

AI-Based Intelligent Trip Planning and Recommendation System

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Abstract: *The AI Trip Planner and Recommendation System is an intelligent travel management system that uses Artificial Intelligence (AI) and Machine Learning (ML) to automate the trip planning, discovery of destinations, and hotel booking. The system brings together various APIs like Gemini AI, Razorpay, OpenStreetMap and Weather API to enable a full end to end personalized travel experience. The system was developed using Python (Django Framework) programming language with a SQLite database to provide the user with an engaging web-based platform where the users can plan trips, discover routes, bring up maps, and securely book hotels. The AI model utilizes user preferences around budget, type of destination and length of stay to generate a personalized leisure travel plan. The system will also provide live weather information, a payment gateway for bookings to hotels, and an AI chat-bot for real-time travel recommendations.*

Keywords: Artificial Intelligence (AI), Machine Learning (ML), Trip Planning, Travel Recommendation System, Personalized Travel, Destination Discovery, Hotel Booking, Gemini AI, Razorpay API, OpenStreetMap, Weather API, Django Framework, Python Programming, SQLite Database, AI Chatbot, User Preferences

I. INTRODUCTION

Artificial Intelligence (AI) is becoming a central component of automation, personalization, and smart decision-making making across several industries, including tourism and travel management. The traditional trip planning process is always slow and cumbersome with time-consuming activities related to gathering destination information, comparing hotels, checking weather, and scheduling payments manually. To address this issue, the AI Trip Planner and Recommendation System has been created as a smart, user-centric web platform that automates travel planning from start to finish utilizing AI technologies and web-based integration tools. The system makes use of the Django Framework for backend management and relies on SQLite for data storage, which means that user information and bookings are handled in a secure and efficient way.

II. PROBLEM STATEMENT

Manual tour planning is complex, cumbersome, and involves a great deal of research on different platforms for the place to be visited, routes, accommodation options, and other travel-related information such as weather. Most travelers experience frustration when trying to find personalized recommendations based on their preferences regarding budget, type of destination, and duration. Existing travel planning systems either provide static recommendations or lack the integration of intelligent automation.

III. OBJECTIVES

- To design a user-friendly web-based system that helps users plan and manage trips efficiently..
- To To ensure secure online transactions for hotel bookings through a payment gateway



- To store and manage user data effectively using the Django framework with a SQLite database
- To implement a secure payment gateway for online hotel bookings.
- To offer real-time weather updates and route visualization for better travel decisions

IV. LITERATURE REVIEW

Year and Author Kumar, A., et al. (2024). AI-based route optimization for travelers.

Kumar's group used AI algorithms to find the best travel routes and predict traffic. They found that route planning accuracy improved by nearly 30% compared to manual map searches. [1]

Patel, R., et al. (2025). Smart tourism and hotel booking integration using APIs.

Patel and his team combined weather, map, and payment APIs into one platform. Their research showed that this integration made online travel booking faster and safer for users. [2]

Zhang, Y., et al. (2023). Chatbot-based tourist assistance system.

Zhang and his colleagues introduced a chatbot that could guide travelers, suggest nearby attractions, and answer queries. Users said it made their travel experience smoother and more interactive. [3]

Lee, H., et al. (2024). Personalized itinerary generation using deep learning.

Lee's group made a deep learning system that studied traveler habits to build unique travel plans. Their work proved that users spent less time planning and were more satisfied with the AI-generated itineraries. [4]

V. METHODOLOGY

Data Collection and Preprocessing: The system collects user inputs such as destination, budget, number of travelers, and duration. Additional data is fetched dynamically through external APIs, including weather, maps, and location services.

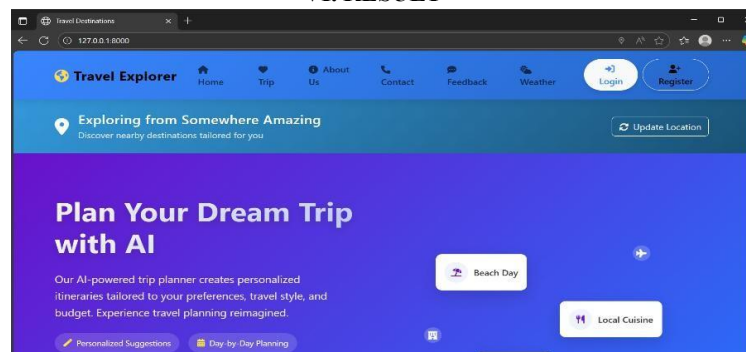
Recommendation Engine: To provide suggestions for destinations, hotels, and attractions based on user interests, both AI and rule-based algorithms are leveraged. The logic of the recommendation considers variables like popularity, distance, weather, and price, and outputs an optimized trip itinerary

Web-Based Platform: The platform is developed using the Django Framework, providing a secure, modular, and interactive interface. Users can plan trips, explore destinations, view routes, and make bookings seamlessly.

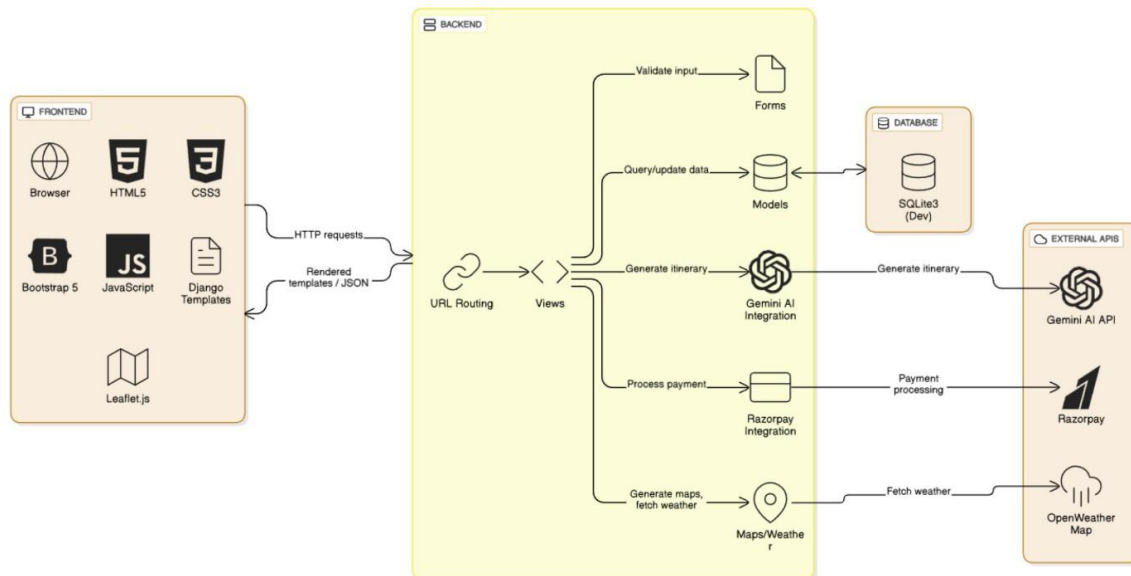
Payment Integration: A Razorpay payment gateway is integrated to enable users to complete hotel or trip bookings safely and efficiently. This ensures reliable and encrypted transactions within the system.

Location-Based Services: OpenStreetMap and Folium APIs are incorporated for visualizing travel routes, nearby attractions, and hotels. These geospatial tools enhance trip planning accuracy and assist travelers in identifying key locations on an interactive map.

VI. RESULT



VII. SYSTEM ARCHITECTURE



System Architecture – Main and Key Points Main Overview:

The Learn Bridge system is mainly built with three sections — frontend, backend, and database. Each section has its own job but they all work together to make the platform run easily and safely. The idea is to keep it simple so that students, teachers, and seniors can use it without any difficulty.

Frontend:

It's The user interface is developed with the Django Framework which utilizes HTML, CSS, and JavaScript. Elements such as login, registration, and password authentication are incorporated to achieve guaranteed security to deliver an interactive user experience that is personal and safe.

AI-Based Recommendation Module:

An intelligent recommendation engine processes user inputs such as budget, destination, and duration to suggest travel routes, hotels, and activities.

It also checks user login, manages doubts, and controls access rights.

Map and Geospatial Services:

The platform utilizes the capabilities of OpenStreetMap and Folium libraries for interactive visualization of routes and nearby tourist attractions..

VIII. BENEFITS TO SOCIETY

Learn Bridge makes college learning more open and easy for everyone. It gives juniors a safe place to ask their questions without feeling shy or scared of being judged. This helps them get clear guidance whenever they are confused. Seniors also get a good chance to build their confidence, leadership, and communication skills by helping and guiding juniors. Since doubts are cleared faster, students can understand topics better and don't waste time staying stuck on small problems. The platform also creates a friendly environment where students help one another, which builds teamwork and a sense of belonging. In this way, Learn Bridge not only improves learning but also makes education more equal and helpful for all students.



IX. CONCLUSION

The AI Trip Planner and Recommendation System offers an intelligent and automated solution for contemporary travel management. By embracing artificial intelligence-driven recommendations, map-based visualizations, real-world weather updates, and secure online payment systems, the trip-planning process is greatly simplified. Furthermore, the use of Django, OpenStreetMap, and Razorpay in the planning system assures reliability, scalability, and user-friendly experience. In addition, the AI-based chatbot enhances engagement by assisting users in real time with travel queries and suggestions. As a result, the system illustrates how artificial intelligence and web technologies can generate smarter, data-driven, and user-friendly experiences in traditional tourism. Moreover, real-time weather updates and data-driven recommendations greatly enhance the travel arrangement decision-making process.

X. FUTURE SCOPE

The AI Trip Planner and Recommendation System could be improved even further to create more advanced, adaptive, and intelligent travel planning. Future developments may feature the integration of Machine Learning models that would analyze user behavior and increase the accuracy of destination and hotel recommendations. The systems can be extended to include real time travel data, such as flight and train schedules, live traffic feeds, and dynamic pricing data. Integrating IoT and wearable devices can also provide contextually relevant travel assistance, such as navigation alerts, or health-related travel suggestions. Multilingual and voice assistant support could also be incorporated to make the platform more accessible to more people.

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