Software Design & Construction

Group Project

Mobile Application Architecture Design

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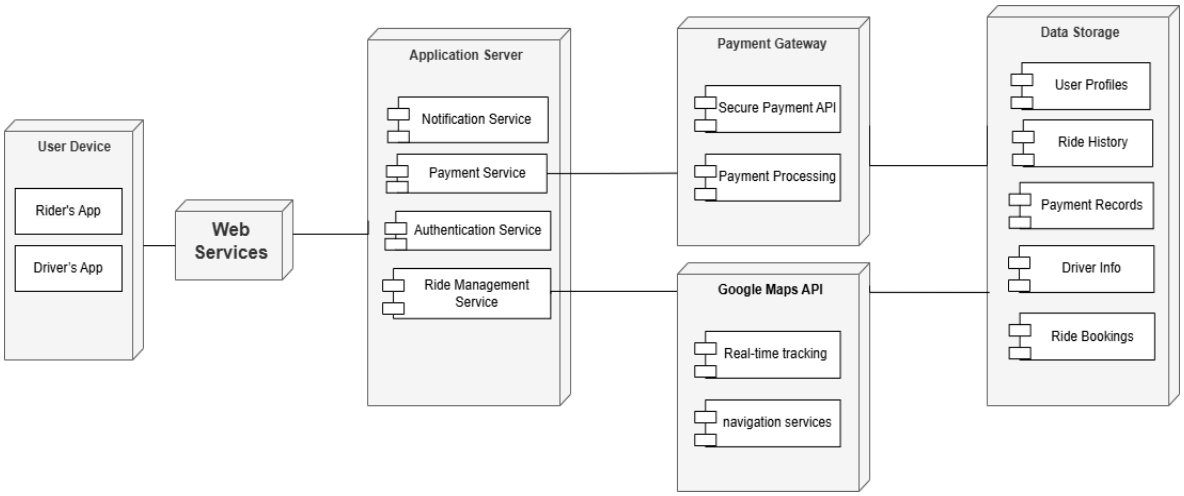
1. Architectural Design

A. System Overview

The ride-booking mobile application is designed to provide users with a seamless and efficient way to request transportation services. Its core purpose is to connect passengers with nearby drivers, offering a smooth experience from ride request to payment ensuring safety and convenience.
The core functionalities: Ride Request, Ride Confirmation, Payment Process.

B. Architecture Diagram



C. Explanation of Key Components

User Device (Rider's App & Driver's App):
Mobile apps for riders to request rides, track status, and make payments, and for drivers to receive requests, navigate, and update ride status.

Web Services:
Acts as the bridge between the user devices and backend, managing API requests, authentication, and data transfer.

Application Server:

The core server that manages different services of the ride-booking app. It contains the following services:

- **Notification Service:** Sends real-time notifications to users about ride status, driver arrival, or payment confirmation.
- **Payment Service:** Manages the financial transactions between the rider and the driver, and interacts with the payment gateway.
- **Authentication Service:** Handles user authentication, including login, user verification, and security checks.
- **Ride Management Service:** Manages the lifecycle of a ride request from initiation to completion, including ride allocation and driver matching.

Payment Gateway:

This external service handles secure payment processing. It includes:

- **Secure Payment API**: Ensures safe and encrypted transmission of payment information between the application and payment processors.
- **Payment Processing:** Manages the actual transaction, whether through credit card, digital wallet, or other payment methods.

Google Maps API:

Provides essential location-based services like:

- **Real-time Tracking**: Tracks the rider's and driver's locations throughout the ride.
- **Navigation Services**: Offers route suggestions and navigation for the driver.

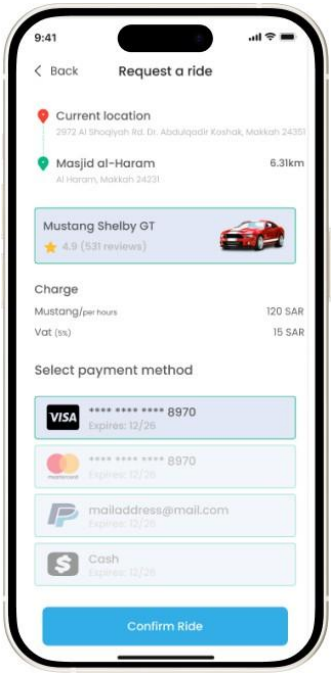
Data Storage:

A database that stores important user and ride data, including:

- **User Profiles**: Information about the users, such as personal details, preferences, and settings.
- **Ride History:** Stores the history of rides taken by users.
- Payment Records: Keeps track of payment transactions and methods.
- **Driver Info:** Stores information about drivers, their ratings, and their availability.
- **Ride Bookings**: Logs ride bookings, statuses, and timestamps for later retrieval and analysis.

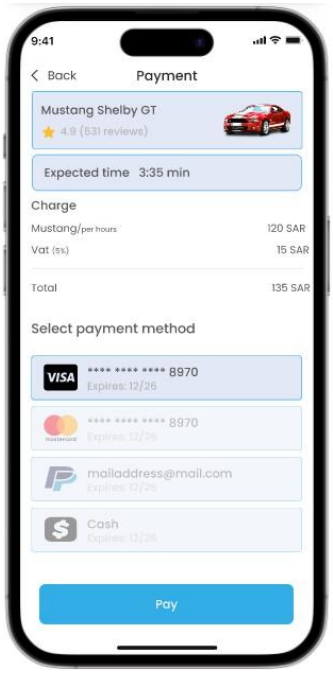
2. High-Fidelity Prototype

A. Feature 1: Ride Request



B. Feature 2: Ride Confirmation

C. Feature 3: Payment Process



Figma Project Link:
https://www.figma.com/design/cjAbnAxN3MLpxh17bZm1oV/Ride_Booking_project?node-id=15-284&node-type=canvas&t=F1v30WQctcclIqvQ-0