

# Business Requirements Document (BRD)

## Project: Comprehensive Vehicle Buy-Sell and Service Platform

# 1. Project Overview

## 1.1 Purpose

This project aims to build a comprehensive web platform for vehicle owners to buy, sell, and service cars, ensuring transparent pricing, secure transactions, and trusted interactions between buyers, sellers, and service providers. The platform will provide price estimates for vehicles based on market data and allow users to compare prices and ratings of local maintenance service providers.

## 1.2 Objectives

- To provide a platform where users can list and sell their vehicles with automated price estimations.
- To allow users to buy vehicles with full transparency on pricing and vehicle condition.
- To create a platform for vehicle maintenance services, offering users the ability to evaluate services based on pricing and reviews.
- To foster trust between buyers, sellers, and service providers by integrating a review and rating system.

## 1.3 Scope

The platform will be developed using the MERN (MongoDB, Express, React, Node) stack with TypeScript for both front-end and back-end development. The scope includes:

- User authentication (registration, login, profile management)
- Car listing and buying functionality
- Car market price estimation using external APIs
- Comparison of maintenance service providers based on location, price, and reviews
- Secure transaction handling for car sales
- Responsive design with easy user experience.
- Admin portal for managing users, car listings, services and view reports.

## 2. Business Requirements

### 2.1 Functional Requirements

#### 1. User Registration and Authentication

- Users must be able to register with their email and password.
- Users must be able to log in and access their personal dashboards to manage their listings and reviews.
- Secure authentication must be implemented using JWT tokens for session management.

#### 2. Car Listing for Sale

- Sellers can list a car for sale by providing details like make, model, year, mileage, and condition.
- An estimated market price will be provided based on external API data.
- A mechanic will check the condition and can make further price discussions
- Listings will be publicly visible, and potential buyers can contact sales team through the platform.

#### 3. Market Price Estimation

- The platform will integrate external APIs to estimate the market value of a car based on its specifications.
- Users can view the estimated price range before submitting a car listing.

#### 4. Buying a Car

- Buyers can browse available cars with advanced filters (price range, make, model, year).
- Buyers can sort cars by price, mileage, and condition.
- Buyers can securely complete purchases via the platform.

#### 5. Comparison of Car Maintenance Services

- Users can search for car maintenance services by location and service type.
- Price comparisons from different service providers must be displayed along with user ratings.
- Users can book services directly through the platform.

#### 6. Review and Rating System

- Users can rate and review car sellers and service providers after completing transactions or receiving services.
- Average ratings and written reviews will be displayed on the seller or service provider's profile.

#### 7. Secure Transactions

- Payments for car purchases or service bookings must be processed securely through a third-party payment gateway.
- Transaction receipts must be generated for both the buyer and the seller.

#### 8. Admin Portal

- Admins can manage user accounts, car listings, and service providers.
- Admins can remove inappropriate listings and block fraudulent users.
- Admins will monitor ratings and reviews to ensure fair practices.

## 3. Stakeholders

### 3.1 Internal Stakeholders

- Project Manager: Oversees project timeline, budget, and deliverables.
- Development Team: Responsible for developing and maintaining the platform (front-end, back-end, database).
- QA Team: Ensures that the platform meets quality and security standards.
- Admin Users: Manages platform operations, user accounts, and listings.

### 3.2 External Stakeholders

- Vehicle Owners (Sellers): Use the platform to sell their cars with market price estimation.
- Car Buyers: Use the platform to browse and buy used cars.
- Service Providers: Offer maintenance services that users can compare and book.
- Payment Gateway Provider: Ensures secure transactions for both car sales and services.

## User Stories for Regular Users

### 1. User Registration and Authentication

- As a user, I want to be able to register an account so that I can access the platform's features.
- As a user, I want to log in using my credentials to access my account securely.
- As a user, I want to reset my password in case I forget it.

### 2. Profile Management

- As a user, I want to view and edit my profile information so I can update my personal details.
- As a user, I want to upload a profile picture to personalize my account.

### 3. Car Listing and Selling

- As a user, I want to list my car for sale by providing relevant details (make, model, mileage, condition) so that potential buyers can view it.
- As a user, I want to estimate my car's market value based on its features so I can list it at a competitive price.
- As a user, I want to edit or update my car listing if I need to adjust details or pricing.
- As a user, I want to remove my car listing if it has been sold or I no longer wish to sell it.

### 4. Browsing and Buying Cars

- As a user, I want to browse available cars with filtering options (e.g., make, model, price) so that I can find cars that meet my criteria.
- As a user, I want to view detailed information about each car so I can make an informed buying decision.

- As a user, I want to save cars to a favorites list so I can easily find them later.
- As a user, I want to make a purchase for a car and complete the transaction online for convenience.

#### 5. **Service Provider Search and Booking**

- As a user, I want to search for service providers near my location to find reputable mechanics and garages.
- As a user, I want to view detailed information about each service provider, including services offered, pricing, and user ratings.
- As a user, I want to book a service appointment with a provider for car maintenance.

#### 6. **Ratings and Reviews**

- As a user, I want to leave a rating and review for a service provider after using their services to share my experience.
- As a user, I want to view ratings and reviews of service providers from other users to help me choose a trusted provider.

#### 7. **Notifications**

- As a user, I want to receive notifications for important updates (e.g., offers, responses to listings, service reminders) so I stay informed.
- As a user, I want to manage my notification preferences to control which alerts I receive.

#### 8. **Transaction History**

- As a user, I want to view my transaction history to track past purchases and services.

## **User Stories for Admins**

#### 1. **Admin Authentication and Access Control**

- As an admin, I want to log into an admin dashboard to manage the platform and users securely.

#### 2. **User Management**

- As an admin, I want to view a list of all registered users to monitor platform activity.
- As an admin, I want to view details of individual users and their listings, reviews, and transactions.
- As an admin, I want to edit or deactivate user accounts if necessary (e.g., policy violations).

#### 3. **Car Listing Management**

- As an admin, I want to review and approve or reject car listings before they go live on the platform to ensure quality control.
- As an admin, I want to remove any listings that violate platform policies to maintain a safe environment.

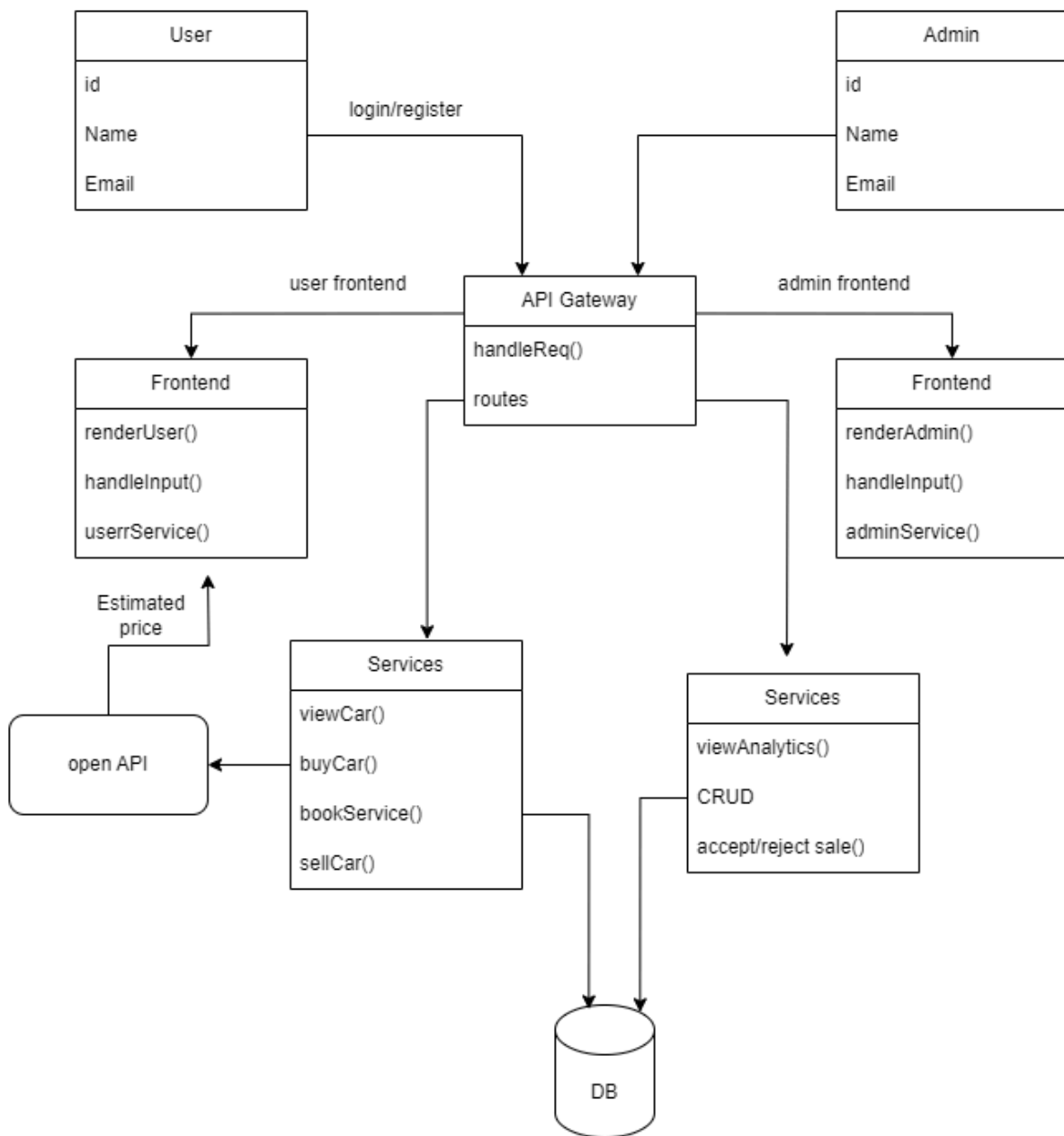
#### 4. **Service Provider Management**

- As an admin, I want to add or approve service providers to ensure they are reputable before listing them on the platform.
- As an admin, I want to remove service providers who do not meet service standards or who violate terms.

#### 5. **Review and Rating Moderation**

- As an admin, I want to monitor user reviews and ratings to ensure they comply with the platform's guidelines.
- As an admin, I want to remove inappropriate or fraudulent reviews to maintain trust.
- 6. Price Estimation Tool Management**
  - As an admin, I want to manage the price estimation tool's parameters or data sources to ensure it remains accurate.
- 7. Transaction Monitoring**
  - As an admin, I want to view all transactions on the platform to monitor for any issues or fraudulent activity.
  - As an admin, I want to generate reports on transactions to gain insights into platform activity and sales.
- 8. Analytics and Reporting**
  - As an admin, I want to view reports on user activity, listings, and service provider performance to evaluate platform health.
  - As an admin, I want to track the most popular cars, services, and providers to identify trends.
  - As an admin, I want to analyze metrics like total listings, total sales, and active users to track growth and performance.
- 9. Notification Management**
  - As an admin, I want to send notifications or announcements to all users about important updates, policy changes, or promotional events.

## UML DIAGRAM



## API Documentation

## 1. User Management Microservice

This service handles user registration, authentication, roles, and profile management.

### API Endpoints:

- **POST** /api/users/register — Register a new user.
- **POST** /api/users/login — Authenticate user and return JWT token.
- **GET** /api/users/me — Get current user profile (requires JWT).
- **PUT** /api/users/me — Update user profile (requires JWT).
- **POST** /api/users/logout — Log out the current user (optional, based on session strategy).

## 2. Car Listings Microservice

This service handles car details, listings for selling, and searching cars.

### API Endpoints:

- **POST** /api/cars — Add a new car to the system (requires user authentication).
- **GET** /api/cars/:carId — Get detailed car information by its ID.
- **PUT** /api/cars/:carId — Update car details (requires authentication).
- **DELETE** /api/cars/:carId — Remove a car from the system (requires authentication).
- **POST** /api/car-listings — List a car for sale (attach car ID and price).
- **GET** /api/car-listings — Retrieve all available car listings.
- **GET** /api/car-listings/:listingId — Get car listing details by listing ID.
- **PUT** /api/car-listings/:listingId — Update a car listing (e.g., modify price).
- **DELETE** /api/car-listings/:listingId — Remove a car listing from sale.

## 3. Price Estimation Microservice

This microservice uses external APIs or internal algorithms to estimate car prices based on their features.

### API Endpoints:

- **POST** /api/price-estimates — Estimate the market price for a car based on its details (make, model, year, mileage, etc.).
- **GET** /api/price-estimates/:carId — Retrieve the previously estimated price for a specific car (optional cache mechanism).

## 4. Service Provider Microservice

This service handles service providers (garages/mechanics) and the services they offer.

### API Endpoints:

- **POST** /api/service-providers — Add a new service provider (for example, a garage or mechanic).

- **GET** /api/service-providers — Get a list of all service providers.
- **GET** /api/service-providers/:providerId — Get details of a specific service provider.
- **PUT** /api/service-providers/:providerId — Update service provider details.
- **DELETE** /api/service-providers/:providerId — Remove a service provider from the system.
- **POST** /api/service-providers/:providerId/services — Add a service offering (like oil change) for the provider.
- **GET** /api/service-providers/:providerId/services — Get all services offered by a provider.
- **PUT** /api/service-providers/:providerId/services/:serviceId — Update service details.
- **DELETE** /api/service-providers/:providerId/services/:serviceId — Remove a service offering.

## 5. Reviews & Ratings Microservice

This microservice handles reviews and ratings for both cars and service providers.

### API Endpoints:

- **POST** /api/reviews — Submit a review for a service provider.
- **GET** /api/reviews — Get all reviews across the platform.
- **GET** /api/reviews/:providerId — Get reviews for a specific service provider.
- **PUT** /api/reviews/:reviewId — Update a review (e.g., edit rating/comment).
- **DELETE** /api/reviews/:reviewId — Delete a review.

## 6. Transaction Management Microservice

This microservice deals with the purchase transactions of cars and their payment processing.

### API Endpoints:

- **POST** /api/transactions — Create a new transaction when a car is purchased.
- **GET** /api/transactions/:transactionId — Get transaction details by transaction ID.
- **GET** /api/transactions — List all transactions made by the current user.

## 7. Notification Microservice (Optional)

If you plan to notify users about listings, service providers, price updates, or successful transactions.

### API Endpoints:

- **POST** /api/notifications — Send notifications to users (could be email/SMS/push).
- **GET** /api/notifications — Retrieve notifications for the current user.
- **PUT** /api/notifications/:notificationId/read — Mark a notification as read.

## 8. Analytics & Reporting Microservice

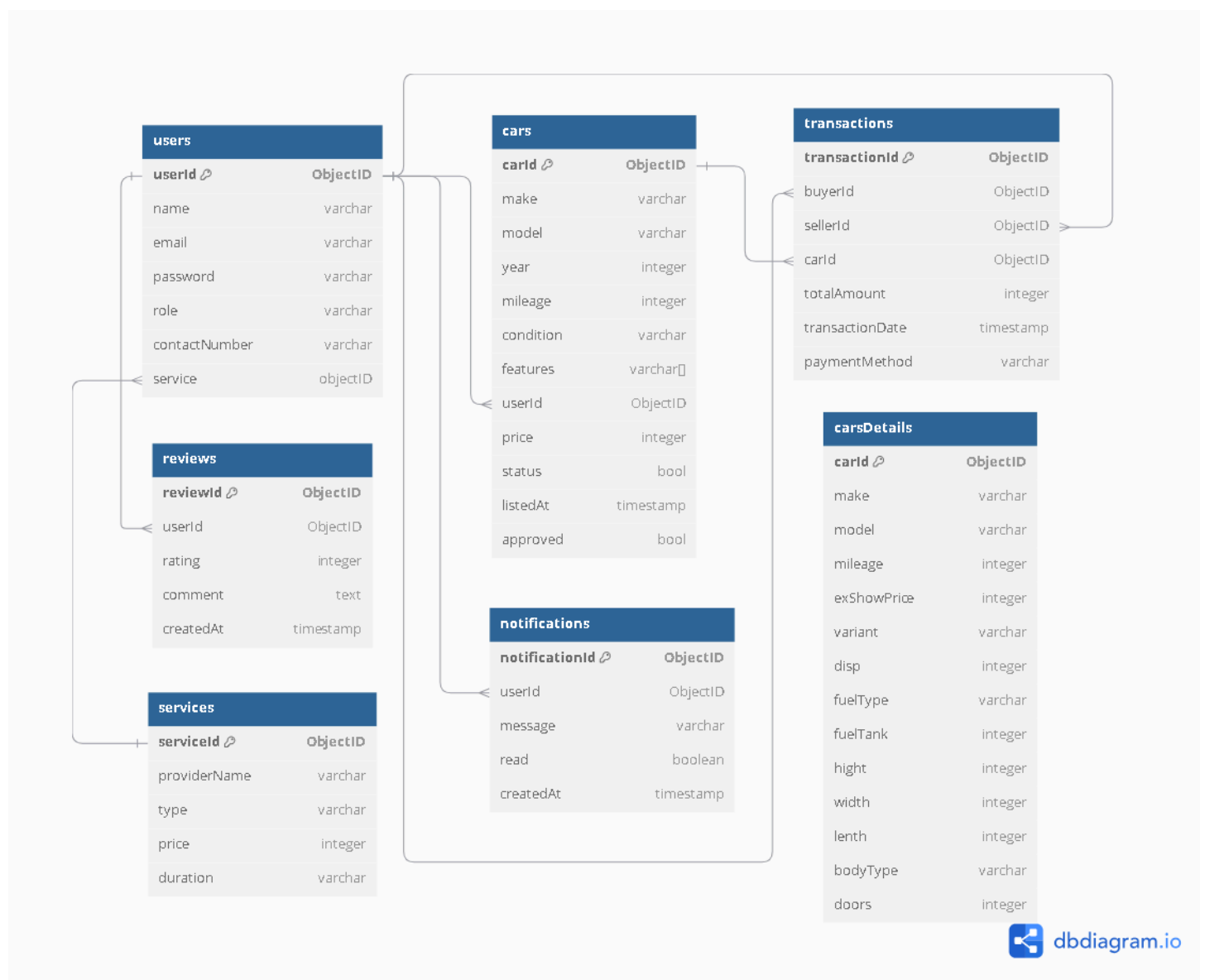
To generate reports or analytics (e.g., total car listings, best-selling cars, popular service providers, etc.).



## API Endpoints:

- **GET** /api/analytics/listings – Get analytics about car listings (e.g., total listings, top 10 brands).
- **GET** /api/analytics/providers – Get analytics about service providers (e.g., top-rated providers).

## Schema Diagram



## WireFrame

Featured Cars

Explore some of our top listings

View All Cars

Price: \$40,000

Luxury Sedan

BMW 5 Series  
Year: 2021, Mileage: 20,000km

Price: \$90,000

Sports Car

Porsche 911  
Year: 2019, Mileage: 15,000km

Price: \$35,000

SUV

Toyota Highlander  
Year: 2018, Mileage: 30,000km

Book a Service

Schedule a service for your car

Car Model

Enter car model  
e.g. Honda Accord

Service Type

Oil Change

Tire Rotation

Brake Inspection

Select service type

Book Service

Latest Reviews

See what our customers are saying

Write a Review

Welcome to CarHub

Explore our wide range of cars and services

Search for cars

Log In

Sign Up

Featured Cars

Luxury Sedan

2022 Model

Experience luxury and performance like never b...

New Arrival

CarHub Team

SUV Adventure

Limited Edition

Conquer the roads with style and comfort

Popular Choice

CarHub Team

Classic Vintage

Collector's Dream

Own a piece of automotive history

Rare Find

CarHub Team

Car Marketplace

Home

Cars

Sell Car

Profile

Services

Search in site

Welcome to Car Marketplace

Buy or sell cars easily on our platform

Search for a car...

Register

Login

## Available Cars



Toyota Camry  
Used, 2018

\$15,000



Honda Civic  
New, 2020

\$20,000



Ford Mustang  
Used, 2016

\$25,000

## Featured Cars

New Arrival

Sport Car

Lamborghini Aventador  
\$300,000

Top Seller

Luxury SUV

Range Rover Velar  
\$80,000

## Sell Your Car

Fill in the details below to sell your car

Car Model

Enter car model

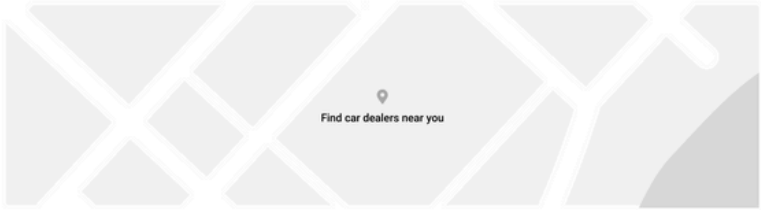
Asking Price

Enter your asking price

Upload Images

Maximum of 5 images

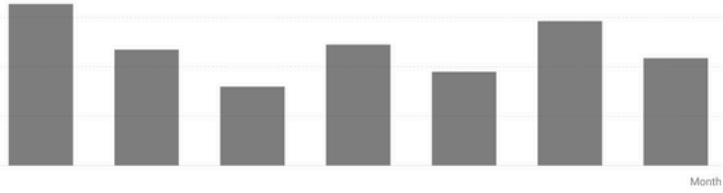
Submit



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#### Sales performance

Revenue



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