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RideMate: A Smart Ride-Sharing and Cost-Sharing Platform

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ABSTRACT

RideMate is a smart ride-sharing and cost-sharing platform designed to connect people travelling to the same or similar destinations. The main objective of this project is to make transportation more affordable, convenient, and efficient by enabling users to share rides and divide travel expenses. Conventional transportation services may require individuals to book separate rides, which can increase their travel costs. RideMate is developed using React.js for the frontend and Java Spring Boot for the backend. React.js provides an interactive and responsive user interface, while Spring Boot manages server-side operations and business logic. The system follows a structured architecture to handle user requests and ride-related activities efficiently. The database technology is used to store and manage the information required by the application. In conclusion, RideMate offers a practical approach to shared transportation by connecting people with compatible travel plans and encouraging cost-sharing. The platform aims to reduce individual travel expenses, improve vehicle utilization, and provide a convenient travel experience. Future enhancements may include advanced route matching, real-time location tracking, secure online payments, and additional safety features to improve the functionality and reliability of the system.

Keywords: Ride-Sharing, Cost-Sharing, Carpooling, React.js, Java Spring Boot, Web Application, Shared Transportation.

1. Introduction

Transportation plays an important role in daily life by enabling people to travel to educational institutions, workplaces, and other destinations. However, travelling individually can increase transportation expenses, particularly when multiple people travel to the same or similar destinations using separate vehicles. The growing demand for affordable and convenient transportation has created opportunities for ride-sharing platforms that connect people with compatible travel plans. RideMate is a smart ride-sharing and cost-sharing platform designed to connect individuals travelling to the same or similar destinations. The primary objective of the system is to simplify the process of finding travel companions and enable users to share transportation expenses. By helping users discover suitable rides and coordinate their journeys, RideMate aims to reduce individual travel costs and improve the utilization of available vehicle capacity. The application is developed using React.js for the frontend and Java Spring Boot for the backend. React.js provides an interactive user interface, while Spring Boot manages server-side processing and application business logic. Through this combination of technologies, RideMate provides a web-based approach to shared transportation that emphasizes affordability, convenience, and efficient coordination among travellers.

1. Literature Review

Ride-sharing and carpooling have received considerable attention as approaches to improving transportation efficiency and reducing individual travel expenses. Existing research has explored the challenges of matching passengers with drivers, coordinating travel routes, and satisfying the requirements of multiple users within a shared transportation system. Ride-sharing and carpooling have received considerable attention as approaches to improving transportation efficiency and reducing individual travel expenses. Existing research has examined the challenges of matching passengers with drivers, coordinating travel routes, and accommodating the requirements of multiple users within a shared transportation system.

Xia et al. (2015) investigated carpool matching and proposed a model for identifying suitable participants for shared journeys, highlighting the importance of matching travel requirements when developing carpooling systems.

Aydin et al. (2020) examined ride-sharing matching algorithms that consider route splits and social factors, demonstrating the relevance of route compatibility and passenger preferences in shared transportation. These studies provide useful background for understanding the design of ride-sharing platforms. In web application development, React.js supports the creation of interactive user interfaces through reusable components, while Java Spring Boot provides a framework for developing backend services and application logic. RideMate applies these general concepts to a web-based platform intended to connect individuals travelling to the same or similar destinations and facilitate the sharing of travel expenses. The effectiveness of the platform depends on its implemented ride-discovery, matching, and coordination feature.

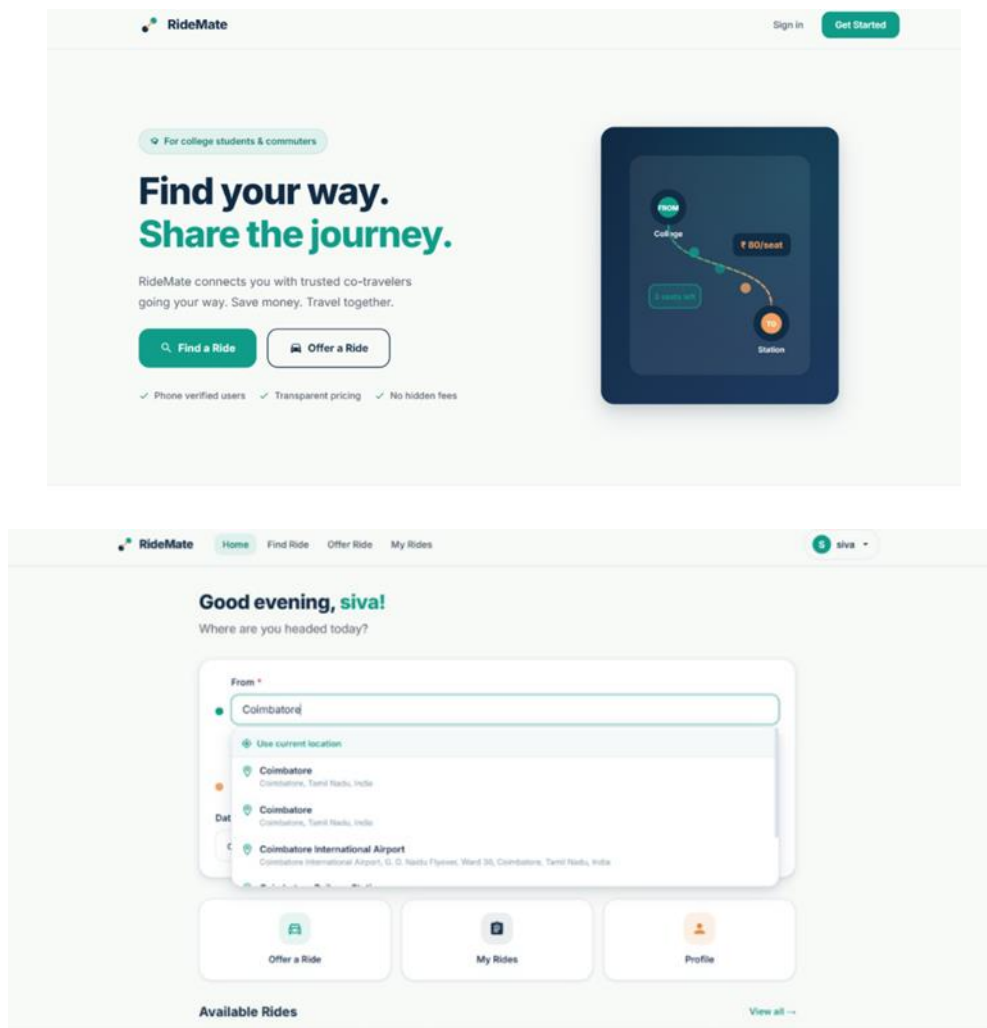


Fig. 1 – Home Page's

Methodology / System Design

The RideMate platform follows a structured software development methodology consisting of requirement analysis, system design, implementation, testing, and deployment. During requirement analysis, the primary objective is defined as connecting people with compatible travel plans and facilitating the sharing of transportation expenses. The system design phase establishes the application architecture and the interaction between its components. RideMate uses a client-server architecture in which React.js provides the frontend interface and Java Spring Boot handles backend processing and business logic. The frontend enables users to interact with the application's available features, while the backend processes requests and communicates with the data storage layer. The database stores the information required for the application's operations according to the implemented data model. The development process focuses on usability, maintainability, responsiveness, and reliable request processing. The system workflow follows the operations supported by the implemented application, allowing users to access ride-related information and coordinate travel arrangements through the available functionality.

Implementation and Features

RideMate is implemented using React.js for frontend development and Java Spring Boot for backend development. The frontend provides the user interface and manages user interactions, while the backend processes application requests and executes the required business logic. React.js supports the development of reusable interface components, helping maintain consistency across the application. Java Spring Boot organizes backend operations and provides the services required to process requests and interact with the data storage layer. Communication between the frontend and backend enables information to be exchanged during application operations. The central concept of RideMate is to connect people travelling to the same or similar destinations so that they can coordinate their journeys and share transportation expenses. The application is designed to simplify ride-related interactions through a structured web interface. The specific modules and features described in this section should correspond to the functionality implemented in the completed application.

Results and discussion

The RideMate project demonstrates the development of a web-based ride-sharing and cost-sharing platform using React.js and Java Spring Boot. The application provides an interface for users to interact with its implemented ride-related functionality and supports the coordination of shared travel arrangements. The separation of frontend and backend responsibilities provides a structured approach to user interaction, request processing, and data management. The project addresses the practical objective of helping travellers discover compatible transportation opportunities and share travel expenses. The system should be evaluated through functional testing of the implemented modules, including input validation, ride-related operations, data processing, and communication between the frontend and backend, where applicable. Actual test cases, observed outcomes, and relevant application screenshots can be used to demonstrate the system's functionality. Claims regarding cost reduction, matching accuracy, or performance improvements should be supported by measured results rather than assumptions.

Conclusion

RideMate presents a web-based approach to ride-sharing and cost-sharing by connecting individuals travelling to the same or similar destinations. The project aims to make shared transportation more convenient and affordable by helping travellers identify compatible journeys and coordinate travel arrangements. The application uses React.js for frontend development and Java Spring Boot for backend processing, providing a structured architecture for user interaction and application logic. RideMate demonstrates how modern web technologies can be applied to a transportation-related problem with an emphasis on shared travel and expense allocation. Future enhancements may include advanced route matching, real-time location tracking, online payment integration, user verification, trip ratings, and emergency assistance features. Further testing with real travel scenarios could help evaluate the usability, reliability, and practical benefits of the platform.

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