

Version [1.0]



Carpooling System

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1. Introduction

The **Carpooling System** will provide a platform that allows users (drivers and passengers) to find each other and share rides. The document will help the development team understand what the system needs to do, how it should behave, and the standards it must meet.

1.1 Purpose

The purpose of this document is to clearly define the goals, features, and requirements of the Carpooling System. It is meant for the development team, business stakeholders, and anyone involved in the project. The document will be used to guide the development process and ensure everyone is on the same page about what the system is meant to do and how it should perform.

1.2 Scope

This Carpooling System will provide an easy-to-use platform for users (drivers and passengers) to share rides. The main functionalities include user registration, ride matching, user verification, real-time tracking, and payment integration. The system will also include safety and trust-building features such as ratings and feedback. It will not provide vehicles or manage insurance.

2. High Level Description

This section provides an overview of the Carpooling System without getting into technical details. The goal is to explain what the system does in a simple and clear way.

2.1 Product Functions

The Carpooling System will offer the following main features:

1. **User Registration:** Users can sign up and create accounts as either drivers or passengers.
2. **Ride Matching:** Passengers can find available drivers nearby who are traveling in the same direction
3. **Real-Time Tracking:** Both drivers and passengers can track the ride in real-time for safety and transparency.
4. **Payment Integration:** The system will allow passengers to pay drivers through a secure payment system.
5. **Rating and Reviews:** After the ride, passengers and drivers can rate each other to help improve the experience.

2.2 System Constraints

1. The system should work on mobile devices, supporting both **Android** and **iOS** platforms.
2. The system will not provide vehicles or manage vehicle insurance.
3. It will need internet access to track rides and process payments.

2.3 Assumptions and Dependencies

This section should list all factors that may have an effect on the requirements defined in this specification.

1. *The system will be developed for Android and iOS mobile platforms using existing technologies like React Native for cross-platform support.*
2. *The application assumes availability of internet access and smartphones for all users.*
3. *The system will rely on third-party services for payment processing and maps (Google Maps, Easy-paisa and Online Banking).*

3. Specific Requirements

This section lists all the detailed requirements for the **Carpooling System**. These requirements describe what the system must do to meet the needs of the users and business goals.

3.1 Integration Requirements

3.1.1 User Interfaces

- The system should allow integration with other applications for user authentication via social media accounts like Google or Facebook.
- Ride details and payment history must be accessible through user-friendly web and mobile interfaces.

3.1.2 Software Interfaces

- Integration with payment gateways (Easy-Paisa and Online Banking) for in-app transactions.
- Google Maps API for ride route mapping and tracking.

3.1.3 Communications Interfaces

- Push notifications for ride updates, booking confirmations, and system alerts.
- Email notifications for important actions like ride cancellations or payment receipts.

3.2 Functional Requirements

3.2.1 Business Rules

- Users must be over 18 years of age to register as a driver.
- Ride requests are only valid for routes within the city's limits, except in special cases.
- Drivers must maintain a valid driving license and insurance before being allowed to provide rides.

3.2.2 Transactions, Adjustments

- Payment transactions will be processed immediately after ride completion. Adjustments can be made if a payment dispute occurs.

3.2.3 Security Access, Protection

- All sensitive user data, including payment information, must be encrypted.
- Users should authenticate using either a password or a multi-factor authentication (MFA) system.
- Rating and review mechanisms must be protected against abuse (fake ratings).

3.2.4 Data Capture, Transformation

- The system will capture the user's name, email, phone number, ride history, payment information, and ratings.
- Data transformations will include ride cost calculations and real-time updates.

3.2.5 Performance, monitoring and reporting

- The system should handle 10,000 concurrent users during peak times without performance degradation.
- The app must provide monthly usage reports to admins, including popular routes, user ratings, and system performance metrics.

3.2.6 External Interactions

- Integration with Google Maps for routing and location data.
- Integration with a third-party payment gateway (Easy-Paisa and Online Banking) for processing payments.

3.2.7 Legal, Environmental, Regulatory constraints

- The system must comply with privacy laws.

3.5 Non-Functional Requirements

3.5.1 Performance

- The system should load pages within 2 seconds and respond to user actions in under 500 milliseconds.
- It should be able to handle 10,000 users concurrently, with a peak load during rush hours.

3.5.2 Reliability

- The system should maintain 99.9% uptime. Any downtime due to system failure must be resolved within 12 hours.

3.5.3 Availability

- The system must be available 24/7, except during scheduled maintenance.

3.5.4 Security

- Passwords and payment data must be encrypted with the latest encryption standards.
- User authentication will be required for every session and before performing actions like booking or payments.

3.5.5 Maintainability

- The system should allow for automatic updates to improve functionality and security.
- Admins should be able to perform regular maintenance tasks like monitoring user activity and ensuring smooth system operation.

4. Change Management Process

- **Who requested the change:** Any stakeholder.
- **When was it requested:** Time of change request.
- **Reason for the change:** Improvements in user experience, security updates, or changes in business goals.
- **Consequences:** Re-evaluation of project scope, cost, or timelines.
- **Versioning:** A new version of the SRS will be created with every major change.

A. Appendices

Appendices can be used to provide additional information.

A.1 Appendix 1

A.1 Appendix 1: Glossary

- **Carpooling:** Sharing a ride with others to reduce cost and environmental impact.

A.2 Appendix 2

A.2 Appendix 2: Stakeholder List

- **Commuters:** Potential users who seek affordable, convenient travel.
- **Drivers:** Individuals who offer rides in exchange for fuel cost savings.

App Owners: Organizations responsible for managing the platform.

5. Use Case Diagram

