RIDEEASE - A MULTI MODAL RIDE BOOKING PLATFORM

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Introduction:

1. Urban transportation systems are increasingly complex due to rapid urbanization and fragmented transport services. Existing ride-booking platforms such as Ola and Uber provide only single-mode transportation, which limits their ability to support complete journeys involving multiple transport modes.
2. Commuters often rely on combinations of bikes, autos, cabs, and metro services, leading to inefficiencies, increased travel time, and higher costs. Current systems lack integration and do not effectively address first-to-last mile connectivity.
3. RideEase is proposed as a multi-modal ride booking platform that integrates multiple transportation modes into a single system. It enables users to plan end-to-end journeys by dividing trips into multiple segments and providing route, time, and cost estimation.
4. The system uses Google Maps and Distance Matrix APIs to provide accurate travel information. This project aligns with Intelligent Transportation Systems (ITS) and Mobility-as-a-Service (MaaS), aiming to improve travel efficiency and user convenience.

Objectives:

1. To develop a multi-modal ride booking system integrating various transport modes.
2. To enable multi-leg journey planning in a single platform.
3. To implement real-time distance, duration, and fare estimation.
4. To improve first-to-last mile connectivity and user convenience.

Methodology:

1. The system follows a modular full-stack approach. Initially, existing ride-booking systems are analysed to identify limitations in multi-modal integration. Based on this, a layered architecture is designed.

2. The frontend is developed using React Native (Expo), providing user input forms for trip planning and route visualization. The backend is implemented using Node.js and Express to handle API requests, fare calculation, and system logic.
3. Google Maps API and Distance Matrix API are integrated to compute real-time distance and duration. MongoDB is used for storing user data, trip details, and ride history.
4. The system allows users to divide journeys into multiple segments (e.g., bike → metro → cab) and generates total cost and time estimation.
5. Testing is conducted to validate system performance, route accuracy, and user interface responsiveness. The system is deployed in a mobile testing environment and designed to be scalable for future enhancements.

Result and Conclusion:

1. The RideEase system successfully demonstrates a working prototype of a multi-modal ride booking platform. It enables users to plan complete journeys using multiple transport modes within a single interface.
2. The system provides accurate estimations of distance, duration, and cost using real-time API integration. It simplifies travel planning and improves user convenience compared to traditional single-mode systems.
3. Testing shows that the platform effectively reduces travel complexity and enhances decision-making. The interface is user-friendly and supports efficient navigation between ride segments.
4. In conclusion, RideEase provides a practical solution for urban mobility challenges and serves as a foundation for future intelligent transportation systems.

Project Outcomes and Learnings:

- Full-stack mobile app development
- API integration and system design
- Understanding of smart mobility systems

References:

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- H. H. B. M. Yusof and S. M. S. F. Abidin, “Impacts of ride-hailing services on public transport: A review of the literature,” in Proc. IEEE Symp. Eng., Technol. Sci. (ISETS), 2021, pp. 1-6.

Future Scope:

The future scope of this project includes:

1. Future improvements include integration with real-time ride APIs (Uber, Ola), AI-based route optimization, live tracking, and payment gateway integration.

2. The system can be expanded to include public transport data, cloud deployment, and analytics dashboards.
3. It can also support smart city infrastructure and large-scale urban mobility solutions.

Snapshots: