

# **Travel Sphere – AI Trip Planner**

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**Abstract:** *Trip planning can be complicated and take a lot of time. Travelers often need to consider several things like where to go, how much money they can spend, how long they will stay, and how many people are going. Usually, travel planning services don't offer flexible and personalized plans that fit each traveler's needs, which leads to not-so-good travel experiences. To help with this, Travel Sphere is an AI-powered trip planning platform that uses the Gemini API to understand user preferences and create detailed, customized itineraries. The system gives day-by-day schedules along with hotel suggestions, making sure the travel plan fits exactly what the user wants. Travel Sphere also provides pre-made travel packages with ready-to-use itineraries, which is helpful for people who like structured, planned trips. The platform helps travelers by offering real-time activity suggestions, safety alerts, and route recommendations based on their current location, making the trip more enjoyable and safe. By combining AI-driven planning, static package options, and real-time updates into one place, Travel Sphere makes trip planning easier, smarter, and more personal for everyone.*

**Keywords:** AI Trip Planner, Artificial Intelligence in Travel, Smart Travel Planning, Personalized Trip Recommendations, Gemini API Integration, Real-Time Location Services, Travel Itinerary Generation.

## **I. INTRODUCTION**

Travel planning is now a big part of modern life, yet it's still hard and takes a long time. Things like choosing the right place to stay, arranging activities, and managing money are just a few of the challenges people face. Traditional travel agencies often give inflexible itineraries with little room for personalization, while planning manually requires a lot of time and effort. Because of this, many people struggle to create travel plans that match their preferences and budget. To solve these problems, TravelSphere is an AI-powered platform that automatically makes personalized travel itineraries based on what users input, such as where they want to go, how long they're staying, how much they can spend, and how many people are going. The system gives detailed daily schedules with hotel suggestions, and it also offers pre-made packages for people who like ready-to-go plans. TravelSphere also has real-time location-based features that give activity recommendations, safety alerts, and route suggestions, keeping travelers informed. By combining AI-based itinerary creation, static package choices, and real-time location insights into one platform, Travel Sphere is making trip planning more efficient, personalized, and adaptable.

### **1.1 Motivation**

In today's fast-paced world, travelers are looking for personalized and easy ways to plan their trips. However, traditional travel planning methods usually don't meet these expectations. Researching manually is time-consuming and requires checking multiple sources for information on destinations, hotels, and activities. Fixed packages from agencies are also not flexible enough to fit personal needs like budget, trip length, and group size, often leading to travel experiences that don't meet modern expectations. These issues led to the creation of Travel Sphere, an AI-powered platform that simplifies and improves the trip planning process. The system automatically creates personalized itineraries based on user input and provides real-time travel suggestions and safety alerts based on where the user is. It also offers static trip packages with booking options for those who prefer structured plans, balancing flexibility and convenience. Travel Sphere was made to give travelers a single, user-centered platform that makes the fragmented trip planning process smooth and personalized.



### 1.2 Problem Statement

Trip planning involves many factors, like where to go, how long to stay, how much to spend, and how many people are traveling. Current planning methods, whether through manual research or pre-made packages from travel agencies, don't really meet the unique needs and constraints of individual travelers. Manual planning is tedious, requiring users to go through a lot of information from different sources, which leads to mistakes and inefficiencies. Pre-defined packages are not flexible enough to tailor itineraries to specific traveler needs. Plus, the lack of real-time, location-based support means travelers often miss important safety alerts, activity suggestions, and route recommendations relevant to their current surroundings, which affects their entire trip experience. Without a smart system that adapts to user preferences and real-time conditions, travelers often end up with poor plans that don't use their time, budget, or interests well. Therefore, there's a clear need for a smart platform that provides personalized trip planning, static package alternatives, and real-time recommendations to offer travelers a seamless, efficient, and fully customized experience.

### 1.3 Objectives

- To develop an AI-powered platform that generates personalized travel itineraries by analyzing user-defined preferences such as destination, trip duration, budget, and group size.
- To provide comprehensive day-by-day itineraries with curated hotel recommendations and activity suggestions, ensuring that the generated plans align with individual user expectations.
- To integrate static trip packages featuring pre-defined travel plans with detailed itinerary information and seamless booking options, catering to users who prefer structured travel experiences.
- To implement real-time location-based services that deliver timely travel alerts, nearby attraction suggestions, and contextual activity recommendations, enhancing the overall safety and quality of the travel experience.

### 1.4 Scope of the Project

Travel Sphere is designed to make the travel planning experience better and simpler by meeting the various needs of modern travelers through three main features. First, the platform uses AI to understand user preferences, including where to go, how long the trip will be, budget, group size, and specific interests, to create fully customized daily itineraries that fit each user's needs. Second, for people who like structured travel experiences, Travel Sphere offers static trip packages that include pre-made itineraries along with hotel, transportation, and sightseeing options, ensuring a smooth booking experience with an integrated payment system. Third, the platform has real-time location-based services that provide activity suggestions, safety alerts, and relevant travel tips based on where the user is. Travel Sphere also allows groups to plan trips together, making it easier for people to coordinate their itineraries and preferences in one place. Built with a scalable and secure system and a user-friendly interface, Travel Sphere is a complete, intelligent, and reliable solution for modern travel planning. It has the potential to expand its destination database and AI capabilities in the future, but for now, it doesn't include flight booking, visa processing, or travel insurance, which might be added later to make it a full-end-to-end travel planning service. Travel Sphere allows users to save, access, and manage their travel plans in one place. Travelers can view past trips, bookmark favorite destinations, and easily revisit or modify their itineraries for future use. The platform provides personalized recommendations for hotels, restaurants, attractions, and local experiences based on user preferences and previous travel behavior, helping travelers discover options that best match their interests. Travel Sphere includes a smart notification system that keeps users updated with itinerary reminders, weather forecasts, local events, and important travel alerts, helping them stay informed throughout their journey. The platform enables users to rate and review destinations, accommodations, and activities after their trip, creating a community-driven knowledge base that helps future travelers make better decisions.

## II. LITERATURE REVIEW

Tenemaza et al. (2020), in their study published in IEEE Access, proposed the incorporation of contextual information to enhance travel itinerary recommendations. Their research highlighted the limitations of existing travel



recommendation systems in accounting for dynamic factors such as real-time user preferences and current environmental conditions, emphasizing the need for a more flexible and user-centric approach to travel planning.

Jaiswal (2023), in a comprehensive review published in the International Journal of Advances in Engineering and Management (IJAEM), evaluated the strengths and shortcomings of existing trip planning systems. The study identified a significant gap in the availability of a unified platform capable of combining personalized itinerary generation, real-time recommendations, and static trip packages within a single cohesive solution.

Patel et al. (2022), in their study published in the International Journal of Computer Science and Information Technologies (IJCSIT), presented an AI-driven model for generating travel itineraries based on historical data and user preferences. However, the study acknowledged that such algorithms frequently struggle to incorporate real-time environmental parameters — such as weather updates and location-based recommendations — thereby limiting their effectiveness in dynamic travel scenarios.

The aforementioned studies collectively highlight three key gaps in existing travel planning systems: the lack of real-time contextual adaptability, the absence of personalized itinerary generation, and the unavailability of a unified platform integrating both static and dynamic planning options. Travel Sphere addresses these gaps by combining AI-generated personalized itineraries, pre-defined static trip packages with booking capabilities, and real-time location-based recommendations into a single integrated platform — offering a smooth, flexible, and comprehensive travel planning solution for modern travelers.

### **III. METHODOLOGY**

Travel Sphere follows a structured and systematic methodology to deliver personalized travel itineraries, static trip packages, and real-time location-based recommendations. The platform operates through the following key steps:

Users interact with an intuitive interface to provide essential travel details, including destination, trip duration, budget, and group size. These inputs serve as the foundational parameters for generating customized travel itineraries tailored to individual preferences and requirements.

The collected user inputs are processed by the Gemini API, which analyzes the provided parameters to generate a comprehensive day-by-day travel itinerary along with four curated hotel recommendations. The AI engine evaluates user preferences to produce realistic, optimized, and practical travel schedules that align with the specified budget and duration.

For users who prefer pre-defined travel arrangements, the platform offers a catalog of static trip packages stored in MongoDB. Each package includes a fixed itinerary with predefined destinations, schedules, and accommodation options. Seamless booking is facilitated through the integrated Razorpay payment gateway, ensuring a quick and secure transaction process.

Upon retrieving the user's current geographical location, the system delivers contextual and timely recommendations, including nearby attractions, suggested activities, and safety alerts. This feature dynamically adapts to the user's current surroundings, ensuring a safer and more enriching travel experience throughout the journey.

Once the user reviews the AI-generated itinerary or selects a static package, they proceed to confirm and complete their booking through the integrated payment gateway. Upon successful payment, the finalized travel plan is delivered to the user via their account portal, ensuring easy access and reference throughout the trip.

#### ***Proposed System***

TravelSphere is proposed as a comprehensive, AI-driven travel planning platform designed to overcome the limitations of conventional trip planning systems. The platform integrates three core functionalities — personalized itinerary generation, static trip packages, and real-time location-based recommendations — into a unified and user-friendly solution. At the heart of the system is the AI-powered itinerary generator, which leverages the Gemini API to analyze user-defined inputs such as destination, trip duration, budget, and group size. Based on this analysis, the system produces optimized day-by-day travel schedules accompanied by curated hotel recommendations, ensuring that every generated



plan is tailored to the individual traveler's preferences and expectations. For users who prefer structured, pre-defined travel experiences, TravelSphere offers a catalog of static trip packages stored in MongoDB. These packages include comprehensive itineraries with fixed destinations, schedules, and accommodation options, with seamless booking facilitated through the Razorpay payment gateway — providing a convenient and reliable alternative to fully customized planning. Additionally, the platform incorporates real-time location-based services that utilize the user's current geographical position to deliver timely activity recommendations, safety alerts, and nearby attraction suggestions. This dynamic capability ensures that recommendations remain contextually relevant and location-specific, significantly enhancing the overall travel experience.

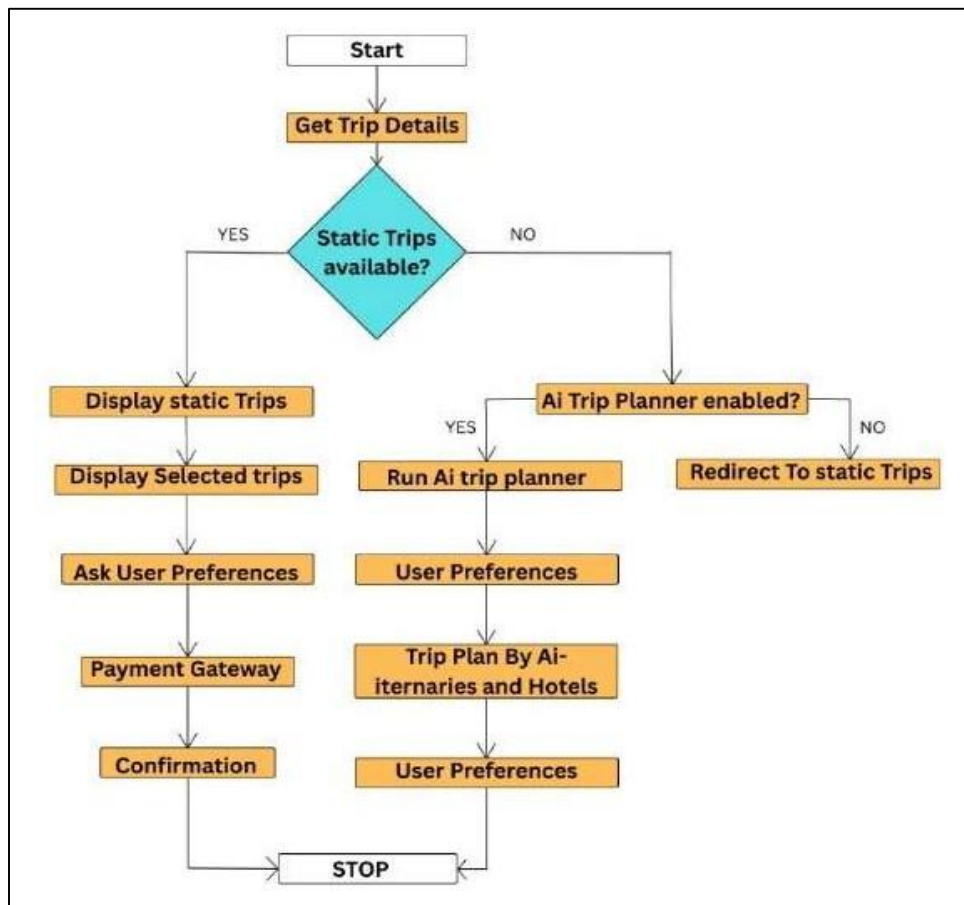


Fig 1: Flowchart

### System Architecture:

#### Static Trips – Traditional Manual Packages

The Static Trips module is made for people who like having travel plans that are already set and ready to go. These plans come with fixed schedules, so there's no need for someone to do research or use AI to plan the trip. Each package is put together by a person and includes chosen places to visit, hotels to stay at, and detailed daily plans. Users can look through the available packages, like a 3-day, 2-night trip to Goa, using the website or app. They just need to pick a package that fits their travel needs. Once they choose one, they give basic info, like their travel dates and how many people are going. Then, they pay through Razorpay. After the payment is done, the final plan and booking details are sent to the user via email or their account. This module doesn't use AI, so it's good for people who like things to be simple, predictable,



and reliable, like families or first-time travelers. The plans are set in stone, so there are no surprises. To make it easier, users can use discount codes during checkout, add extra services like guided tours or local transport, and leave reviews after the trip. All the feedback helps improve the static packages over time. Additionally, users can save their favorite static trip packages to a wishlist, making it easy to compare options and book them later when they're ready to travel.

#### ***AI Trips – Personalized Smart Planning***

The AI Trips module is the smartest and most flexible part of Travel Sphere. It uses AI and real-time data to create custom travel plans for each user. Users just need to provide some key information like the destination, how long the trip will be, their budget, how many people are going, and what kind of travelers they are (like solo, couple, family, or friends). The Gemini API then uses this info to suggest hotels, places to visit, and a daily plan. The system also checks the current weather and what's popular to make sure the suggestions are up to date. Each plan is made uniquely for the user, with options for hotels, transport, and budget tips. It also allows for last-minute changes, so users can adjust their plans quickly without needing a travel agent. This saves time and makes planning much easier. Additionally, users can save their AI-generated itineraries, edit them later, and regenerate the plan whenever their travel preferences or budget change. The module also provides personalized recommendations for local restaurants, shopping spots, and activities based on the user's interests, making the travel experience more enjoyable and tailored to their preferences.

#### ***Weather Forecast Integration – Real-Time Travel Safety***

The Weather Forecast Integration module keeps an eye on the weather at the places users are traveling to. It helps keep trips safe and reliable by giving up-to-date weather information. If there's a heavy rain, flood, or storm, the system sends alerts to users before or during their trip. How it responds depends on the type of trip. For trips made with AI, the system can change the destination or suggest safer routes. For static trips, it gives weather warnings and options to book again. This is especially useful during monsoon season or in areas like hills and coasts where weather can change suddenly. It's important for families and other groups that are more vulnerable to weather issues. Additionally, the module provides daily weather forecasts, temperature updates, and travel tips, helping users pack appropriately and plan their activities according to the expected weather conditions.

#### ***Trip History – Past Trips and User Records***

The Trip History module acts like a personal travel diary for each user. It keeps track of every trip that was created or booked, whether through AI or static packages. All past trips are saved in the user's account. They can log in anytime to see their old plans, bookings, and choices. There's a "Book Again" button that lets users quickly reuse past itineraries, making future trips faster and easier. The AI also looks at previous trips to give better and more tailored suggestions. This module helps with repeat trips or similar trips by making the process faster. It also allows users to share past itineraries with friends or family. Most importantly, it keeps all travel data safe, easy to access, and usable for future trips. It adds long-term value by creating a detailed travel history for each user.



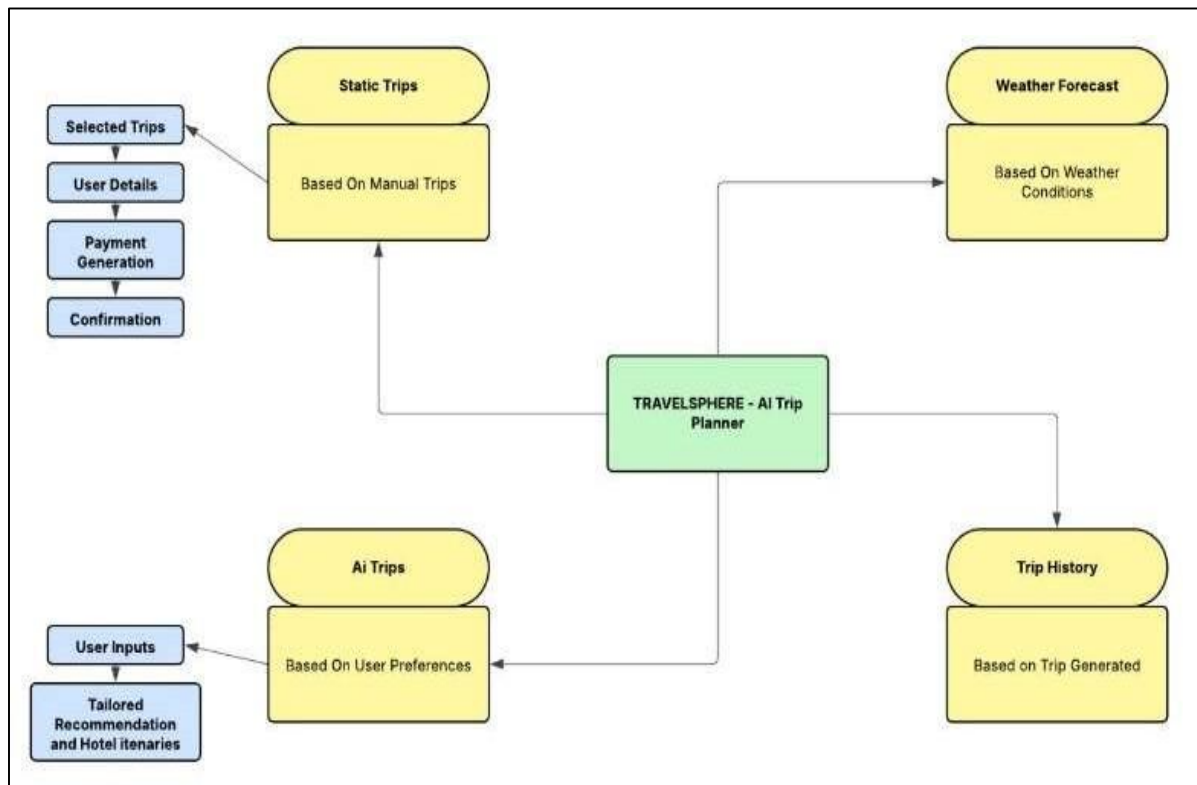


Fig 2: System Architecture Diagram

#### IV. RESULTS AND DISCUSSION



Fig 3: Home Page





Fig 4: Static Trips

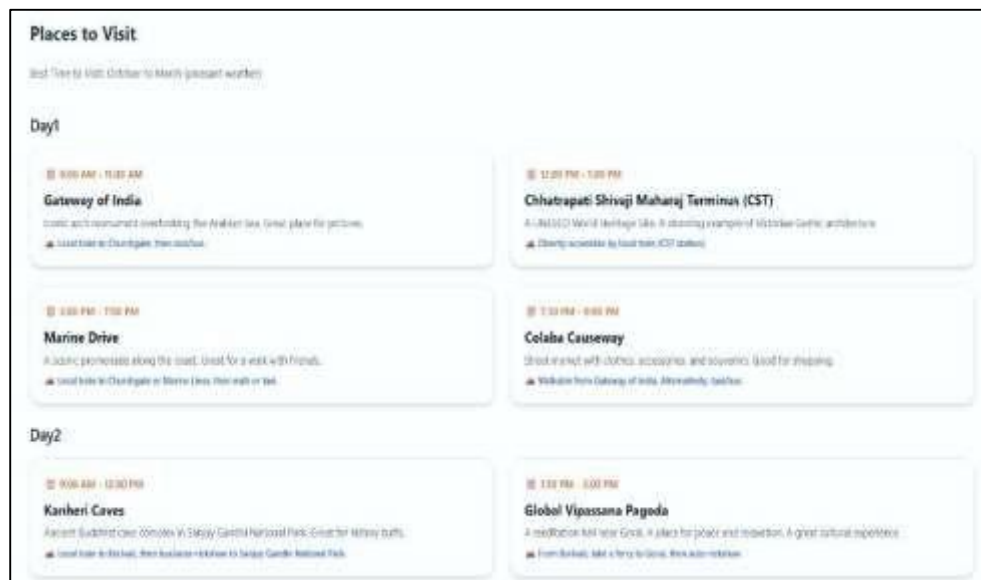


Fig 5: Places Suggestion





**Fig 6: Weather Alert**

## V. CONCLUSION

Travel Sphere effectively solves the problems of traditional travel planning systems by offering a full-featured, AI-based platform that meets the varied needs of today's travellers. It brings together three main features: AI-driven personalized trip planning, pre-set travel packages, and real-time suggestions based on location. This makes the travel planning process more adaptable, faster, and centered around the user. The use of important technologies like the Gemini API for smart itineraries, MongoDB for storing travel packages, and Razorpay for easy payments makes the platform dependable, safe, and strong in terms of technology. By factoring in user choices, up-to-date weather and environmental data, and existing travel options, Travel Sphere helps travelers make smart choices that improve their time, money, and overall trip experience. Looking forward, Travel Sphere has great potential for growth. Upcoming improvements include using more advanced AI tools, adding more travel destinations and activities, and possibly including flight bookings, visa help, and travel insurance. These upgrades will make Travel Sphere even more complete as a one-stop travel planning service, changing how people plan, book, and enjoy their trips. Additionally, TravelSphere is built with a scalable and modular architecture, making it easy to add new features, integrate third-party services, and support a growing number of users in the future.

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