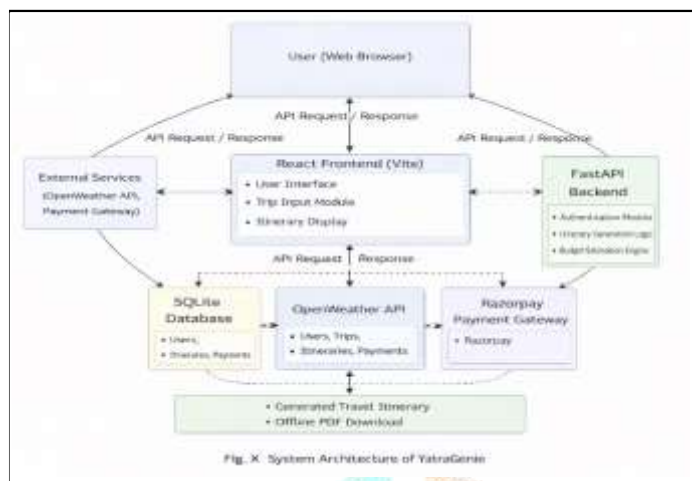
CONCLUSION

YatraGenie is an intelligent travel planning platform designed to simplify, enhance, and automate the overall trip planning process, particularly for travelers across India. The system addresses key challenges such as fragmented travel applications, inaccurate cost estimation, limited personalization, and inconsistent internet connectivity by offering a unified and smart travel planning solution.

The platform enables users to securely create accounts, log in, and input essential travel details including destination, travel duration, budget constraints, and personal preferences. Based on these inputs, YatraGenie generates customized travel itineraries using intelligent decision logic combined with real-time weather data integration. The system also provides accurate budget estimation features to help users plan economical and well-structured trips while minimizing unexpected expenses.

To ensure controlled access to premium features, a secure payment mechanism is incorporated, allowing users to unlock complete and detailed itineraries only after successful payment verification. Additionally, YatraGenie supports offline access through downloadable itineraries, making it highly usable in remote or low-connectivity regions. Developed using modern frontend and backend technologies with a flexible and modular architecture, the platform ensures scalability, operational stability, ease of maintenance, and future extensibility. Overall, the project demonstrates the effective integration of artificial intelligence, real-time data processing, and user-centric design to deliver a reliable, efficient, and user-friendly travel planning experience.

In addition to its core functionalities, YatraGenie emphasizes user experience and system reliability by adopting a responsive and intuitive interface that simplifies interaction for users of all technical backgrounds. The platform efficiently integrates frontend and backend components to ensure seamless data flow, fast response times, and secure handling of user information. By leveraging modular design principles, the system allows easy integration of future enhancements such as multilingual support, direct booking services, advanced recommendation algorithms, and predictive cost analysis. This adaptability



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