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Smart Travel Companion: AI-Driven Trip Planning Mobile Application

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Abstract: *This research presents the development of a React Native-based trip-planning mobile application that integrates AI-driven recommendations, Firebase authentication, and real-time itinerary management to enhance the travel planning experience. The application provides users with a seamless and interactive platform to generate personalized trips based on their preferences, including destination, budget constraints, traveler type, and trip duration. A key innovation in this system is its ability to dynamically generate itineraries using AI, allowing users to explore optimized travel plans that suit their specific needs.*

To ensure a secure and efficient user experience, the app incorporates Firebase authentication for account management and Firestore for real-time data storage and retrieval. Users can create, save, and modify itineraries while receiving real-time updates on trip details. Additionally, the Expo Router framework is utilized to provide smooth navigation between different sections of the app, enhancing usability.

The application also features budget-based trip planning, enabling users to choose between cost-effective, moderate, and luxury travel options. A real-time review and modification system allows users to customize their itineraries on the go, ensuring flexibility and adaptability. Furthermore, integration with external APIs provides location-based recommendations, assisting users in discovering attractions, accommodations, and transport options.

This study explores the technical challenges faced during development, including AI implementation, performance optimization for mobile platforms, and data synchronization using Firebase. The findings highlight the potential of AI-driven mobile applications in revolutionizing the travel industry, paving the way for more intelligent and adaptive travel planning solutions. Future improvements will focus on enhanced AI recommendation models, deeper integration with travel APIs, and improved real-time collaboration features for group travel planning.

Keywords: AI-Powered Travel Planning, Firebase Authentication, React Native, Expo Router, Itinerary Generation, User Personalization

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