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