

# Vehicle Management System – Service Reservation Platform

**Status:** Full-Stack Web Application

A complete **Vehicle Management System** designed to streamline the workflow of automobile service centers. The system enables **customers to book vehicle services**, **managers to assign technicians and monitor operations**, **technicians to update job status**, and **administrators to manage users and service inventory**, ensuring smooth service delivery, accurate billing, and detailed performance reporting.

## Features

### 1. Customer Features

- **Book Vehicle Service:** Submit service requests with vehicle details and issue description.
- **My Services Dashboard:** View service status, service history, and invoices.
- **Service Tracking:** Track lifecycle – Requested → Assigned → In Progress → Completed → Closed.
- **Billing History:** View generated bills and payment status.

### 2. Technician Features

- **Assigned Jobs List:** View all allocated service tasks.
- **Update Job Status:** Change job progress and add remarks.
- **Parts Usage:** Record parts consumed during servicing.

### 3. Manager Features

- **Technician Assignment:** Assign technicians to pending service requests.
- **Workload Monitoring:** Track technician performance and active jobs.
- **Service Reports Dashboard:** View daily, monthly service statistics.

## 4. Admin Features

- **User Management:** Create users and assign roles (Admin, Manager, Technician, Customer).
- **Service & Pricing Configuration:** Manage service types and charges.
- **System Reports:** View revenue, technician performance, and service trends.
- **Security & RBAC:** Role-Based Access Control to prevent unauthorized access.

## Technology Stack

### Backend

- **Framework:** ASP.NET Core Web API (.NET 8 / 9)
- **Database:** Microsoft SQL Server
- **ORM:** Entity Framework Core (Code-First)
- **Authentication:** JWT Authentication with Role-Based Authorization
- **Testing:** xUnit
- **Documentation:** Swagger / OpenAPI

### Frontend

- **Framework:** Angular (Standalone Components)
- **UI Library:** Angular Material / Bootstrap
- **Charts:** Chart.js / ng2-charts
- **State Management:** Angular Signals
- **Forms:** Reactive Forms
- **HTTP Handling:** HttpClient & Interceptors

## System Architecture

The system follows a **clean N-Tier architecture**:

- **Presentation Layer:** Angular SPA
- **API Layer:** RESTful APIs with DTOs and Global Exception Handling
- **Service Layer:** Business logic implementation
- **Data Access Layer:** EF Core with Repository Pattern

# Setup Instructions

## Pre-requisites

- Node.js v18+
- .NET SDK 8 / 9
- SQL Server (LocalDB / Express)

## 1. Database Setup

```
cd VehicleManagementAPI
dotnet ef database update
```

Update the connection string in `appsettings.json` if needed.

## 2. Backend API Setup

```
dotnet run
```

- API URL: `https://localhost:5289`
- Swagger: `https://localhost:7290/swagger`

## 3. Frontend Setup

```
cd vehicleUI
npm install
ng serve -o
```

Application will run at:

`http://localhost:4200`

# Testing

## Unit Testing

```
dotnet test
```

Includes test cases for:

- AuthController
- ServiceController
- TechnicianController
- ManagerController
- BillingController

## Seed Data - User Credentials

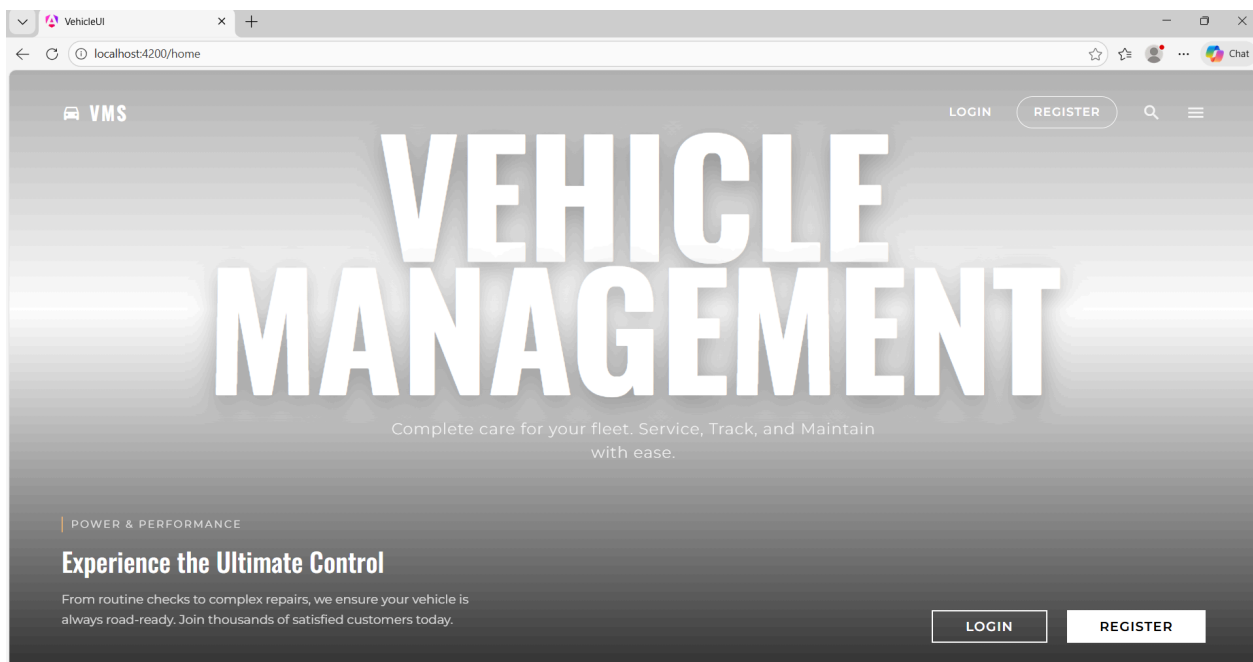
- Admin - admin@vehicleservice.com, Admin@123

## LINQ & Reporting

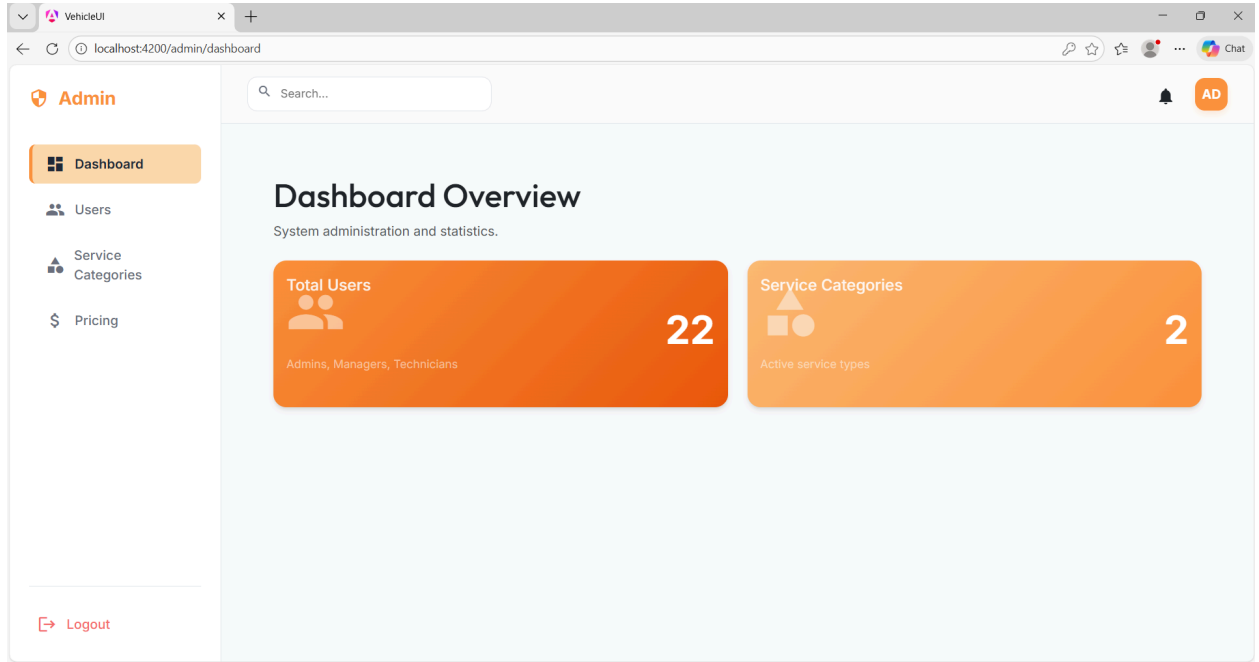
- Filter services by status, date, or priority
- Group services by technician and vehicle type
- Revenue aggregation per month
- Technician performance analysis

## Screenshots

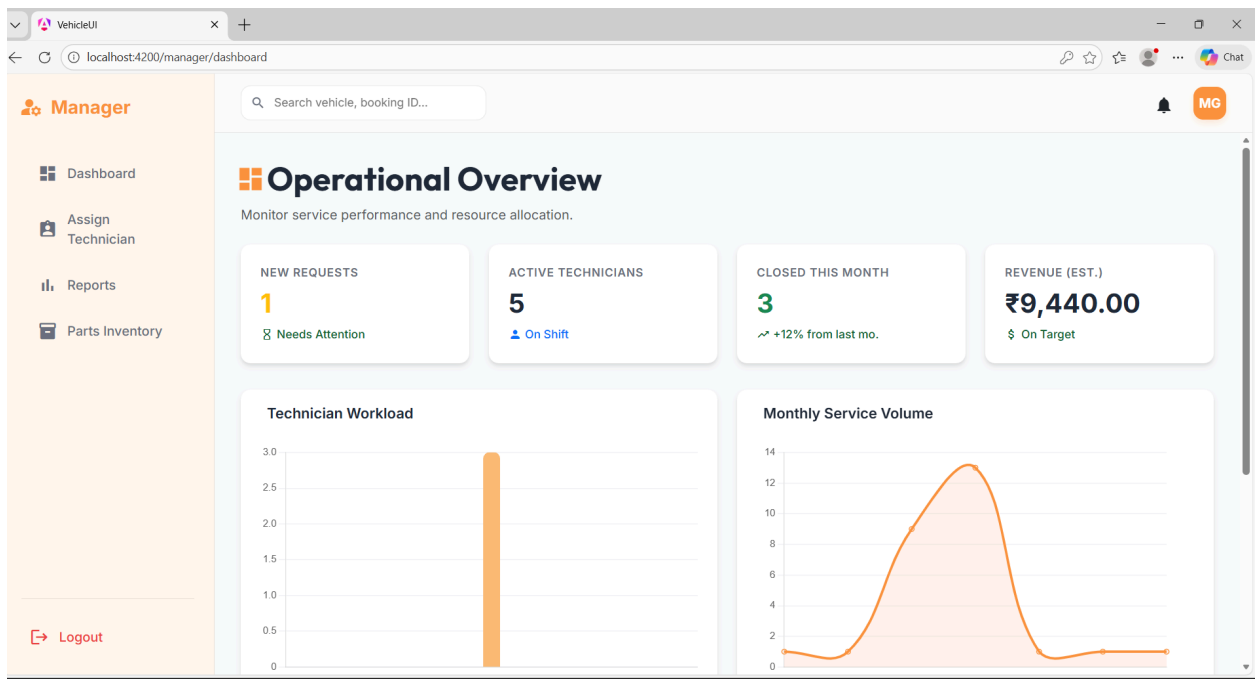
### 1. Home Screen



## 2. Admin Dashboard



## 3. Manager Dashboard



#### 4. Technician Dashboard

VehicleUI

localhost:4200/technician/dashboard

Technician

My Dashboard

Search job ID, vehicle...

Hello, User! 🛠️

Manage your assigned service requests and current tasks.

Active Tasks  
Manage your currently assigned jobs

ID	Vehicle	Issue	Priority	Status	Actions
#6	ap-12-ndkv	break failure	Urgent	In Progress	Parts Complete
#23	Mh-12-AB-7274	sifjg9oerjhoikth	Urgent	In Progress	Parts Complete
#27	Mh-12-AB-7274	engie noise	Normal	Assigned	Start Job

#### 5. Customer Dashboard

VehicleUI

localhost:4200/customer/dashboard

Customer

My Dashboard

My Vehicles

Book Service

Add Vehicle

My Bills

My Bookings

Logout

Search vehicle or booking ID...

ACTIVE REQUESTS  
18  
In Progress

MY VEHICLES  
6  
Registered

PENDING PAYMENTS  
₹2.00  
Action Required

TOTAL SPENT  
₹1,250.00  
Lifetime Value

Service Status Distribution

Quick Actions

Book New Service

Add Vehicle

View All Services

Active Completed Pending



## Contributors

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