PROJECT REPORT

On

Carax-A Ride- Sharing Application

Submitted in partial fulfilment of the requirement
for the
Course BEE (22CS026)
of
COMPUTER SCIENCE AND ENGINEERING
B.E. Batch-2022

in

Jan -2025

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Under the Guidance of Name
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CERTIFICATE

This is to certify that the project entitled 'Carax – A Ride-Sharing Application' has been submitted for the Bachelor of Computer Science Engineering at Chitkara University, Punjab during the academic semester January 2024 – May-2024. It is a bonafide piece of project work carried out by: Krishna Kandelwal (2210991813)Madhav Sharma (2210991862)Lovish Garg (2210991858)Keshav Singla (2210991786)Keshav Yogi (2210991788)towards the partial fulfillment for the award of the course Integrated Project (CS 203) under the guidance of Rahul Singh Rajput

Sign. of Project Guide

Rahul Singh Rajput

CANDIDATE'S DECLARATION

We, the undersigned, hereby declare that the Integrated Project Report entitled 'Carax – A Ride-Sharing Application' is an original work and the data provided in the study is authentic to the best of our knowledge. This report has not been submitted to any other institute for the award of any other course.

Signatures:

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ACKNOWLEDGEMENT

We express our sincere gratitude to Rahul Singh Rajput for the support, cooperation, and motivation provided during the project. His guidance and valuable suggestions played a crucial role in our learning process. We also extend our sincere appreciation to our parents, friends, and team members for their continuous support and encouragement.

TABLE OF CONTENTS

Carax is a ride-sharing application designed to connect riders with nearby drivers, providing a seamless and cost-effective transportation experience. The app features real-time tracking, secure payments, an intuitive user interface, and dynamic pricing. The goal of Carax is to offer a reliable alternative to traditional taxis and existing ride-hailing services by focusing on affordability, driver incentives, and user safety.

Keywords: Ride-sharing, transportation, real-time tracking, mobile application, Carax.

2.1 Background

Ride-sharing services have revolutionized urban transportation by providing flexible and cost-effective solutions. Companies like Uber and Lyft have set high industry standards, but challenges such as surge pricing, driver dissatisfaction, and inconsistent service still exist. Carax aims to improve on these aspects by offering fair pricing, driver-friendly policies, and an enhanced user experience.

2.2 Problem Statement

Despite the success of ride-sharing platforms, users still face issues such as unpredictable fare increases, long wait times, and limited availability in semi-urban areas. Carax addresses these concerns by using AI-driven ride allocation, transparent fare calculations, and an incentive-driven model for drivers.

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3. Software and Hardware Requirement Specification

3.1 Methods

• Agile Development Methodology• Mobile-first approach• Cloud-based architecture

3.2 Programming/Working Environment

• Frontend: React Native• Backend: Node.js with Express.js• Database: MongoDB• Hosting: AWS/GCP

3.3 Requirements to Run the Application

• Internet connection• Android/iOS device• Minimum 2GB RAM

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4. Database Analysis, Design, and Implementation

The database design includes:

• User authentication system• Ride request and allocation model

• Payment and transaction logs The database is implemented using MongoDB, which provides scalability and flexibility in managing ride data and user information.

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5. Program's Structure Analysis and GUI Constructing (Project Snapshots)

The application is structured with the following components:

• Home Screen: Interface for ride requests

• Live Tracking: Map-based user interface displaying real-time ride status

• Driver Dashboard: Interface showing ride details, earnings, and performance metrics

• User Profile: Management of user and driver profiles, ratings, and reviews

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6. Code Implementation and Database Connections

6.1 API Structure

The backend follows a RESTful API architecture secured with JWT authentication. Key API endpoints include:

6.1.1 Authentication API

• POST /api/auth/register – Register a new user

• POST /api/auth/login – Log in an existing user and return a JWT token

6.1.2 Ride Management API

• POST /api/rides/request – Request a ride

• POST /api/rides/accept/:rideId – Accept a ride request

• POST /api/rides/start/:rideId – Start a ride

• POST /api/rides/end/:rideId – End a ride and calculate fare

• GET /api/rides/history/:userId – Retrieve ride history

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7. System Testing

• Unit Testing: Testing individual APIs and database queries• Load Testing: Ensuring the system can handle multiple ride requests simultaneously• Security Testing: Verifying data privacy and secure transactions

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8. Limitations

• Requires a stable internet connection• Limited availability in rural areas• High competition in the ride-sharing market may impact initial adoption

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9. Conclusion

Carax offers a cost-effective, user-friendly ride-sharing platform that ensures better driver incentives, fair pricing, and enhanced security. It addresses current market challenges and provides a scalable solution for urban transportation.

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10. Future Scope

Future enhancements for Carax include:1. AI-Based Dynamic Pricing – Implement real-time fare adjustments based on demand.2. EV Integration – Partner with electric vehicle providers to promote sustainable transportation.3. Autonomous Vehicle Compatibility – Prepare for integration with self-driving technology.4. Carpooling & Ride-Sharing – Introduce features for shared rides to reduce congestion and costs.5. Blockchain-Based Payments – Enhance security with decentralized payment processing.6. Voice-Based Booking – Incorporate AI-powered voice commands for booking rides.7. Multilingual Support – Expand usability to regional markets with multiple language options.8. Subscription & Loyalty Programs – Offer rewards and discounts for frequent users.

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