CSE306: Software Engineering and Information System Design Lab

PREPARE SOFTWARE REQUIREMENT SPECIFICATION (SRS) DOCUMENT

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A report submitted in partial fulfillment of the requirements for the assignment of CSE306: Software Engineering and Information System Design Lab

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Abstract

This document outlines the success and impact of the Bangladeshi transport-tech startup, Shuttle, which has gained recognition for its innovative approach to ride-sharing. By bringing together 4-10 individuals in sedans and minivans, Shuttle provides a cost-effective solution to traditional ride-sharing, contributing to reduced pollution and earning its founders spots on Forbes 30 under 30 Asia list. The startup's expansion beyond women-only services to include unisex and B2B offerings, along with the recent launch of "Shuttle for School," showcases its commitment to addressing diverse commuting needs in Dhaka city. With over 30,000 registered users, predominantly women, and collaborations with 50+ organizations, Shuttle has positioned itself as a key player in Bangladesh's transportation sector.

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Chapter 1

Introduction

Addressing Bangladesh's escalating traffic challenges, Shuttle emerges as a solution, pioneering a cost-effective, safe, and eco-friendly ride-sharing model. The startup's evolution, from women-only services to versatile B2B offerings, reflects its commitment to diverse commuting needs. With features like effortless booking, safety measures, and the unique "Shuttle for School" initiative, Shuttle aims to revolutionize transportation in Bangladesh. Beyond mere convenience, Shuttle prioritizes societal concerns, contributing to a greener environment while fostering economic opportunities for its users.

1.1 Problem Statement

The burgeoning traffic congestion in Dhaka city and the challenges associated with affordable, safe, and convenient transportation prompted the inception of Shuttle. The startup addresses these issues by pioneering a ride-sharing model that significantly reduces costs for users and minimizes environmental impact. Through the introduction of "Shuttle for School," Shuttle takes a step further in tackling traffic congestion, aligning with Dhaka North City Corporation's initiative.

1.2 Background

Founded with a primary focus on providing women-only services, Shuttle's evolution into unisex and B2B offerings reflects its adaptability to diverse commuting requirements. The background of Shuttle is rooted in a commitment to enhancing daily com-

mutes for middle-income individuals in Bangladesh.

1.3 Benefits of Application

The tangible benefits of Shuttle extend beyond cost reduction, addressing societal concerns such as safety for women during commute and contributing to a greener environment. The ”Shuttle for School” initiative not only aids students but also aligns with broader city-level efforts to alleviate traffic congestion.

1.4 Objectives

Provide cost-effective and convenient transportation solutions. Expand services to cater to diverse commuting needs. Collaborate with government initiatives for sustainable urban development. Enhance safety and accessibility for women during commute.

1.5 Purpose

The purpose of Shuttle is to revolutionize mass transit in Bangladesh, offering a comprehensive solution to the transportation challenges faced by the majority of the population. The startup aims to create a positive impact on daily commuting experiences while fostering economic opportunities for its users.

1.6 Feature of Application

Feature	Customers Benefits	Professionals Features
Effortless Booking	Find rides easily based on current location.	Efficient allocation and utilization of available vehicles.
Swift Response	Quick responses for prompt and efficient service.	Monitoring and optimizing response times for better service.
In-App Communication	Seamlessly chat with drivers for queries or instructions.	Improved customer service and issue resolution capabilities.
Flexible Payment Options	Convenient payment methods for user flexibility.	Diverse financial tracking and revenue collection avenues.
Booking History	Transparent record of past rides and payments.	Data insights for customer behavior and service improvements.
Route Optimization	Efficient route planning for reduced travel time.	Enhanced management of fleet and resource optimization.
Real-time Updates	Stay informed with live updates on ride progress.	Monitor and manage real-time operational efficiency.
Safety Features	Driver ratings for secure and reliable service.	Monitoring and enhancing overall safety standards.
Shuttle for School	Dedicated service for students' transportation needs.	Specialized service management for school routes.
Corporate Commuting Solutions	B2B offerings for businesses' daily commutes.	Corporate partnership management and service customization.
Environment-Friendly Option	Shared ride option for reduced pollution.	Environmental impact tracking and sustainability initiatives.
Special Consideration for Women	Ensured safety for all riders.	Gender-focused safety measures and community building.

Table 1.1: Feature of Application

Chapter 2

UML Diagram

2.1 Process Model: Incremental Model

Our selected process model, the Incremental Model, is a powerful iterative and adaptive approach to software development that aligns perfectly with the dynamic and innovative nature of our startup, Shuttle. The Incremental Model divides the system development into smaller, manageable parts or increments, facilitating a flexible and responsive approach to the evolving needs of users and market trends.

One of the primary advantages of the Incremental Model is its time efficiency. By delivering a functional product incrementally, we can respond quickly to changing user demands and emerging industry trends. This iterative approach ensures a quicker adaptation to the dynamic landscape of the transportation industry. Moreover, it allows for regular assessment and incorporation of user feedback, ensuring that our product remains aligned with user expectations and preferences.

Another crucial aspect of the Incremental Model is its flexibility. This flexibility enables adjustments based on user feedback and market changes. As we receive feedback from users or observe shifts in the transportation landscape, we can easily incorporate these insights into our subsequent increments. This adaptability is essential in a field where user preferences and market dynamics can change rapidly.

Additionally, the Incremental Model minimizes risks by delivering a functional product in incremental stages. Each increment builds upon the previous one, and any issues or challenges identified in earlier stages can be addressed before proceeding further. This phased development approach enhances our ability to manage risks effectively and ensures that the final product meets the desired quality standards.

In summary, the Incremental Model is a strategic choice for Shuttle, providing time efficiency, flexibility, and risk mitigation, crucial factors in the ever-evolving and competitive field of transportation technology.

2.2 Use Case Diagram: Shuttle Ride Booking

The use case diagram serves as a visual representation of how users interact with our system. In the case of Shuttle's ride booking system, the diagram encompasses three main actors: passengers, riders, and the admin. This comprehensive illustration allows for a holistic understanding of the functionalities and interactions within the system.

Passenger Use Cases:

Register/Login: New passengers register and login, while returning users can directly log in.
Filtering and Discounts: Passengers can filter vehicle types and avail exclusive discounts.
Communication and Tracking: Passengers can communicate with drivers, track ride locations, and check transaction history.
Payment: Passengers can make payments for rides.
Rider Ratings: Passengers can view rider ratings without logging in.

Rider Use Cases:

Register/Login: New riders register and login, while returning riders can directly log in.
Ride Management: Riders can manage ride requests, communicate with passengers, and handle payments.
Balance Management: Riders can check their balance and withdraw money.
Passenger Ratings: Riders can view passenger ratings without logging in.

Admin Use Cases:

User Management: The admin manages users, ensuring the smooth functioning of the system.

The use case diagram provides a comprehensive overview of the system's functionalities, guiding our development team in creating a user-centric and efficient ride booking platform.

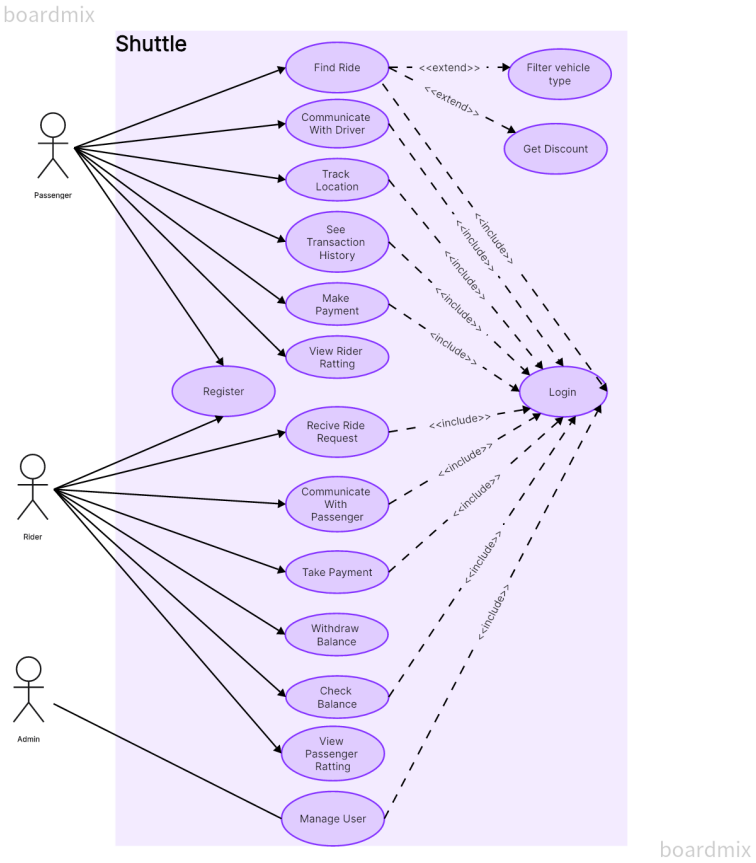

Figure 2.1: Use Case Diagram

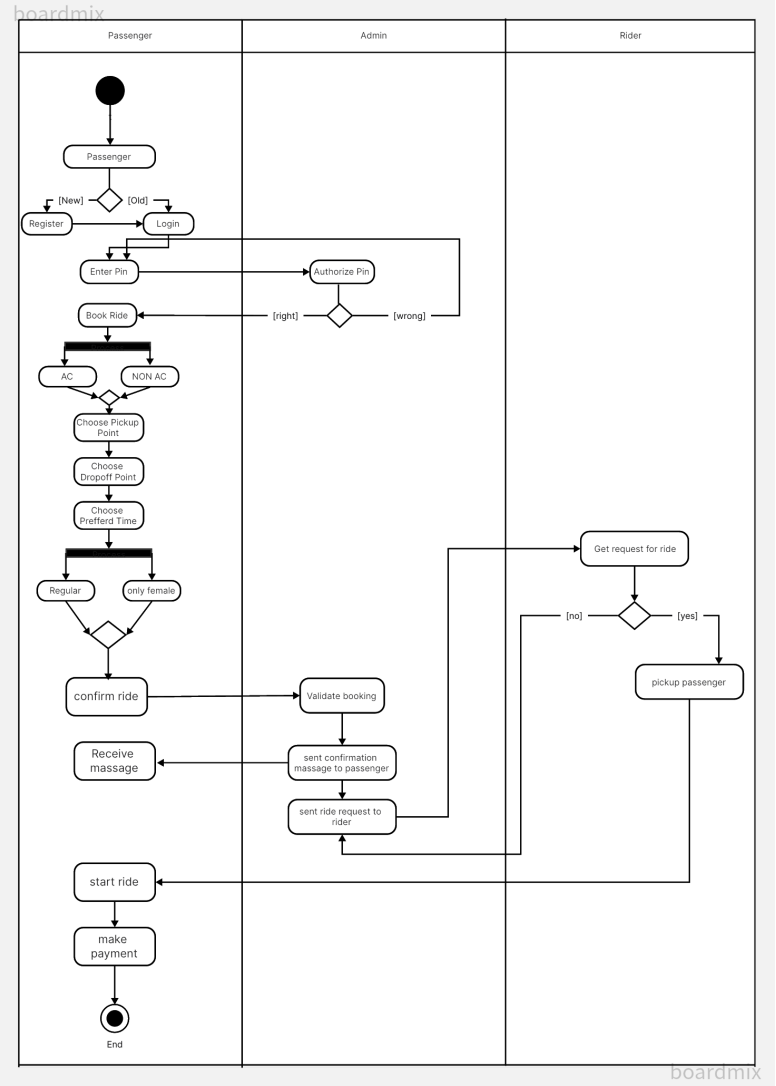

Figure 2.2: Activity Diagram

2.3 Activity Diagram: User Interaction Workflow

The activity diagram presents a detailed and step-by-step workflow of user interactions within the Shuttle system. It provides insights into how new passengers register, login, and navigate through the system, ensuring a seamless and user-friendly experience.

New Passenger Registration and Login:
Registration: New passengers begin by registering, providing necessary details.

Login: After registration, passengers enter a PIN, authorized by the admin, and successfully log in.

Navigating Through the System:

Booking a Ride: Passengers select various ride options, including vehicle types, pickup and dropoff points, preferred times, and ride confirmation.

Admin Validation: The admin validates the booking and sends a confirmation message to the passenger.

Ride Request: The admin sends a ride request to a rider. **Rider Acceptance:** If the first rider declines, the system retries with the next available rider. Once accepted, the rider proceeds to pick up the passenger.

Ride Commencement and Conclusion: The rider starts the ride, and after reaching the destination, the passenger makes the payment, concluding the process.

The activity diagram visually maps out the user journey, allowing for a deep understanding of the intricate steps involved in interacting with the Shuttle system.

2.4 Sequence Diagram: Ride Booking Process

The sequence diagram provides a detailed representation of the interactions and flow of control between various elements in the Shuttle ride booking process. It offers a chronological view of events, capturing the dynamic nature of ride bookings.

App Opening: The **passenger** opens the app.

Registration/Login: If a new passenger, they register and login. For returning users,

direct login.

Booking a Ride: The passenger books a ride, and the system sends a ride request to the first rider.

Rider Acceptance: The first rider can either accept or decline. If declined, the system retries with the next available rider.

Confirmation: Once a rider accepts, the system sends a confirmation message to the passenger.

Ride Commencement and Conclusion: The rider proceeds to pick up the passenger, starts the ride, and after reaching the destination, the passenger makes the payment.

System Updates:

Fare Calculation: The system calculates the fare for the ride.

Payment: The passenger makes the payment.

Transaction History Update: The system updates the transaction history.

The **sequence diagram** provides a comprehensive view of the ride booking process, showcasing the interactions between passengers, riders, and the system.

Conclusion:

In **conclusion**, the Incremental Model serves as the foundation for our development process, ensuring adaptability, flexibility, and risk mitigation. The **use case diagram**, **activity diagram**, and **sequence diagram** collectively provide a detailed understanding of how Shuttle's ride booking system functions, offering insights into user interactions, system workflows, and the dynamic processes involved. Together, these models and diagrams guide our development team in creating an efficient, user-friendly, and responsive ride booking platform. The Incremental Model, coupled with these visual representations, positions Shuttle for success in the competitive realm of transportation technology.

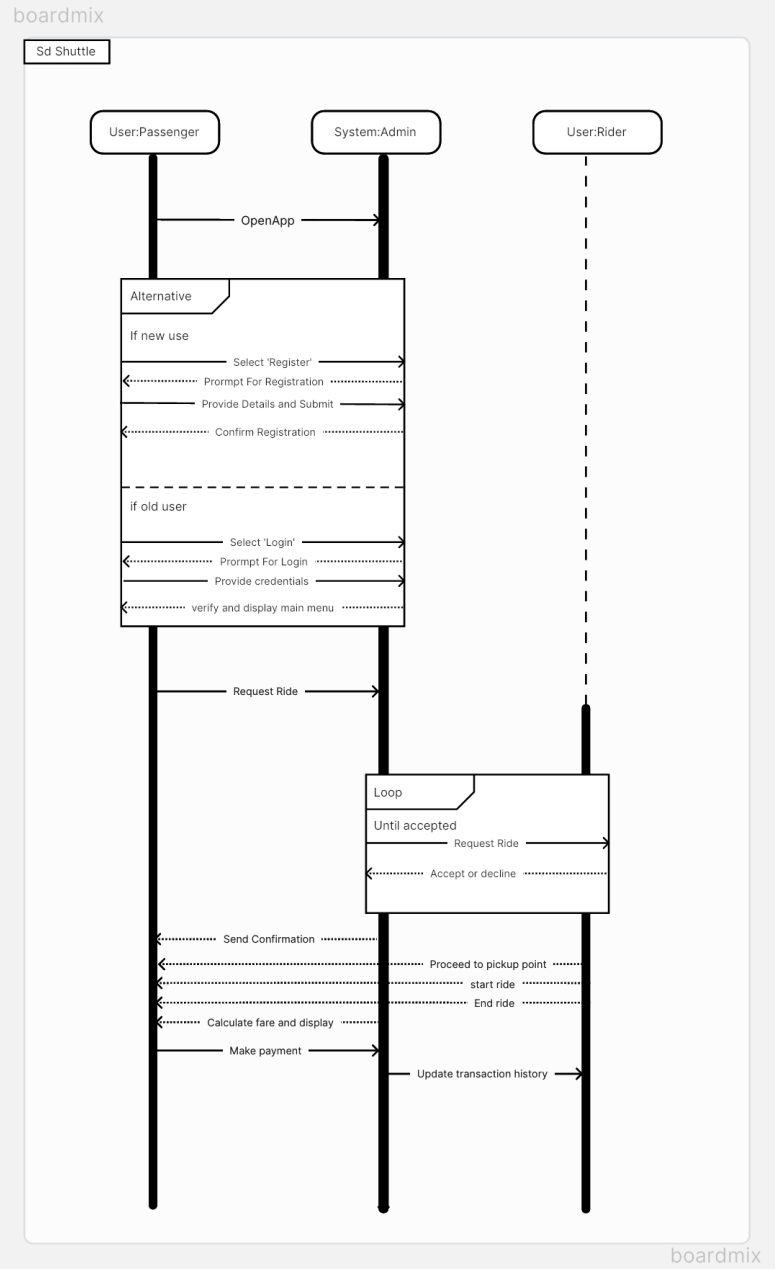

Figure 2.3: Sequence Diagram