Shuttle App Project - Software Requirements Specification (SRS) Draft

1. Introduction

The Shuttle App aims to streamline the daily transportation of school and college students in India. It is designed to improve communication between students, drivers, and parents, ensuring a safe and efficient transport experience. Starting as a web application, it will eventually be extended to Android. The app provides real-time tracking, notifications, and data management for both drivers and students.

2. Purpose

The app will address common challenges such as students missing buses, drivers waiting unnecessarily, and parents' concerns about the safety of their children. By using live location tracking and QR-based boarding confirmation, the app offers peace of mind to parents and convenience for both students and drivers.

3. Features

3.1 Student Features

- View Bus Details: Students can access the bus name, number, driver’s contact, and an image of their assigned bus.

- Live Location Tracking: Every day, students can track the real-time location of their bus to ensure they don’t miss it.

- Attendance Notification: Students can notify the app if they will not be traveling on a particular day, which informs the driver to skip that stop.

- QR-based Boarding (For School Students): Students below grade 10 will carry a bus card with a QR code. Upon scanning, a notification with live bus location is sent to parents to confirm boarding.

3.2 Driver Features

- Student List: Drivers will have access to a list of students assigned to their bus each day, including whether they have marked themselves absent.

- Real-Time Student Updates: Drivers can track which students have boarded or opted out of travel for the day.

3.3 Parent Features

- Live Boarding Alerts: Parents receive alerts when their child scans the QR code on the bus. The live location of the bus is also displayed for tracking.

- Missed Travel Notifications: If a student misses the bus, parents will receive a notification and updates regarding alternate arrangements.

3.4 Admin/Institution Features

- Dashboard for Schools/Colleges: Admins can manage student and driver data, including bus routes, daily attendance, and driver performance.

- Bus Tracking & Analytics: Comprehensive reports on bus routes, usage trends, and safety compliance can be generated.

3.5 Additional Features

- Profile Management: Users (students, drivers, parents) can manage their profiles with necessary information and contact details.

- Multi-Login System: Users can log in as either a bus driver, student, or parent, each with custom functionalities based on their role.

- Push Notifications: Critical updates, such as bus delays, route changes, or emergency situations, are broadcasted to all users.

4. Technical Stack

- Web App: Built using HTML, CSS, and JavaScript for the front-end. Backend can be developed using Python Flask or Node.js.

- Mobile App: Android development using Java or Kotlin, with Ola Maps SDK for real-time tracking.

- Database: A scalable database like MySQL or MongoDB for storing user details, bus data, and tracking information.

- Map Integration: Ola Maps API for handling live bus location, route management, and geofencing.

5. Security Features

- QR Code Security: Ensure that the QR codes are encrypted to prevent unauthorized access.

- Data Privacy: Student and parent information will be protected using secure encryption protocols (SSL for web traffic, AES for stored data).

- Role-based Access Control: Different levels of access for drivers, students, parents, and admins to protect sensitive data.

6. Future Scope and Suggestions

- Bus Capacity Tracking: Integrate features to track how full the bus is, based on boarding status.

- Emergency Contact System: Include a panic button for students to alert drivers or parents in case of emergencies.

- Offline Capabilities: Allow students to notify drivers via SMS if they lose internet connectivity.

- AI-Powered Route Optimization: Use machine learning to optimize routes based on traffic, time, and student attendance patterns.

- Digital Payment Integration: Allow parents to pay for transportation services directly through the app, with options for monthly or yearly payments.

7. Alternate Suggestions for Name

- ShuttleGuard

- TrackMyRide

- EduBus

- BusBuddy

- SafeTransit