Dynamic Travel Itinerary Planner

Final Presentation Report - Generative AI Project

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BUDT758O - Fall 2025

Executive Summary

The travel industry grapples with the challenge of overwhelming trip planning, leading to traveler frustration and lost revenue for agencies. The Dynamic Travel Itinerary Planner, a Generative AI solution, addresses this by delivering personalized, adaptive itineraries that integrate real-time data and user preferences. This report outlines the problem, solution, demonstration, implementation, regulatory alignment, and impact, supported by a 5-minute presentation.

Business Problem and Industry Context

Planning a trip involves balancing budget, interests, and real-time variables like weather or closures. Existing tools offer static plans, requiring manual tweaks that deter 40% of users from completing bookings[1]. This abandonment costs travel agencies millions annually. Recent industry trends highlight a demand for AI-driven, adaptive solutions, with generative AI adoption in travel projected to grow by 25% by 2027[2].

Proposed Solution

The AI Travel Itinerary Planner combines OpenAI's large language model (LLM) with real-time travel APIs to automatically generate personalized, day-by-day itineraries. It uses live data from flights, hotels, weather, events, and attractions to create detailed and natural-sounding trip plans tailored to each user's preferences. Key features include the following:

• Personalized Trip Creation: Generates custom itineraries based on the user's origin, destination, travel dates, budget, party size, and interests.

• Real-Time Data Integration: Pulls live information from Amadeus (flights and hotels), Ticketmaster (events), TripAdvisor (attractions), Yelp (local cuisine), and OpenWeather (weather forecasts).

• AI-Powered Summaries: Uses OpenAI's LLM to transform raw travel data into natural, human-like trip summaries and daily schedules.

• Explain & Modify Function: Allows users to request itinerary changes (e.g., "add more food places" or "make it cheaper") and provides clear AI-generated explanations for each adjustment.

• Clean Interactive Interface: Displays trip summaries, detailed itineraries, and AI explanations in an easy-to-read, dynamic web layout built with HTML, CSS, and JavaScript.

This addresses the market gap for adaptive, user-centric planning, enhancing completion rates and customer loyalty.

Demonstration Details

• Generate a Live AI Itinerary: Enter real travel details (e.g., origin, destination, dates, budget, and interests). The system connects to live APIs (Amadeus, Ticketmaster, TripAdvisor, Yelp, and OpenWeather) to gather up-to-date flight, hotel, event, and weather data.

• AI Trip Summary Creation: OpenAI's LLM reads the collected API data and writes a natural, human-like summary for each day — including flights, hotel check-ins, meals, and suggested activities.

• Real-Time Insights: Demonstrate how each output (flight, hotel, weather, or activity) reflects current API data, not preloaded samples.

• Explain or Modify the Trip: Enter a natural request such as *"add food places"* or *"reduce budget"*, and the system uses OpenAI to explain or adjust the trip details accordingly.

• Visual Output Display: Show the frontend updating instantly with formatted trip summaries, itinerary cards, and AI explanations in an interactive web interface.

Technical Implementation

The system integrates:
• Data Sources: APIs from Amadeus (flights and hotels), Ticketmaster (local events), TripAdvisor (attractions and restaurants), Yelp (local cuisine), OpenWeather (weather forecasts), and OpenAI (generates human-like trip summaries and explanations).
• Frontend: Built using HTML, CSS, and JavaScript, providing an interactive interface for user input and real-time display of AI-generated itineraries.
• AI Model: An OpenAI Large Language Model (LLM) processes trip data and user requests, generating summaries and explanations through contextual reasoning.
• Interface: A dynamic web interface that allows users to enter preferences and request changes using natural language.
• Backend: Developed in Python (FastAPI) to manage API connections, process data, and integrate the LLM for AI responses.

Regulatory and Ethical Considerations

The system is designed with a strong emphasis on responsible AI use, data privacy, and transparency. It connects exclusively to licensed, verified APIs such as Amadeus, Ticketmaster, TripAdvisor, Yelp, and OpenWeather in order to gather real, up-to-date travel information, avoiding any use of scraped or unverified data.

All user inputs remain private and are used only for itinerary generation; no personal information is stored or shared with third parties. The OpenAI language model is used solely to generate trip summaries and explanations, ensuring clarity and neutrality in recommendations.

By combining multiple reliable data sources, the system minimizes potential bias and promotes fair, data-driven travel suggestions. Users remain fully in control of their itineraries, with the ability to review and adjust any AI-generated plans, maintaining both accuracy and ethical integrity.

Impact and Future Potential

Industry research suggests that similar AI-driven travel tools have increased traveler satisfaction by up to 35% and booking conversions by 20%[3]. Future enhancements could include multi-destination planning and predictive analytics for travel trends, positioning the Dynamic Travel Itinerary Planner as a potential market leader.

Conclusion

The Dynamic Travel Itinerary Planner demonstrates how generative AI can transform the travel experience by turning complex trip planning into a seamless, personalized process. Its adaptive design integrates real-time data, user preferences, and ethical AI practices to deliver reliable and context-aware recommendations. By addressing both traveler frustrations and agency inefficiencies, the system highlights the real-world potential of generative AI to create value through automation, personalization, and transparency. Looking ahead, the project sets the foundation for future enhancements such as multi-destination planning and predictive analytics, positioning it as an innovative and scalable solution for the evolving travel industry.

References

1. Travel Industry Association. *Travel planning behavior and booking abandonment trends*. 2024.
2. McKinsey & Company. *The future of generative AI in the travel industry*. 2025.
3. Deloitte. *AI adoption and customer satisfaction in travel and hospitality.* 2025.