iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** IV **Month of publication:** April 2026

DOI: https://doi.org/10.22214/ijraset.2026.81112

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue IV Apr 2026- Available at www.ijraset.com

Smart Tourist Guide

Vikas Kumar[1], Vyom Aditya Gupta[2], Er. Prabhat Kr. Yadav[3]
[1, 2]*Departmet of Infromation Technology (Shri Ramswaroop Memorial College of Engineering and Management), Dr. APJ Abdul Kalam University Mobile No: +91 9794773534*
[3]*Shri Ramswaroop Memorial College of Engineering and Management, Dr. APJ Abdul Kalam University*

Abstract: Smart urban mobility requires intelligent systems that assist travelers in efficiently exploring cities based on their preferences and time constraints. This paper presents Smart City Traveler, a web-based application designed to generate personalized travel itineraries by analyzing user interests and optimizing routes across selected locations. The system integrates multiple APIs, including Foursquare Places API for location discovery and recommendations, Google Maps Directions API for route optimization, and the Geometry Library for distance computation. Users provide inputs such as interests, available time, and current location, after which the system dynamically filters and ranks points of interest based on popularity, ratings, and proximity. The application then computes the shortest path connecting all selected destinations, ensuring minimal travel time and cost. Additionally, an interactive map interface enhances usability by visually presenting routes and locations, while automated email notifications provide users with their travel plans. The proposed system demonstrates how the integration of location-based services and real-time data can significantly improve travel planning, offering a scalable solution for smart city tourism and navigation.

I. INTRODUCTION

With the rapid growth of urbanization and the emergence of smart cities, the need for intelligent travel assistance systems has become increasingly important. Travelers visiting a new city often face challenges in identifying suitable places of interest, planning efficient routes, and managing their time effectively. Traditional methods of travel planning, such as guidebooks or static maps, lack personalization and real-time adaptability, making them less effective in today's dynamic environments.

In recent years, the integration of location-based services and web technologies has opened new possibilities for enhancing urban travel experiences. By leveraging real-time data, user preferences, and geographic information systems, modern applications can provide personalized recommendations and optimized navigation. However, many existing solutions focus either on place discovery or navigation independently, without offering a unified system that combines both functionalities in an intelligent and user- centric manner.

This paper introduces Smart City Traveler, a web- based application designed to assist users in planning their travel itineraries efficiently within a city. The system analyzes user inputs such as interests, available time, and current location to recommend relevant places and generate an optimized travel schedule. It utilizes external APIs, including Foursquare for venue recommendations and Google Maps services for route planning and visualization, to ensure accurate and up-to-date information.

The primary objective of this work is to develop a system that not only simplifies travel planning but also enhances user experience by providing personalized suggestions and the shortest possible routes between selected destinations. By integrating multiple technologies and employing efficient data processing techniques, the proposed system aims to reduce travel time, improve decision-making, and support the broader vision of smart city solutions.

II. LITERATURE REVIEW

A. Location-Based Services and Recommendation Systems

Location-Based Services (LBS) have become a fundamental component of modern travel and navigation systems. These systems utilize GPS, mobile networks, and web technologies to determine a user's real-time location and provide context-aware information [5], [6]. Research in this area emphasizes the importance of personalization, where user preferences, past behavior, and interests are analyzed to generate meaningful recommendations [2], [4].

Recommendation systems in tourism commonly rely on techniques such as collaborative filtering, content-based filtering, and hybrid approaches [2]. Platforms leveraging large-scale datasets, such as venue ratings, user reviews, and check-in histories, have significantly improved the quality of suggestions [5]. Studies show that incorporating user-generated data enhances accuracy and relevance, making travel planning more efficient [6]. However, many of these systems focus primarily on suggesting places rather than organizing them into a structured travel plan.

©IJRASET: All Rights are Reserved

B. Route Optimization and Navigation Techniques

Route optimization is a well-established research area that focuses on determining the most efficient path between multiple locations. Traditional algorithms such as Dijkstra's algorithm, A* search, and heuristic-based methods have been widely used to compute shortest paths in navigation systems [9]. Modern navigation platforms extend these approaches by considering additional parameters such as traffic conditions, travel time, and road constraints.

Recent research has explored multi-destination route planning, where users need to visit several locations within a limited time frame. Techniques such as the Traveling Salesman Problem (TSP) and its variants are often applied to optimize such routes [8]. While these approaches are effective in minimizing distance or time, they typically do not incorporate user preferences or contextual factors, limiting their applicability in personalized travel planning systems [1].

C. Integration of APIs and Smart Travel Systems

The integration of third-party APIs has significantly accelerated the development of intelligent travel applications. APIs such as location intelligence platforms and mapping services provide access to real-time data, including place details, user reviews, geographic coordinates, and routing information [1], [3]. Research highlights that combining multiple APIs enables developers to build scalable and feature- rich systems without the need for extensive data collection and maintenance.

Smart travel systems aim to unify recommendation engines with navigation services to provide a seamless user experience. These systems often include interactive dashboards, map visualizations, and automated notifications to enhance usability [10]. Despite these advancements, challenges remain in achieving efficient integration, handling dependency on external services, and ensuring system reliability. The proposed system builds upon these concepts by integrating recommendation services with route optimization and visualization tools, thereby offering a comprehensive solution for personalized travel planning. It addresses the limitations of existing approaches by combining user preference analysis, real-time data retrieval, and efficient path computation within a single platform.

III. PROBLEM STATEMENT

In the era of smart cities and digital transformation, travelers often face significant challenges when exploring a new city. Identifying suitable places of interest based on personal preferences, managing limited time effectively, and determining optimal routes between multiple destinations remain complex tasks [2], [9]. Existing solutions typically address these problems in isolation—navigation systems focus on route optimization, while recommendation platforms suggest popular places without considering travel efficiency or user- specific constraints. Moreover, traditional travel planning methods lack personalization, real-time adaptability, and integration of multiple services. Users are required to manually search for locations, evaluate options, and plan routes, which is time-consuming and often leads to inefficient travel decisions. Additionally, many systems do not provide a unified platform that combines user interest analysis, location-based recommendations, and shortest path computation in a seamless manner. Therefore, there is a need for an intelligent, integrated system that can automatically generate personalized travel itineraries by analyzing user preferences, available time, and current location. Such a system should efficiently recommend relevant places and compute the shortest possible route connecting them, thereby minimizing travel time and cost while enhancing the overall user experience.

IV. RESEARCH AIM

The primary aim of this research is to design and develop an intelligent web-based travel planning system that generates personalized city itineraries by analyzing user preferences, time constraints, and real-time location data. The study seeks to integrate location-based recommendation services with efficient route optimization techniques [1],
[4] to provide users with relevant places of interest and the shortest possible path connecting them.

Furthermore, the research aims to enhance urban travel experiences by combining multiple technologies, including external APIs, geographic information systems, and data-driven decision- making methods, into a unified platform. The system is intended to minimize travel time and cost while improving usability, accuracy, and overall efficiency in travel planning within smart city environments.

V. RESEARCH OBJECTIVES

1) To develop a web-based travel planning system that assists users in exploring a city efficiently based on their interests and preferences, addressing limitations in existing tourism recommendation systems [2], [4].
2) To analyze user inputs, such as interests, time availability, and current location, in order to generate personalized travel recommendations using techniques derived from location-based services and recommendation models [5], [6].

3) To integrate location-based services and external APIs for retrieving real-time information about places, including ratings, reviews, and geographic data, as supported by modern API-driven smart travel systems [1], [3].
4) To design and implement an efficient route optimization mechanism that determines the shortest path connecting multiple selected destinations by leveraging established routing and optimization techniques [8], [9].
5) To provide an interactive and user-friendly interface that displays recommended places and routes through map visualization, improving usability and user engagement in smart tourism applications [10].
6) To automate itinerary sharing, enabling users to receive their travel plans via email for convenience and future reference, enhancing system accessibility and practical usability.
7) To improve decision-making and reduce travel time and cost by combining recommendation systems with navigation and path optimization techniques, thereby creating a comprehensive and efficient travel planning solution [1], [9].

VI. PROPOSED SYSTEM OVERVIEW

The proposed system, *Smart City Traveler*, is a web-based application designed to provide an integrated solution for personalized travel planning within urban environments. The system combines user preference analysis, location-based services, and route optimization techniques to generate efficient and customized travel itineraries.

The system begins by collecting user inputs through a registration and login interface, followed by a questionnaire that captures user interests, such as preferred types of places (e.g., restaurants, temples, parks, shopping areas), along with available time and current location. The user's real-time location is obtained using GPS services, enabling the system to operate in a context-aware manner.

Once the input is gathered, the system communicates with external APIs to fetch relevant data. A location intelligence API is used to retrieve nearby places based on user preferences, providing details such as ratings, reviews, and categories. These places are then filtered and ranked to ensure that only the most relevant and highly rated options are considered.

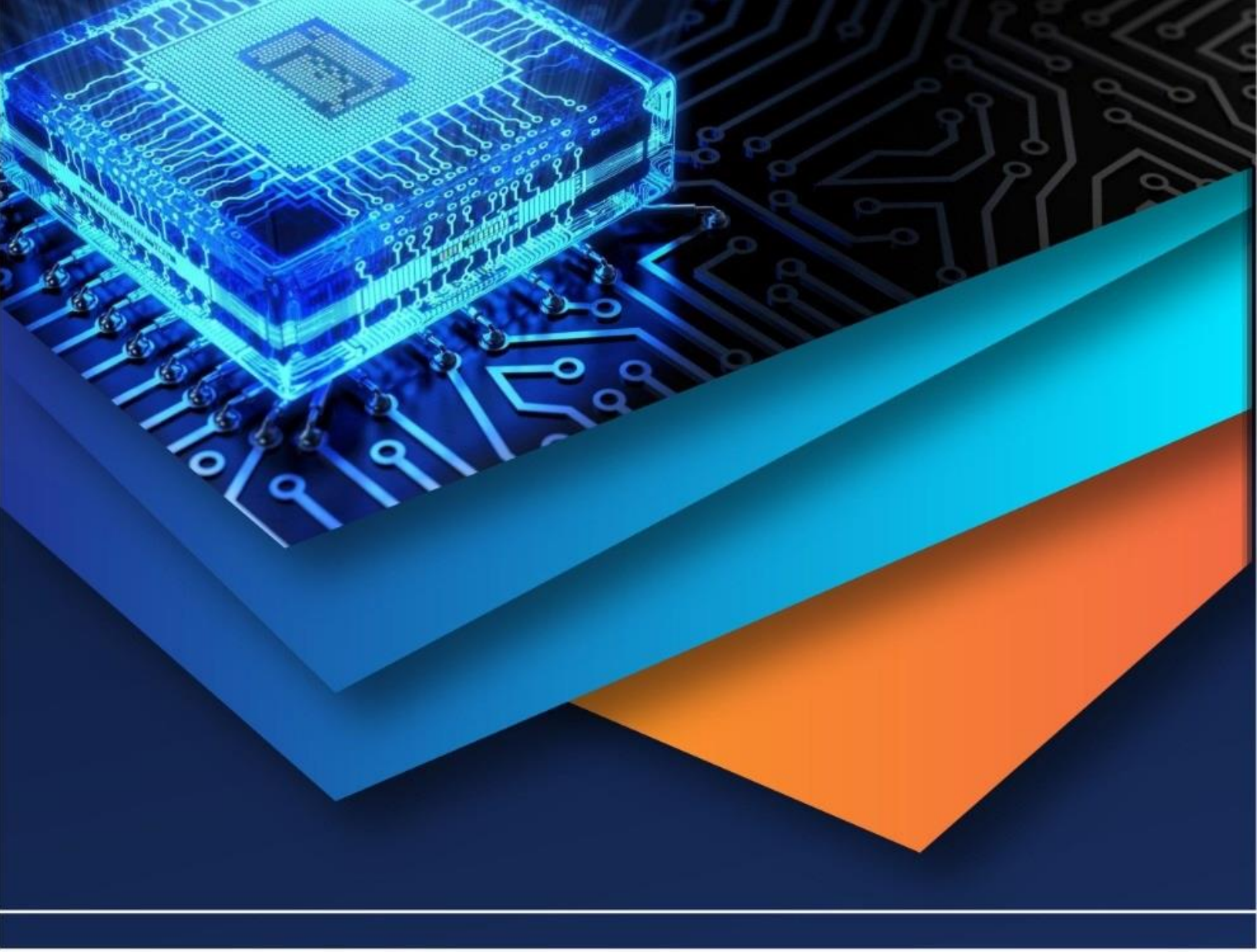
After identifying suitable locations, the system applies route optimization techniques to determine the shortest path connecting all selected destinations. This process considers geographic coordinates and distances between locations to minimize travel time and cost. The optimized route is then visualized on an interactive map interface, where users can view all recommended places as markers and understand the sequence of travel.

Additionally, the system enhances user experience by offering features such as a dashboard for managing travel plans and automated email notifications that provide a summary of the generated itinerary. The modular design of the system ensures scalability, maintainability, and efficient integration of multiple technologies.

Overall, the proposed system delivers a unified platform that bridges the gap between recommendation systems and navigation tools, enabling users to explore cities in a smarter, faster, and more personalized way.

REFERENCES

[1] Mehmood, F., Ahmad, S., & Kim, D. (2019). "Design and Development of a Real- Time Optimal Route Recommendation System Using Big Data for Tourists in Jeju Island." Electronics, 8(5), 506. Focuses on building a travel route recommendation system using real-time tourist data and user preferences.
[2] Singh, A., Kumar, A., Sharma, A., & Katarya, R. (2022). "A Systematic Survey of Tourism Recommender System Techniques and Challenges." Journal of IoT in Social, Mobile, Analytics, and Cloud. Reviews modern techniques like machine learning and deep learning in tourism recommendation systems.
[3] Luo, L. (2025). "RARE: Right Algorithm for the Right Errand; A Multi-Model Machine Learning-Based Approach for Tourism Routes and Spots Recommendation." PeerJ Computer Science. Proposes a machine learning–based system for personalized tourist route and place recommendations.
[4] Jing Lu (2022). "Personalized Recommendation Algorithm of Smart Tourism Based on Cross-Media Big Data and Neural Network." Computational Intelligence and Neuroscience. Uses neural networks and big data for smart tourism recommendation systems.
[5] Zhao, S., King, I., & Lyu, M. (2016). "A Survey of Point-of-Interest Recommendation in Location-Based Social Networks." Provides a comprehensive overview of POI recommendation techniques using location-based data.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)