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**BEACONHOUSE NATIONAL UNIVERSITY**

**SaafPakistan**

**PRJ-F23/329**

**Design Document**

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**Introduction**

SaafPakistan is a revolutionary mobile app addressing waste management challenges in Pakistan. Key features include easy recycling pickup scheduling, a gamified leaderboard system for individuals and businesses, a friend connection feature, and rewards for recycling efforts. Corporate onboarding allows businesses to showcase environmental initiatives, gaining recognition as green companies. The app also offers educational content on effective recycling. The dashboard provides users with a summary of their achievements, aiming to streamline waste management, promote responsible waste disposal, and highlight the significance of sustainability practices.

**Technologies**

**WebApp:**

* + - React

Udemy Course (https://www.udemy.com/course/the-ultimate-react-course/)

* + - Firebase

Degree Course

**MobileApp:**

* + - Flutter

Degree Course

* + - Firebase

Degree Course

**System Context Diagram**

This is the System Context Diagram of the system. It focuses on people and software systems and only shows the system landscape. There are four actors and two software systems.

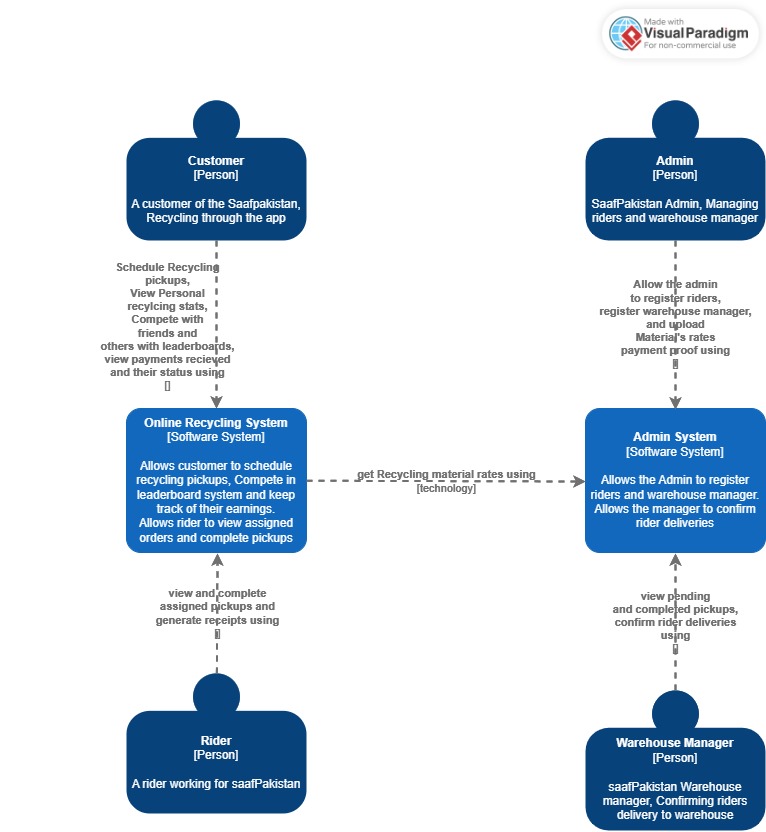
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Figure 1 System Context Diagram

**High-Level Architecture**

This is the high-level architecture of the system. It shows major technology choices and how the software systems interact with each other. There are four actors and three major components of the system, a mobile app(Flutter), a web app(React) and the database(Firebase Firestore).

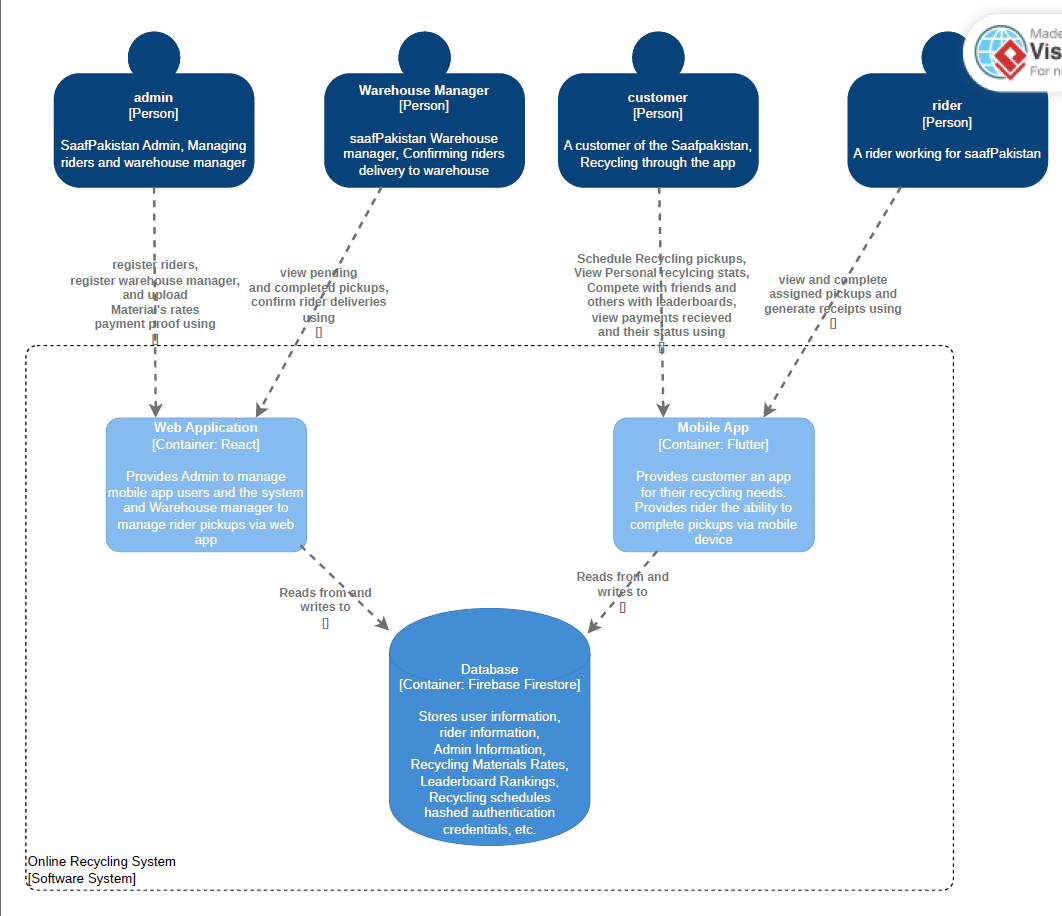
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Figure 2 High Level Architecture

**Low-level Architecture**

This is the low-level architecture of the system. In this we dive deeper into the software system. It shows the major components of the container, its technology and implementation details.

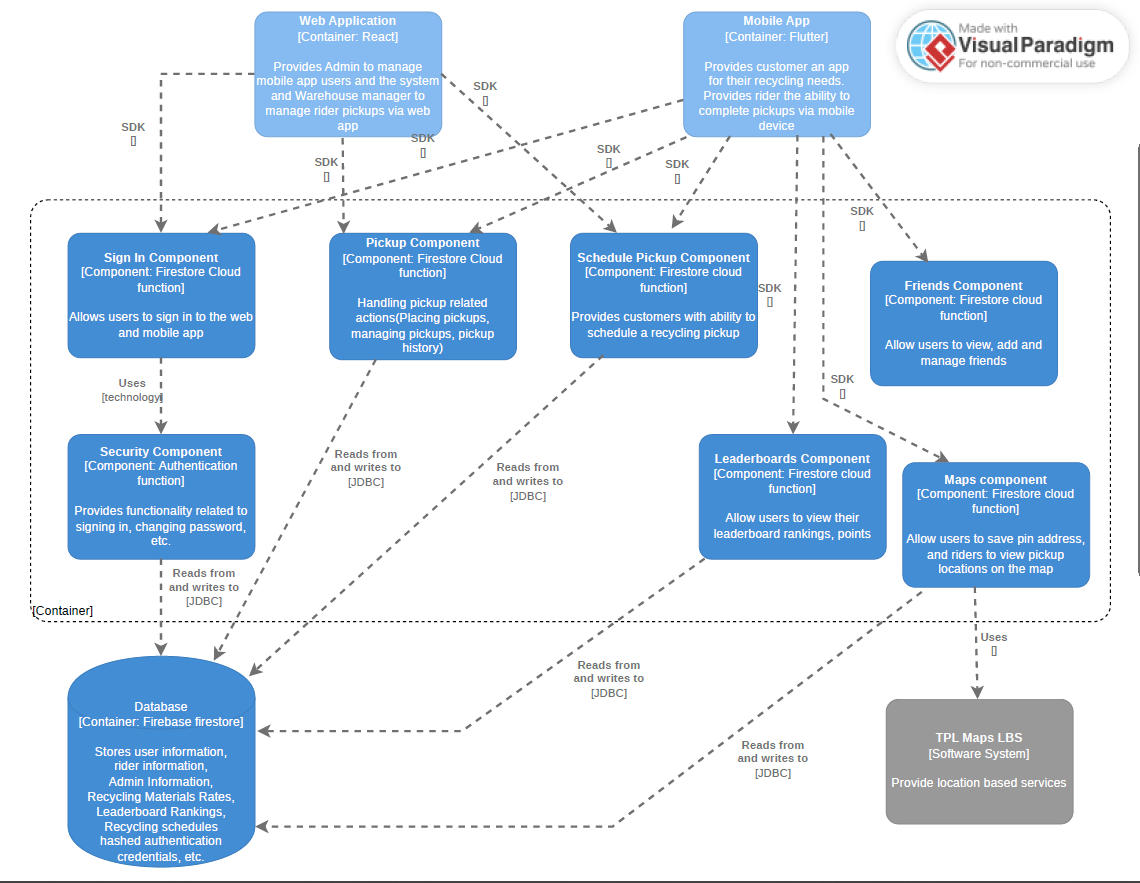
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Figure 3 Low level Architecture

**Class Diagram**

The class diagram below models all the various classes, interfaces and the relationships between them. It describes the structure of the system showing the classes, their attributes, methods and the relationships between them.

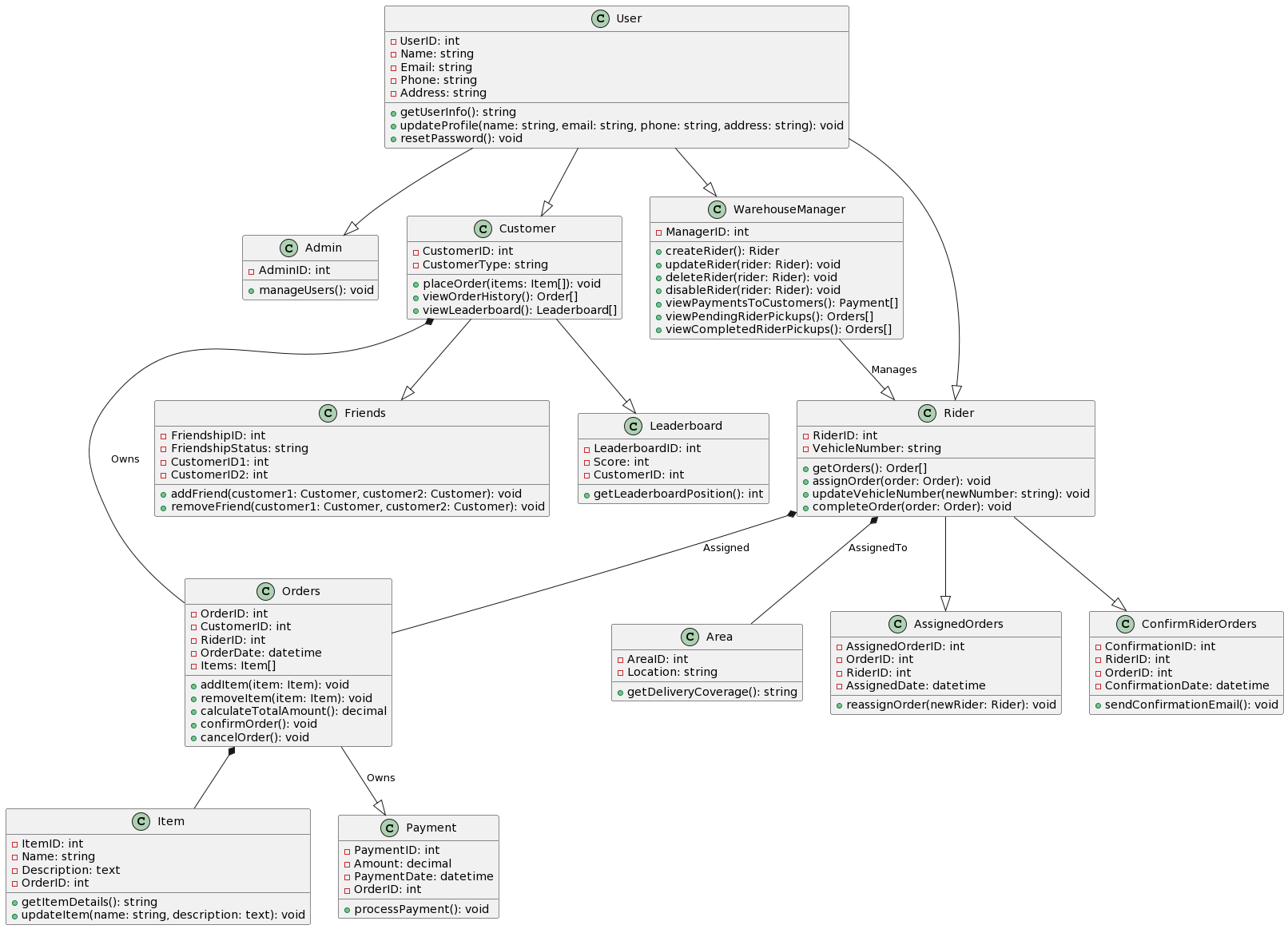
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Figure 4 Class Diagram

**Database Schema**

SaafPakistan is developed using Firebase FireStore as the database for the application. Firestore is a NoSQL serverless database with real-time notification capability, and together with the Firebase ecosystem it greatly simplifies common app development challenges while letting the application developer focus primarily on their business logic and user experience.

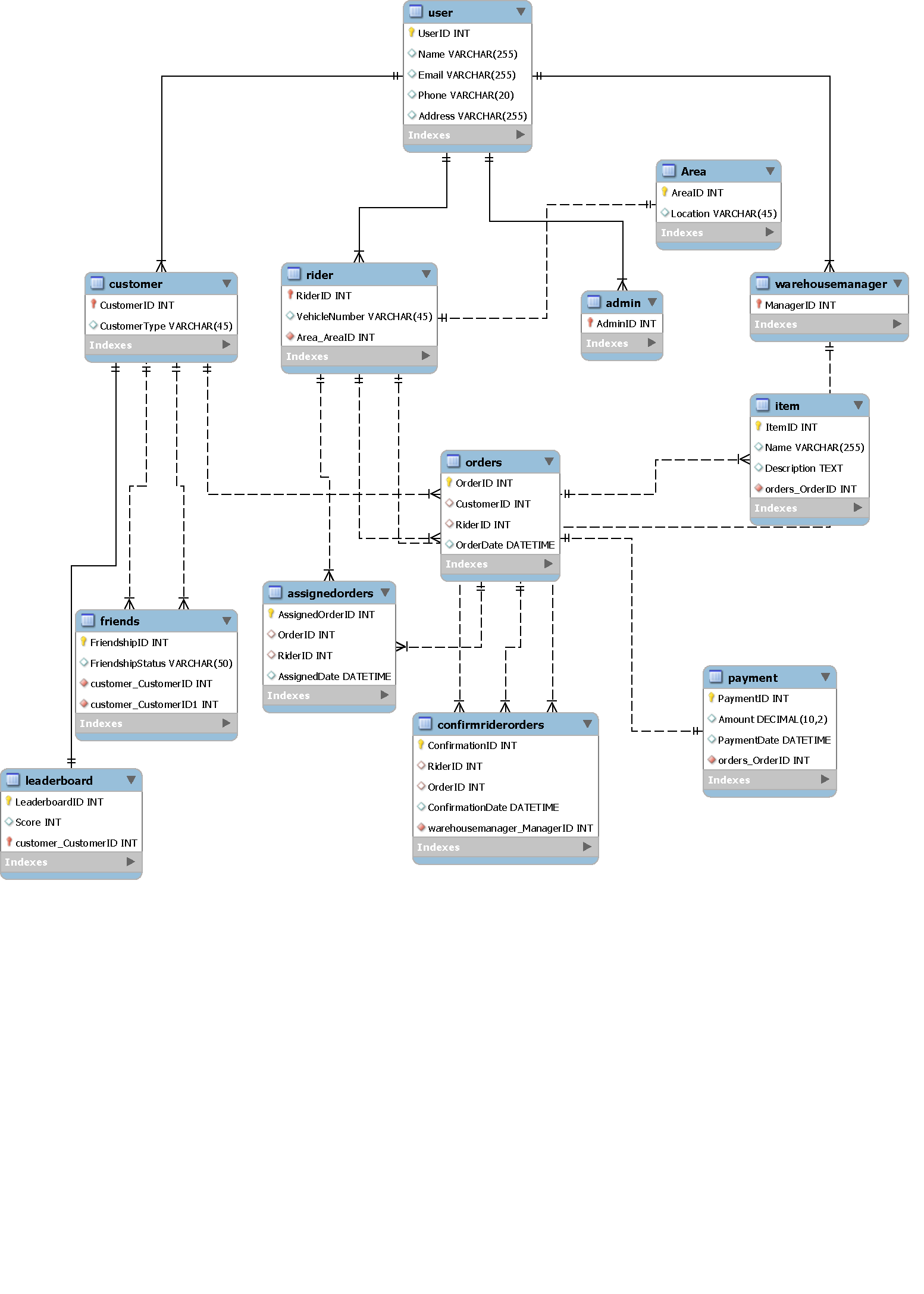
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Figure 5 Database Schema

**Sequence Diagram**

Following are the sequence diagrams for the highest priority requirements.

**Schedule Pick-Up (FR 1.6)**

This is a sequence diagram of how a customer will schedule a pickup. It highlights how the customer navigates the screens, selects recyclables that he wants to recycle, and confirms the recycling pickup request.

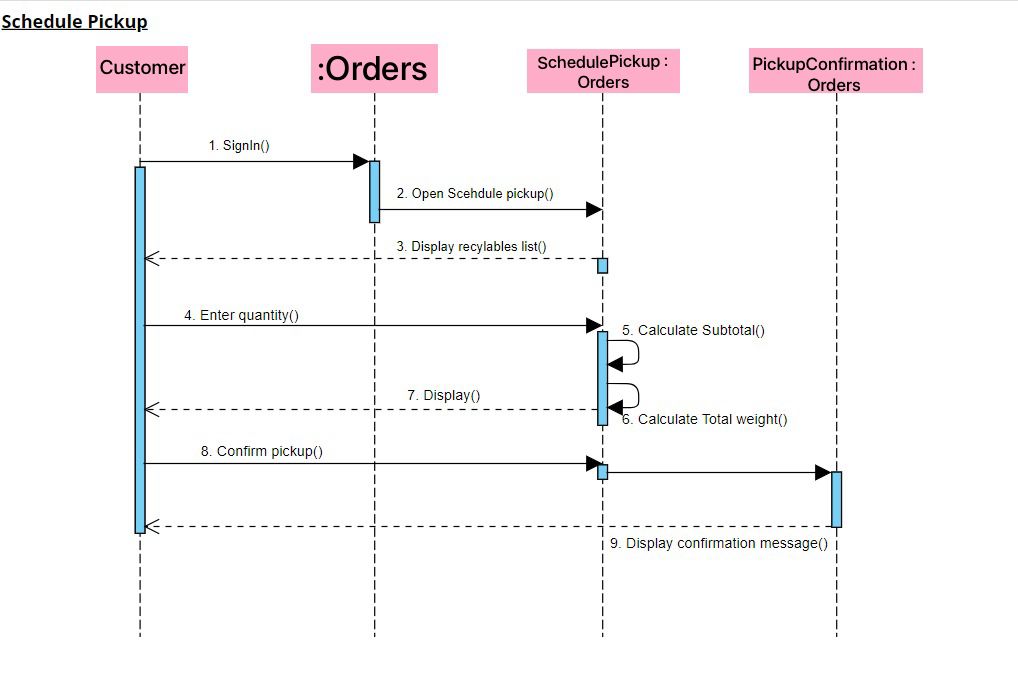
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Figure 6 Sequence Diagram 1: Schedule Pickup

**Complete Pick-Up (FR 1.22 - 1.26)**

This is a sequence diagram of how a rider will complete a pickup. It shows how the rider will select an order, complete pickup and generate receipt.

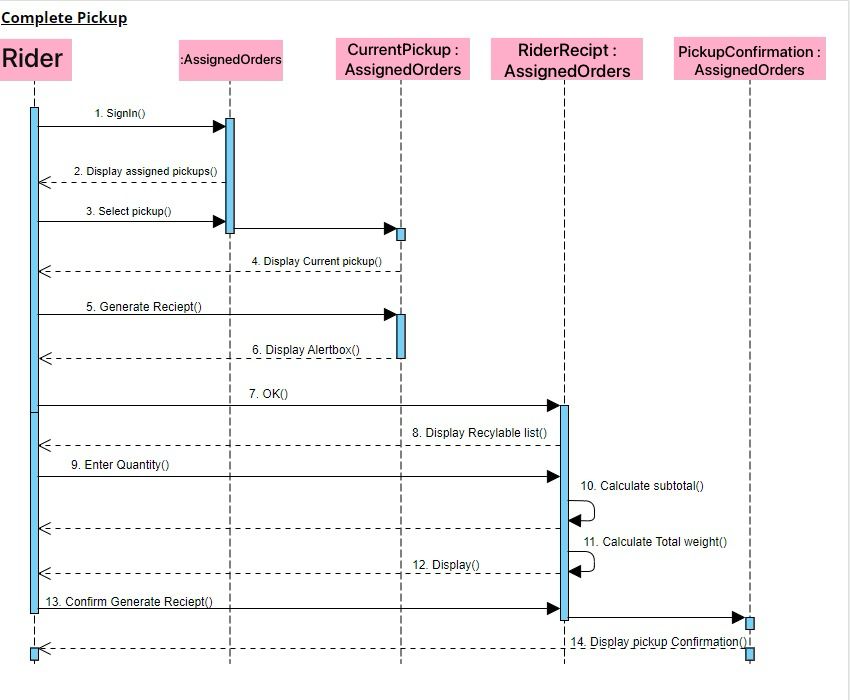
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Figure 7 Sequence Diagram 2: Complete Pickup

**References**

1. <https://firebase.google.com/docs/android/setup>
2. <https://legacy.reactjs.org/docs/getting-started.html>
3. <https://docs.flutter.dev/ui/widgets>