International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 10 Issue: 04 | April - 2026 SJIF Rating: 8.659 ISSN: 2582-3930

TRIPSAGE: AI TRAVEL GUIDE – AN INTELLIGENT TRAVEL PLANNING APPLICATION

Ms. DEEPTHI NAIR P (MENTOR) [1]

PRAGELAN H[2], PRANESHWARAN A J[3], RAJESH R[4] , SABARI VASAN C S[5], SANDHIYA S[6]

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING,

SRI SHAKTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Abstract - TripSage is an AI-powered travel planning application designed to assist users in efficiently organizing their trips through intelligent automation. Users provide basic travel details such as destination, travel dates, and budget, and the system automatically generates a complete, structured, and personalized itinerary. Leveraging advanced Artificial Intelligence models including Google Gemini API, the application analyzes user preferences to suggest suitable attractions, accommodations, and daily schedules tailored to individual needs. The platform offers an interactive experience where users can modify plans, explore alternatives, and receive real-time guidance. Built using React.js, TypeScript, Tailwind CSS, and cloud-based data management, TripSage minimizes manual effort and enhances the overall travel planning process. The system integrates natural language processing capabilities to understand user intent and deliver context-aware travel recommendations. This approach makes trip organization faster, more accessible, and highly personalized for a wide range of users.

Key Words: Artificial Intelligence, Travel Planning, Itinerary Generation, Natural Language Processing, Recommendation System, Google Gemini API, React.js.

1.INTRODUCTION

In traditional travel planning, individuals rely on manually searching multiple sources such as websites and applications to gather information about destinations, accommodations, and activities, which requires considerable time and effort. This approach can be overwhelming for users, especially when comparing options, managing schedules, and organizing a complete trip plan, making the process slow and less efficient.

To simplify this process, TripSage an Artificial Intelligence (AI) powered travel planning system enables users to provide inputs such as destination, budget, and duration in a simple manner and automatically generates a structured and personalized itinerary. With the advancement of AI, particularly in recommendation systems and natural language processing (NLP), it is now possible to understand user preferences and convert them into meaningful travel plans. This transformation allows users to interact with the system more intuitively and receive optimized travel suggestions without the need for complex manual planning.

Objectives:

The system is designed to enable users to generate complete and well-structured travel itineraries by providing simple inputs such as destination, budget, and duration. It simplifies and speeds up the travel planning process by reducing the need for manual research through AI-based recommendations. The platform is built to be accessible to all users, including those with minimal experience, offering an intuitive and user-friendly interface that makes planning easy and efficient.

In addition, the system provides personalized recommendations for attractions, accommodations, and activities based on user preferences and travel constraints. It allows users to modify and refine their itineraries through interactive features and dynamic updates, ensuring flexibility in planning. Furthermore, it maintains a history of user inputs and generated itineraries, enabling users to revisit, reuse, and enhance their travel plans whenever needed.

2. LITERATURE SURVEY

2.1 Evolution of AI-Based Travel Planning Systems

Recent advancements in Artificial Intelligence have significantly improved the efficiency of travel planning systems. According to Li et al. (2022), AI-driven platforms are capable of automating itinerary generation by analyzing user inputs such as budget, preferences, and travel duration. These systems move beyond traditional search-based methods and provide intelligent, data-

driven travel plans, reducing manual effort and improving decision-making for travelers.

2.2 Growth of Personalized Recommendation Systems in Tourism

Personalization has become a key component in modern travel applications. Zhang et al. (2023) emphasized that machine learning-based recommendation systems can analyze user behavior and preferences to suggest customized destinations, accommodations, and activities. These systems enhance user satisfaction by delivering relevant and context-aware suggestions, making travel planning more efficient and user-centric.

2.3 Role of Conversational Interfaces in Travel Planning

Conversational interfaces have become an important component in modern AI-based travel applications. According to Sharma et al. (2024), chatbot-driven systems enable users to interact with travel platforms in a more natural and user-friendly manner. These systems can understand user queries, provide relevant suggestions, and assist in generating personalized travel plans through interactive communication, simplifying the overall planning process.

2.4 Automation and Smart Tourism Technologies

The concept of smart tourism has evolved with the integration of AI and cloud technologies. Chen et al. (2025) highlighted that modern travel systems can provide real-time recommendations, dynamic itinerary updates, and automated planning features. These systems improve efficiency and convenience; however, maintaining data accuracy and reliability remains a critical challenge to ensure user trust and system effectiveness.

3.EXISTING SYSTEM

The current travel planning process largely depends on manual research and fragmented digital tools, where users must gather information from multiple platforms such as websites, blogs, and booking applications. In this traditional approach, organizing a complete trip requires significant effort in searching, comparing, and managing various travel-related details.

Traditional travel planning methods often rely heavily on manual effort, where users independently search for destinations, accommodations, and activities across multiple websites, making the process both time-consuming and tedious. In addition, the planning experience is often fragmented, requiring users to switch between different platforms for bookings, reviews, maps, and schedules, which creates a disconnected workflow. Another key limitation is the lack of personalization, as most traditional systems provide generalized recommendations that may not align with individual user preferences, ultimately reducing overall satisfaction.

Furthermore, many existing platforms fail to offer real-time assistance or dynamic updates, which means users must manually re-plan their trips whenever unexpected changes occur. The process also involves repetitive decision-making, where users continuously compare hotels, check reviews, and organize daily itineraries. As a result, the overall travel planning experience becomes slow, inefficient, and sometimes overwhelming for users.

4. PROPOSED SYSTEM

The proposed system presents an AI-driven travel planning platform called TripSage, which transforms the traditional approach of trip organization into an automated and intelligent process. By leveraging Artificial Intelligence, the system interprets user inputs and generates personalized travel itineraries, bridging the gap between user requirements and efficient trip planning.

- **User-Centric Input Interface:** The system is designed with a simple and intuitive interface where users can provide travel details such as destination, budget, duration, and preferences in an easy and interactive manner.
- **AI-Based Itinerary Generation:** Advanced AI models analyze user inputs to generate well-structured travel plans, including daily schedules, recommended attractions, accommodation options, and estimated expenses.
- **Interactive Plan Refinement:** The platform supports continuous user interaction, allowing users to modify their travel plans, update preferences, and receive improved suggestions through real-time updates.
- **Data Storage and Management:** A cloud-based database system stores user details, travel histories, and generated itineraries, enabling easy retrieval and future modifications.
- **Automated Trip Structuring:** The system automatically organizes travel details into a complete and executable itinerary, eliminating the need for manual planning and reducing user effort significantly.

5. METHODOLOGY

5.1 Requirement Analysis and User Input

The process begins when the user provides travel-related details such as destination, budget, duration, and preferences through the application interface. This input is collected and forwarded to the AI processing layer for further analysis and interpretation.

5.2 Intent Understanding Using AI Models

The system utilizes the Google Gemini API to analyze the user's input and identify key requirements. The model processes the given information to determine user intent, such as preferred locations, type of activities, accommodation needs, and travel constraints.

5.3 Automated Itinerary Generation

Based on the identified intent, the system generates a structured and personalized travel plan. This includes daily schedules, recommended attractions, accommodation options, and estimated costs. The generated itinerary is designed to be efficient, organized, and aligned with user preferences.

5.4 Iterative Refinement and User Interaction

The methodology incorporates an interactive feedback mechanism where users can modify their travel plans. Users can update preferences, request changes, or explore alternative options, and the system dynamically adjusts the itinerary to provide improved and customized results.

6. SYSTEM REQUIREMENTS

6.1 Hardware Requirements

Component	Specification
Processor	Intel Core i5 or higher (or AMD equivalent)
RAM	8 GB minimum (16 GB recommended)
Hard Disk	256 GB SSD or higher
Internet	High-speed stable internet connection
Monitor	Standard HD Display (1920x1080)

Table 1: Hardware Requirement

6.2 Software Requirements

Component	Specification
Operating System	Windows 10/11, macOS, or Linux (Ubuntu 20.04 or later)
Programming Language	Node.js (LTS version) for React and Vite environments
Frontend Framework	React.js with TypeScript
Styling Framework	Tailwind CSS for responsive UI styling
AI Integration	Google Gemini API for Large Language Model capabilities

Table 2: Software Requirements

7. SYSTEM MODULES

The TripSage application is designed with a modular architecture encompassing the following key modules:

- **Sign Up Page:** Allows new users to register by providing basic credentials. The registration module validates user details and stores them securely in the cloud database.
- **Login Page:** Enables registered users to authenticate and access personalized features. The login module supports secure session management.
- **Home Page:** Serves as the main dashboard displaying featured destinations, quick access to itinerary generation, and navigation to other modules.
- **AI Trip Planner Page:** The core module where users provide travel inputs such as destination, budget, and duration. The AI engine processes inputs via the Google Gemini API and generates a structured itinerary.
- **My Trips Page:** Displays all previously generated and saved itineraries, allowing users to review, modify, or re-use past travel plans.
- **Hotel and Destination Page:** Provides detailed information about suggested hotels and destinations, including ratings, amenities, and location data.
- **Profile Page:** Allows users to manage their account details, view travel history, and update preferences for personalized recommendations.

8. OUTPUT

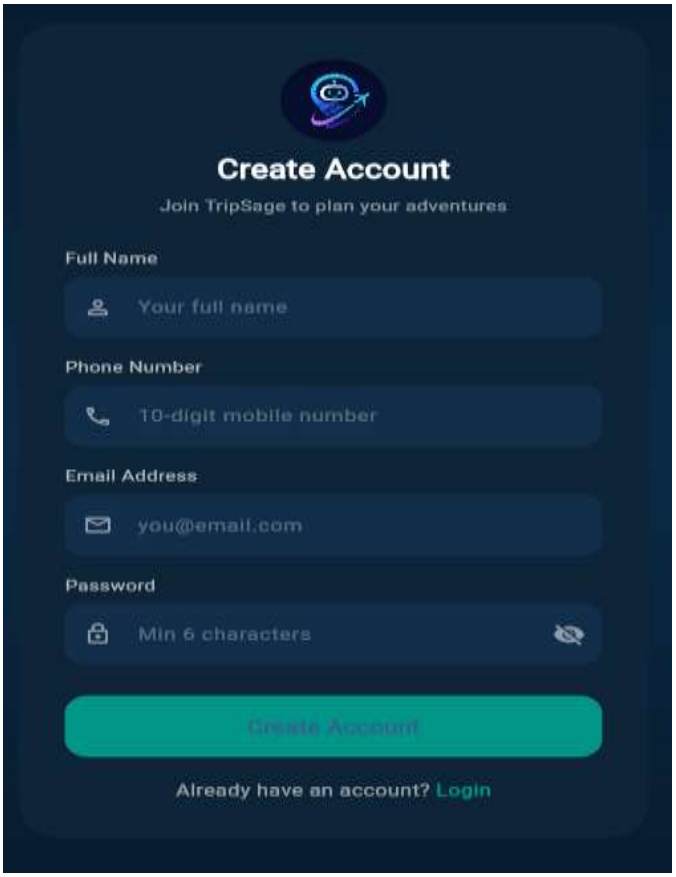

Figure 1.1 login page

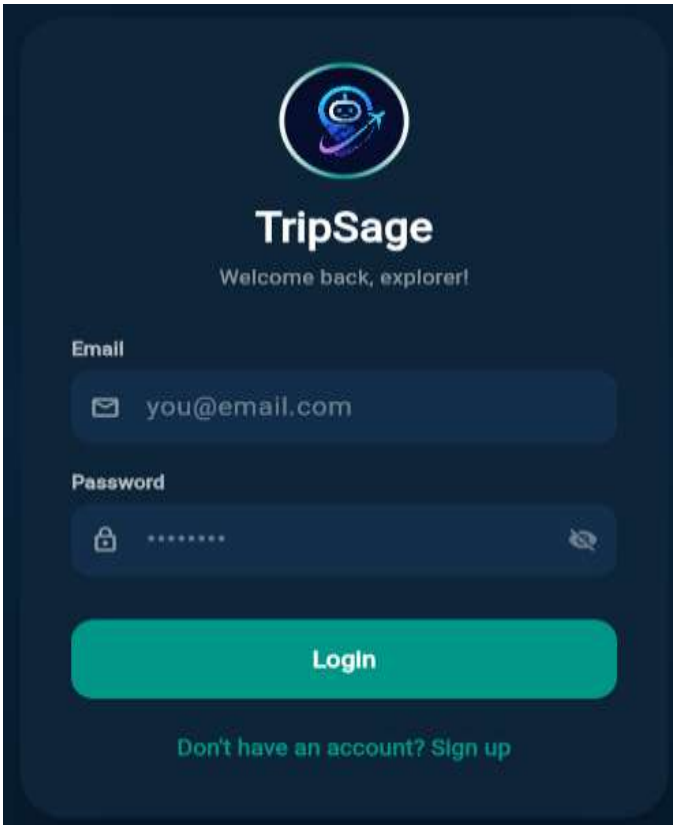

Figure 1.2 Sign-up Page

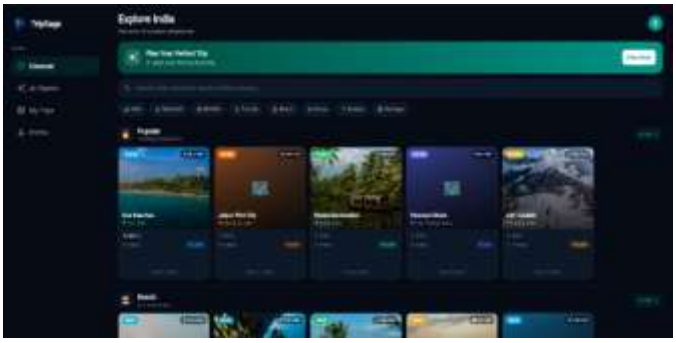

Figure 1.3 home page

Figure 1.4 AI planner page

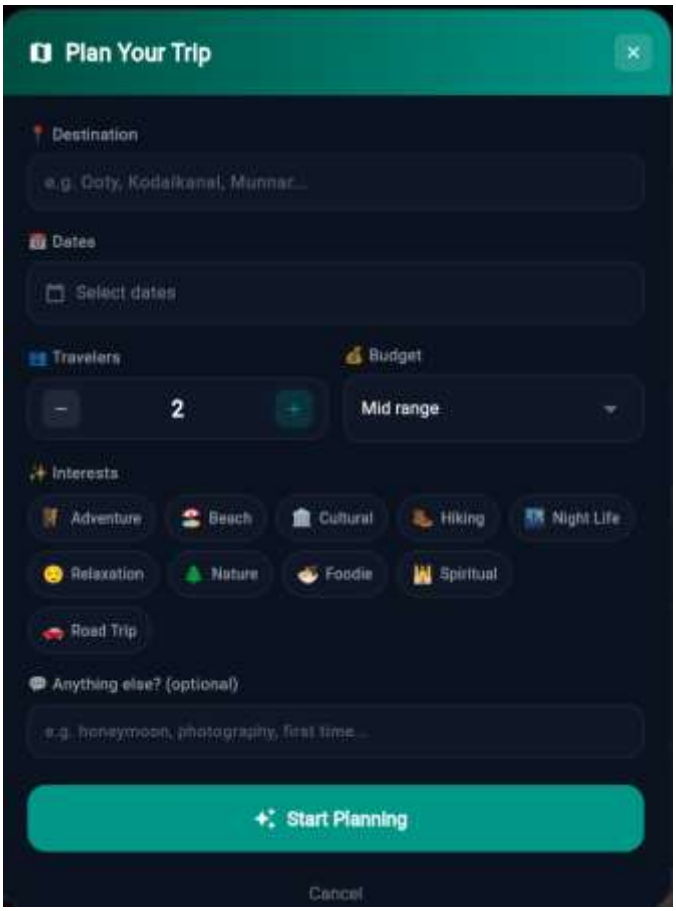

Figure 1.5 Trip-planner page

Figure 1.6 My-trip page

Figure 1.7 Profile page

Figure 1.8 Weather page

8. CONCLUSIONS

The TripSage AI Travel Guide project provides an intelligent and efficient solution for travel planning by utilizing Artificial Intelligence to generate personalized and well-structured itineraries based on user inputs. The system significantly reduces manual effort, saves time, and improves decision-making through smart recommendations and an easy-to-use interface. By leveraging the Google Gemini API for natural language understanding and React.js for a responsive frontend, the platform delivers a seamless user experience.

The system enhances user experience by simplifying complex planning tasks and making travel organization more accessible to all categories of users. Overall, TripSage offers a reliable and scalable approach to modern travel planning, with significant potential for future enhancements such as real-time flight and hotel booking integration, multi-language support, offline access, and advanced personalization features powered by deep learning algorithms.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the Department of Computer Science and Engineering, Sri Shakthi Institute of Engineering and Technology, Coimbatore, for providing the necessary resources and support throughout this project. Special thanks to the faculty mentors and peers who offered valuable guidance and suggestions during the development and documentation phases of this work.

REFERENCES

[1]Chen, X., et al. (2025). Smart Tourism Technologies: Real-Time Recommendations and Automated Planning with Cloud-Integrated AI Systems. *IEEE Transactions on Intelligent Systems*, 22(1), 78–94.

[2] Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart Tourism: Foundations and Developments. *Electronic Markets*, 25(3), 179–188.

[3] Huang, M. H., & Rust, R. T. (2021). Artificial Intelligence in Service. *Journal of Service Research*, 24(1), 3–10.

[4] Li, W., et al. (2022). AI-Driven Travel Planning Platforms: Automating Itinerary Generation Using User Preference Analysis. *Journal of Intelligent Tourism Systems*, 14(3), 45–58.

[5] Ricci, F., Rokach, L., & Shapira, B. (2015). *Recommender Systems Handbook* (2nd ed.). Springer.

[6] Sharma, R., & Verma, A. (2024). Conversational AI Interfaces for Smart Travel Planning: A User-Centric Approach. *Proceedings of the International Conference on AI and Web Technologies*, 201–215.
[7] Singh, P., et al. Integrated AI Coding Platforms for Rapid Development of Scalable Web Applications. *Journal of Software Engineering and Applications*, 9(4), 33–47.
[8] Tussyadiah, I. P. (2020). A Review of Research into Automation in Tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism. *Annals of Tourism Research*, 81, 102883.
[9] Xiang, Z., Schwartz, Z., Gerdes, J. H., & Uysal, M. (2015). What Can Big Data and Text Analytics Tell Us About Hotel Guest Experience? *International Journal of Hospitality Management*, 44, 120–130.
[10] Zhang, Y., & Liu, H. (2023). Machine Learning-Based Personalized Recommendation Systems in Tourism Applications. *International Journal of Information Management*, 18(2), 112–127.