Software Requirements Specification (SRS)

Project Title: MyShuttle – Smart Shuttle Booking App

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1.Introduction

1.1 Purpose:

The purpose of this Software Requirements Specification (SRS) document is to provide a detailed description of the functional and non-functional requirements for the MyShuttle project. MyShuttle is a transportation application designed to facilitate users with shuttle services through an easy-to-use mobile platform. It allows users to book rides, track shuttles in real-time, manage payment options, and communicate with the shuttle providers.

1.2 Scope:

MyShuttle aims to provide a user-friendly shuttle service solution that operates on mobile devices (iOS and Android). The application will enable users to:

- Book shuttle rides.
- View real-time shuttle locations and estimated arrival times.
- Manage user accounts, profiles, and preferences.
- Process payments securely.
- Receive notifications regarding shuttle status and promotions.

1.3 Definitions, Acronyms, and Abbreviations:

Shuttle: A vehicle that provides transport between designated points, often on a fixed route or schedule.

- User: A person who books or uses the shuttle service.
- Admin: A person who manages the shuttle service operations.
- Driver: A person who drives the shuttle.
- App: MyShuttle mobile application for booking and tracking shuttle services.

1.4 References

- Industry standards for mobile application design and user experience.
- API documentation for payment gateway (e.g., Stripe, PayPal).
- Real-time location services API (e.g., Google Maps API).

1.5 Overview

This document is organized into three main sections, followed by appendices. Section 1 provides an introduction, scope, and overview of the MyShuttle application. Section 2 offers a high-level description of the product, its users, constraints, and dependencies. Section 3 details all specific requirements, including external interfaces, functions, performance, database, and other software attributes. The appendices provide supporting information, including diagrams.

2.Overall Description

2.1 Product Perspective

The MyShuttle application is a self-contained system that will consist of three main components: a User App, an Admin Panel, and a Driver App.

- User App: For users to book and track shuttle rides.
- Admin Panel: For administrators to manage shuttle schedules, driver assignments, and user data.
- Driver App: For drivers to receive ride assignments, track routes, and communicate with passengers and admins.

The system will operate in a cloud-based environment (e.g., AWS or Google Cloud) to handle database management, user authentication, payment processing, and real-time location tracking. The mobile applications will be compatible with both Android and iOS operating systems.

2.2 Product Features

The key features of MyShuttle include:

- User Registration and Authentication: Users can create accounts, log in, and securely access their profiles.
- Ride Booking: Users can input pickup and drop-off locations, select a shuttle route, and confirm bookings.
- Real-Time Shuttle Tracking: Users can track the shuttle's real-time location and estimated time of arrival.
- Payment Integration: Secure payment processing for bookings.
- Notifications: Push notifications for ride confirmations, updates, delays, and promotions.
- Admin Dashboard: Admins can monitor shuttle availability, assign drivers, and manage

customer interactions.

2.3 User Classes and Characteristics

- End Users: Individuals who require shuttle services. They are likely to have smartphones and a basic understanding of mobile applications.
- Drivers: Individuals operating the shuttles. They will use the Driver App to receive ride assignments and communicate with users.
- Administrators: Employees managing shuttle operations. They will use the Admin Dashboard for oversight, scheduling, and management.

2.4 Operating Environment

- Mobile Application: Compatible with both Android and iOS operating systems.
- Backend Services: Cloud-based infrastructure (e.g., AWS or Google Cloud) for handling database management, user authentication, payment processing, and real-time location tracking.
- Driver App: Android and iOS versions for driver support.

2.5 Constraints

- Real-time Location Tracking: The application will depend on mobile devices' GPS capabilities and internet connectivity.
- Payment Gateway: The payment process is subject to the limitations and rules of third- party payment processors (Stripe, PayPal).
- Regulatory Compliance: The system must adhere to transportation laws and payment security regulations (e.g., GDPR, PCI DSS).

2.6 Assumptions and Dependencies

- Users will have internet access and mobile devices with GPS capabilities.
- The application will require regular updates for maintaining compatibility with new OS versions and APIs.
- Payment processing services will be available without interruptions.

2.6 Apportioning of Requirements

The initial release will include all core functions listed in Section 2.2. Advanced features such as a "Frequent Rider Program" or detailed "Campaign Management" analytics may be delayed until a future version (v2.0).

3.System Requirements

3.1 External Interface Requirements

- **User Interfaces:** The User App will feature a modern, mobile-first design with an intuitive layout for login, booking, tracking, and payment. The Admin Panel will be a web-based interface with data visualizations and dashboards.
- **Hardware Interfaces:** The application will use the mobile device's GPS for location tracking.
- **Software Interfaces:** The system will integrate with payment systems like Stripe and PayPal for transactions and use the Google Maps API for mapping and tracking.

3.2 Functions

3.2.1 User Registration and Authentication

- **Description:** Users can create a profile and authenticate using email, social media, or phone numbers.
- **Requirements:**

- FR1: Users must be able to register via email, phone number, or social login.
- FR2: The system shall validate and store user credentials securely.
- FR3: The system must provide a password reset option.

3.2.2 Ride Booking

- **Description:** Users can input ride details, select a shuttle, and confirm the booking.
- **Requirements:**
  - FR1: Users can enter pickup and drop-off addresses.
  - FR2: The system shall display available shuttles with estimated arrival times.
  - FR3: Users can confirm the booking, and a driver will be assigned.

3.2.3 Real-Time Shuttle Tracking

- **Description:** The app will display the real-time location of the assigned shuttle and its ETA.
- **Requirements:**
  - FR1: Users must be able to track the shuttle's location on a map.
  - FR2: The app shall update the ETA based on the shuttle's location and traffic data.

3.2.4 Payment Integration

- **Description:** Allows users to securely pay for services via integrated third-party payment systems.
- **Requirements:**
  - FR1: Users must be able to save payment information securely.
  - FR2: The app shall support credit/debit cards and digital wallet payments.
  - FR3: Users shall receive a receipt upon successful payment.

3.2.5 Notifications

- **Description:** Push notifications inform users, drivers, and admins about ride status and other updates.
- **Requirements:**
  - FR1: Users shall receive notifications about shuttle arrivals, delays, and promotions.

- FR2: Admins and drivers shall receive notifications about assignments and ride completions.

3.2.6 Admin Dashboard

- **Description:** Allows administrators to manage users, view reports, and assign drivers.
- **Requirements:**
  - FR1: Admins must be able to view ride schedules and manage driver availability.
  - FR2: Admins can track payment records and issue refunds.
  - FR3: Admins can update shuttle routes and manage fleet maintenance schedules.

3.3 Performance Requirements

- The application must load within 2 seconds on an average 4G network connection.
- Real-time shuttle tracking updates must be reflected on the user interface within 30 seconds of the shuttle's location change.

3.4 Logical Database Requirements

The system shall maintain a database to store information related to users, drivers, shuttles, and rides.

- **Data Entities:** User Profile (User ID, name, contact info, encrypted payment details), Driver Profile (Driver ID, name), Ride History (Ride ID, route, fare), and Shuttle Fleet (Shuttle ID, capacity, current location).
- **Relationships:** Each ride must be linked to a User Profile and Driver Profile.
- **Integrity Constraints:** A User ID must be unique. A driver cannot be assigned to more than one active ride at the same time.
- **Data Retention:** Ride history must be retained for a minimum of 24 months.

3.5 Design Constraints

- **Real-time Location Tracking:** The application will depend on mobile devices' GPS capabilities and internet connectivity.

- **Payment Gateway:** The payment process is subject to the limitations and rules of third-party payment processors (e.g., Stripe, PayPal).
- **Regulatory Compliance:** The system must adhere to regional transportation laws and data protection standards like GDPR.

3.6 Software System Attributes

- **3.6.1 Security:** All user data must be encrypted in transit and at rest using secure protocols (e.g., SSL/TLS). The system must implement role-based access control (RBAC).
- **3.6.2 Availability:** The application should be available 24/7 with a target uptime of 99.9%. Backup and disaster recovery procedures must be in place.
- **3.6.3 Usability:** The application must be easy to navigate with a minimal learning curve. The UI should be responsive and adapt to various screen sizes.
- **3.6.4 Maintainability:** The software should be developed with modularity to allow for ease of maintenance and updates.
- **3.6.5 Compatibility:** The mobile app must be compatible with the latest and previous major versions of iOS and Android.

4.External Interface Requirements

4.1 User Interfaces

- User Interface (UI): A modern, mobile-first design with an intuitive layout. The application will include screens for login, booking, tracking, and payment processing.
- Admin Interface (UI): A web-based interface with data visualizations and dashboards to manage shuttles, users, and drivers.

4.2 Hardware Interfaces

- The application will use the mobile device's GPS for tracking shuttles.
- A third-party payment gateway will integrate for processing payments securely.

4.3 Software Interfaces

- Integration with payment systems such as Stripe and PayPal for processing transactions.
- Google Maps API for shuttle tracking and mapping.

5. Non-Functional Requirements

5.1 Performance Requirements

- The application must load within 2 seconds on average.
- Real-time shuttle tracking updates should be reflected on the user interface within 30 seconds.

5.2 Security Requirements

- All user data (including personal and payment information) must be encrypted using secure protocols (e.g., SSL/TLS).
- The application must implement role-based access control (RBAC) to ensure that only authorized users can access certain features.

5.3 Availability

- The application should be available 24/7 with minimal downtime.
- Backup and disaster recovery procedures must be in place.

5.4 Usability

- The application must be easy to navigate, with a minimal learning curve for new users.
- The user interface should be responsive and adapt to various screen sizes (smartphones and tablets).

5.5 Compatibility

- The mobile app should be compatible with the latest iOS and Android versions.

5.6 Legal and Regulatory Requirements

- The application must comply with local and international data protection regulations (e.g., GDPR).
- The shuttle service must follow regional transportation laws and safety standards.

6.Appendices

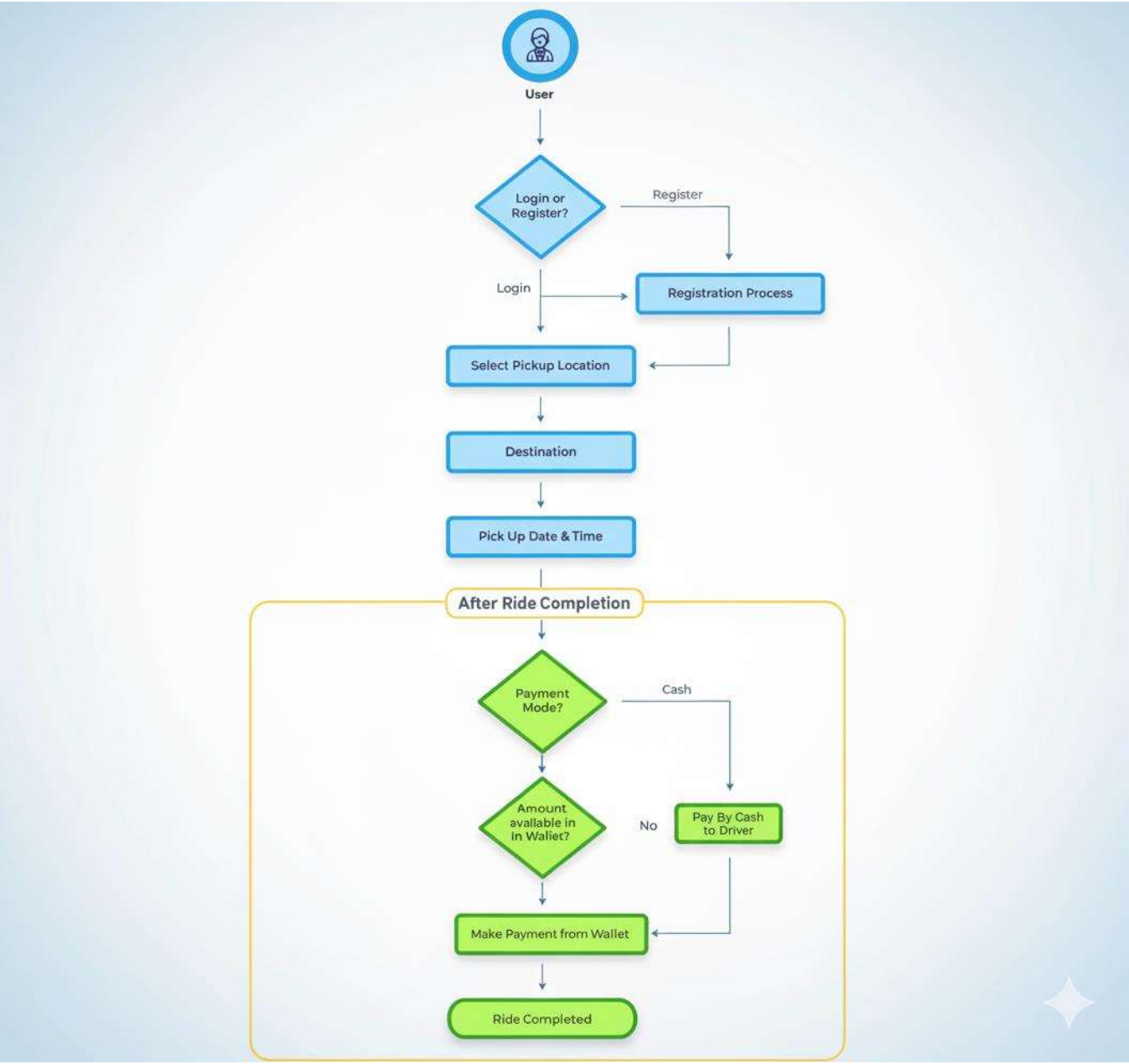
6.1 Glossary

- Shuttle: A vehicle that operates on a scheduled route for transportation.
- User Profile: A user's personal information and preferences stored in the system.

6.2 Diagrams

- Flowchart for the ride booking process.
- Architecture diagram for the mobile application.

FLOWCHART: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Register
Login
Registration Process
Select Pickup Location
Destination
Pick Up Date & Time
After Ride Completion
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Pay By Cash to Driver
Make Payment from Wallet
Ride Completed

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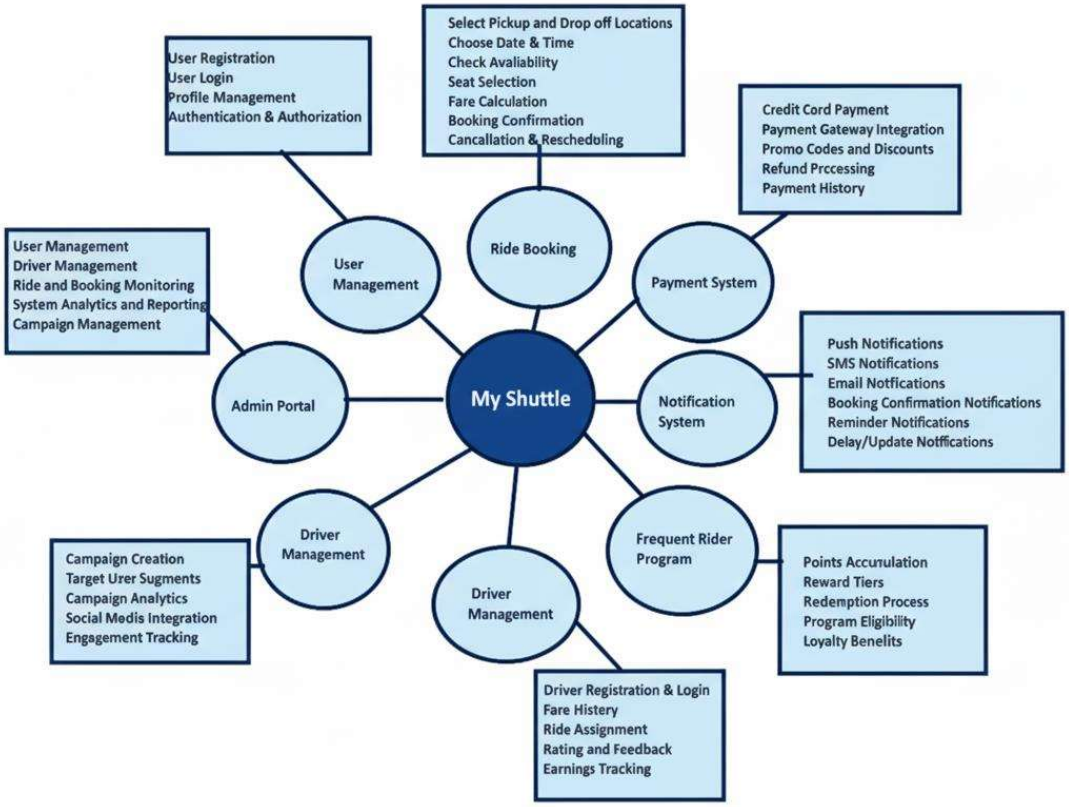
My Shuttle
User Management
User Registration
User Login
Profile Management
Authentication & Authorization
Ride Booking
Select Pickup and Drop off Locations
Choose Date & Time
Check Avaliability
Seat Selection
Fare Calculation
Booking Confirmation
Cancellation & Rescheduling
Payment System
Credit Cord Payment
Payment Gateway Integration
Promo Codes and Discounts
Refund Prccessing
Payment History
Notification System
Push Notifications
SMS Notifications
Email Notfications
Booking Confirmation Notifications
Reminder Notifications
Delay/Update Notfications
Frequent Rider Program
Points Accutulation
Reward Tiers
Redemption Process
Program Eligibility
Loyalty Benelits
Driver Management
Driver Registration & Login
Fare Histery
Ride Assignment
Rating and Feedback
Earnings Tracking
Driver Management
Campaign Creation
Target Urer Sugments
Campaign Analytics
Social Medis Integration
Engagement Tracking
Admin Portal
User Management
Driver Management
Ride and Booking Monitoring
System Analytics and Reporting
Campaign Management