

CarGo Delivery App

Student Work	
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1. Introduction

The CarGo Delivery App was developed in response to the growing demand for a streamlined and convenient car buying and delivery experience. Recognizing the needs of modern consumers, the app offers a comprehensive platform that seamlessly connects customers, dealers, and delivery drivers. Through an intuitive interface, users can effortlessly browse vehicles, schedule test drives, and complete purchases, all from the comfort of their homes. The CarGo Delivery App revolutionizes the traditional car buying process by providing real-time inventory updates, secure online transactions, and GPS-enabled delivery tracking, ensuring a smooth and efficient experience for all parties involved.

1.1. Software Overview and Purpose

1.2. This Document (first draft) Purpose

2. Project Planning

2.1. Software Features

1. Vehicle Browsing: Extensive catalog with advanced search and filtering options for efficient car selection.
2. Real-time Inventory: Up-to-date information from multiple dealers, ensuring accurate availability.
3. Online Purchasing: Secure transactions and financing options for a seamless buying experience.
4. Test Drive Scheduling: Easy booking of test drives at convenient locations or with home delivery options.
5. Home Delivery: Schedule and track vehicle deliveries in real-time using GPS technology.
6. Dealer Management: Comprehensive tools for inventory management and order processing.
7. Driver Coordination: Optimized delivery routes and status update features for efficient logistics.

2.2. Define the Audience

Customers: Individuals looking to purchase vehicles with a preference for convenience and digital solutions. Dealers: Car dealerships aiming to expand their reach and streamline their sales process through digital platforms. Delivery Drivers: Professional drivers seeking flexible work opportunities in vehicle delivery services.

2.3. Documentation Assumptions

This documentation assumes:

- Users have basic smartphone proficiency and can navigate mobile applications.
- Users are comfortable with online transactions and digital communication.
- The audience comprises individuals with varying levels of car-buying experience, from first-time buyers to seasoned purchasers.
- Dealers have a basic understanding of inventory management systems.
- Delivery drivers are familiar with GPS navigation and mobile communication tools.

2.4. Validate Your Assumptions (Gap Analysis)

A gap analysis will identify discrepancies between user needs and application features:

- User Experience: The app's interface is intuitive for users with varying levels of tech-savviness, from first-time car buyers to experienced dealerships.
- Feature Completeness: Essential features such as vehicle browsing, real-time inventory updates, secure online purchasing, and delivery tracking are included.
- Accessibility: The app is usable by individuals with disabilities, providing necessary support features like voice commands and screen reader compatibility.
- Multi-platform Support: The app functions consistently across various devices and operating systems, including smartphones, tablets, and web browsers.
- Integration Capabilities: The system seamlessly integrates with existing dealer management systems and financial institutions for a smooth transaction process.

2.5. Software Requirements (use SRS Doc)

The software requirements for the CarGo Delivery App include:

- Functional Requirements:
 - User authentication and profile management for customers, dealers, and drivers.
 - Advanced vehicle search and filtering capabilities.
 - Real-time inventory synchronization across multiple dealerships.
 - Secure online transaction processing with multiple payment options.
 - Test drive scheduling and management system.
 - GPS-enabled real-time delivery tracking.

- In-app messaging system for communication between customers, dealers, and drivers.
- Non-Functional Requirements:
 - Performance metrics such as app load times, search response times, and real-time update frequencies.
 - Security protocols, including data encryption, secure payment gateways, and multi-factor authentication.
 - Scalability to handle increasing numbers of users, vehicles, and transactions.
 - Reliability with a system uptime of at least 99.9%.
 - Usability standards to ensure an intuitive user experience across all user types.
 - Compliance with automotive industry regulations and data protection laws.

2.6. Build Personas, Stories, and Journey Maps (Use Persona Document)

2.6.1. Personas

Sara Althubaity

I aspire to use my knowledge and skills to contribute to innovative projects that have a positive impact on society.

Education

- Bachelor of Computer Science
- Umm Al-Qura University

Skills

- Programming Languages (Python, Java)
- Web development
- DataBases
- Project Management
- Problem Solving

Language

- Arabic
- English

Computer Science

They Gain Information by

- Conferences and Meetups
- Online Courses and Tutorials

Goals or objectives

- Neom
- Aramko

Motivations

- Creativity and Innovation.
- Diverse Project Work.
- Impact on Users
- Biggest Challenges
- Rapid Technological Evolution.
- Time Management.
- Adaptability to Change.

Mayas Alakbary

I am passionate about front-end development and enjoy designing attractive and user-friendly interfaces. I am always eager to learn new techniques and improve my skills, and I am capable of delivering exceptional user experiences. I also strive to make the web a more appealing and accessible place for everyone.

Education

- Bachelor of Computer Science
- Umm Al-Qura University

Skills

- Proficient in HTML, CSS, and JavaScript
- Expertise in Frontend Frameworks (React, Angular)
- Strong understanding of Cross-Browser Compatibility

Language

- Arabic
- English

Computer Science

They Gain Information by

- Participating in online courses and tutorials
- Participating in meetups and conferences

Goals or objectives

- Aramco
- Build intuitive and efficient user interfaces

Motivations

- Creativity and Design.
- User Interaction.
- Biggest Challenges
- Work Pressure and Deadlines.
- High Competition.

Fouz Alsharif

I love exploring areas such as artificial intelligence and software development. I chose to study computer science because it gives me the opportunity to learn how to solve complex problems using technology.

Education

- Bachelor of Computer science
- Umm Al-Qura University

Skills

- Problem Solving
- Management
- Programming Languages.
- DataBases

Language

- Arabic
- English

Computer Science

They Gain Information by

- Online Courses and Tutorials
- Forums and Communities
- YouTube Channels

Goals or objectives

- SABIC
- I want to learn more programming languages

Motivations

- Interest in Technology
- Career Opportunities
- Logical Thinking and Mathematics
- Biggest Challenges
- Scalability and Performance
- Data Privacy

Lama Aloufi

I enjoy exploring areas such as game development, data analysis, and cybersecurity. I chose this field because it enables me to learn how to use technology to tackle various challenges and make a positive impact in the world.

Education

- Bachelors of Computer science
- Umm Al-Qura University

Skills

- Technical Writing Software
- Management
- Programming [Python, Java]

Language

- Arabic
- English

Computer Science

They Gain Information by

- Reading documentation and online resources.
- Hands-on coding and experimentation.
- Taking courses and collaborating with colleagues.

Goals or objectives

- Solving tough problems and learning new tech.
- SABIC

Motivations

- Curiosity, a love for problem-solving.
- Career growth and recognition.
- Biggest Challenges
- Finding and fixing bugs.
- Keeping up with the latest technologies.

2.6.2. User Stories

- **As a customer**, I need to view detailed, high-quality images and videos of available cars to assess their condition and features before making a decision.
- **As a customer**, I need to track the status and location of the car during delivery in real-time to stay informed.
- **As a customer**, I need to see the availability of different cars and receive a notification if a desired model becomes available for delivery.
- **As a customer**, I need clear information on return or exchange policies in case the delivered car doesn't meet my expectations.
- **As a customer**, I need multiple flexible payment options such as installments or leasing to make the car purchase more manageable.
- **As a customer**, I need access to 24/7 customer support in case there are any issues during or after delivery.
- **As a delivery driver**, I need an optimized route to ensure timely and efficient delivery of the car to the customer.
- **As a delivery driver**, I need real-time updates and notifications if a delivery needs to be rescheduled or rerouted.
- **As a car dealer**, I need to monitor inventory and ensure cars are available for quick delivery without long wait times.
- **As a car dealer**, I need to maintain detailed records of all car deliveries to ensure smooth operations and manage customer satisfaction.

3. Technical Documentation

3.1. Software Architecture Design (SDD)

3.1.1. System Architecture Overview

The CarGo Delivery App uses a client-server model. It's designed to be secure, scalable, and efficient for car browsing, buying, and delivery. Here are the main parts:

1. **User Apps (iOS, Android, Web)**: People use these to look at cars, book test drives, buy vehicles, and track deliveries. The apps talk to the backend using secure internet connections.
2. **Backend Server**: This is the brain of the app. It runs on cloud services like AWS or Azure. It handles user requests, manages car listings, processes orders, and schedules deliveries.

3. **Database:** Stores all app data like user profiles, car details, orders, and delivery schedules. It uses systems like PostgreSQL or MongoDB to keep data safe and up-to-date.
4. **Authentication Service:** Checks if users are who they say they are. It uses secure methods like OAuth +0 or JWT to protect user accounts.
5. **Load Balancer:** Spreads out user requests to different servers. This stops any one server from getting too busy and keeps the app running smoothly.
6. **Payment System:** Connects to services like PayPal or Stripe for safe money transfers when people buy cars.
7. **GPS Tracking:** Lets customers see where their car is during delivery. It works with drivers' phones to show real-time locations.
8. **Real-time Updates:** Uses tech like WebSockets to instantly update things like car availability and order status.
9. **Notification Service:** Sends messages to users about their orders, deliveries, and other important info via push notifications, texts, or emails.
10. **Content Delivery Network (CDN):** Quickly sends pictures and videos of cars to users, no matter where they are.
11. **Analytics Tool:** Collects data on how people use the app. This helps improve the app over time.
12. **External API Integrations:** Links to other services for things like car history reports, loans, and insurance quotes.

This setup helps CarGo work well for customers, car dealers, and delivery drivers. It's built to grow as more people use it and to easily add new features in the future.

3.2. Plan Your Documentation (Choose the Right Content Types)

3.2.1. Readme and Troubleshooting

3.2.1.1. Application Purpose

The CarGo Delivery App (CDA) aims to:

- Browse Vehicles: Explore a wide range of cars with detailed info and high-quality images.
- Buy Cars Online: Make secure car purchases directly through the app.

- Book Test Drives: Schedule test drives at convenient locations or request home delivery.
- Track Deliveries: Monitor real-time location and status of vehicle deliveries using GPS.
- Manage Inventory: For dealers to efficiently update and manage vehicle listings and orders.
- Coordinate Deliveries: For drivers to optimize routes and provide status updates to customers.

3.2.1.2. Installation Instructions

To install and use the CarGo Delivery App:

1. Download the App:
 - Find “CarGo Delivery” on the App Store (iOS) or Google Play (Android).
 - For web users, go to www.cargodelivery.com.
 - Download and install the app on your device.
2. Create an Account (new users):
 - Open the app and tap “Sign Up.”
 - Select your user type: Customer, Dealer, or Driver.
 - Fill in your details and upload verification documents (for dealers and drivers).
 - Verify your email using the link sent to you.
3. Log In (existing users):
 - Open the app and enter your email and password.
 - Use “Forgot Password” if needed.
4. Access Features:
 - Customers: Browse cars, book test drives, and track orders from the main screen.
 - Dealers: Use the “Dealer Portal” to manage inventory and handle orders.
 - Drivers: Access the “Driver Dashboard” for delivery assignments.

3.2.1.3. Common Troubleshooting Tips

- Internet Issues: Check your connection for smooth app use.
- Account Problems: Make sure your email is verified to use all features.
- Payment Failures: Try a different payment method or check with your bank.
- Location Tracking: Turn on GPS for accurate delivery tracking and test drive scheduling.

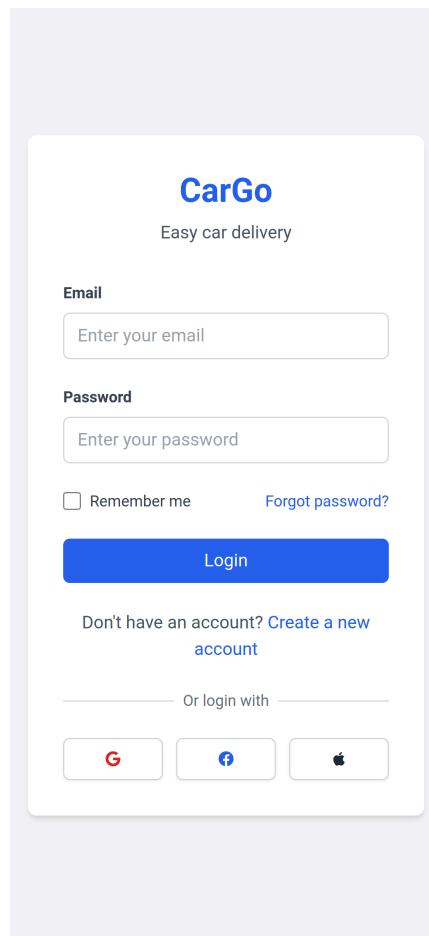
- App Performance: Keep the app updated for best performance and new features.
- Device Support: Make sure your device meets the requirements (iOS 13.0+ or Android 8.0+).
- Image Loading: If car pictures won't load, try clearing the app cache or restarting it.
- Dealer Account: Submit all required documents for account approval.
- Driver Verification: Be patient during background check processing.

3.3. Adding visual content

3.3.1. Key Interfaces for CarGo Delivery App

3.3.1.1. USER INTERFACES

3.3.1.1.1. Login Interface



The login interface serves as the entry point for all users.

The login page appears as a clean, modern design that fits well with a mobile application aesthetic. It contains two main data entry fields: an email field for

entering the username or email address, and a password field for entering the user's password. The user can enter their personal information into these two fields.

There is a "Remember me" checkbox option, allowing the user to save their login information for quicker access in the future. A prominent "Log in" button is included at the bottom of the form, which would be used to submit the entered information and verify the user's credentials.

Additional features include the CarGo logo and a brief description at the top, links for password recovery and new account creation, and social login options (Google, Facebook, Apple) provided at the bottom. The interface is designed to be responsive and user-friendly, with clear labels and placeholder text to guide the user through the login process.

3.3.1.1.2. User Registration Interface

The screenshot shows the 'CarGo' user registration form. It includes fields for 'Full Name', 'Email', 'Phone Number', 'Password', 'Confirm Password', and 'Account Type' (radio buttons for Customer, Dealer, or Driver). A large blue 'Create Account' button is at the bottom, and a link to 'Log in' is below it.

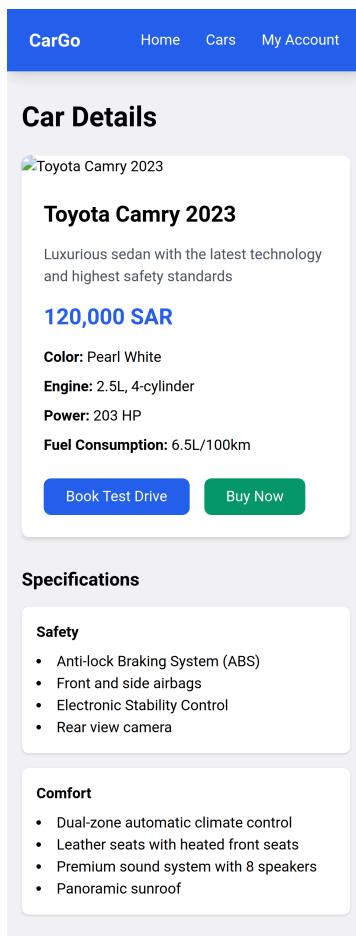
Guides new users through the account creation process.

3.3.1.1.3. Vehicle Browsing Interface

The screenshot shows the 'Browse Cars' section of the CarGo website. It features a search bar, dropdown menus for 'Brand' and 'Year', and a grid of vehicle cards. The first card is for a 'Toyota Camry 2023' (Luxury sedan) priced at '120,000 SAR'. The second card is for a 'Honda Accord 2022' (Comfortable family car) priced at '110,000 SAR'. The third card is for a 'Ford Mustang 2023' (Powerful sports car) priced at '180,000 SAR'. Each card has a 'Details' button. At the bottom, there are navigation links for 'Previous', page numbers '1', '2', '3', and 'Next'.

Allows customers to explore available vehicles efficiently.

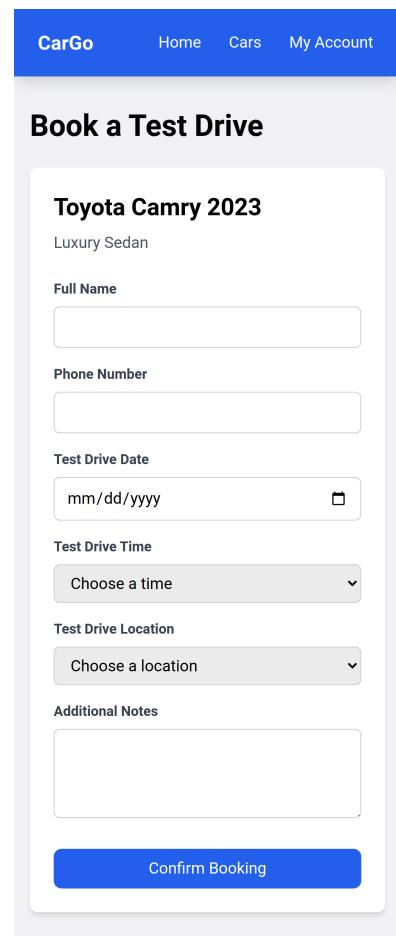
3.3.1.1.4. Vehicle Detail Interface



The screenshot shows the CarGo vehicle detail interface. At the top, there's a blue header bar with the 'CarGo' logo and navigation links for 'Home', 'Cars', and 'My Account'. Below the header, the page title 'Car Details' is displayed. A thumbnail image of a Toyota Camry 2023 is shown, followed by the car's name. A brief description states it's a 'Luxurious sedan with the latest technology and highest safety standards'. The price is listed as '120,000 SAR'. Technical specifications include color (Pearl White), engine (2.5L, 4-cylinder), power (203 HP), and fuel consumption (6.5L/100km). Two buttons at the bottom are 'Book Test Drive' (blue) and 'Buy Now' (green). On the left, under 'Specifications', there are two sections: 'Safety' (listing ABS, airbags, ESC, and rear view camera) and 'Comfort' (listing climate control, heated seats, sound system, and sunroof).

Provides comprehensive information about a selected vehicle.

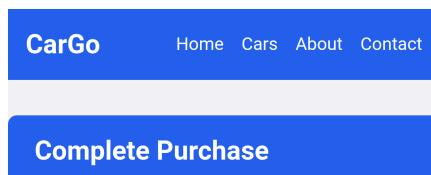
3.3.1.1.5. Test Drive Scheduling Interface



The screenshot shows the CarGo test drive scheduling interface. At the top, there's a blue header bar with the 'CarGo' logo and navigation links for 'Home', 'Cars', and 'My Account'. Below the header, the page title 'Book a Test Drive' is displayed. A section for the 'Toyota Camry 2023' is shown, identifying it as a 'Luxury Sedan'. The form fields for booking include 'Full Name' (text input), 'Phone Number' (text input), 'Test Drive Date' (date input with a calendar icon), 'Test Drive Time' (dropdown menu), 'Test Drive Location' (dropdown menu), and 'Additional Notes' (text area). A large blue 'Confirm Booking' button is located at the bottom right.

Facilitates easy scheduling of test drives.

3.3.1.1.6. Purchase and Checkout Interface



Car Summary

Car Image
Toyota Camry 2024
Silver | 2.5L | Automatic
120,000 SAR

Financing Options

- Full Payment
- Bank Financing
- Lease to Own

Delivery Details

Address
Enter delivery address

Preferred Delivery Date
mm/dd/yyyy

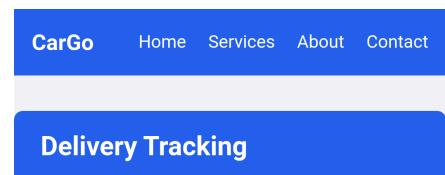
Payment Information

Card Number
***** * * * *

Expiration Date CVV

Guides customers through the vehicle purchase process.

3.3.1.1.7. Delivery Tracking Interface



Tracking Map

Expected Arrival Time: **15:30**

Driver Details

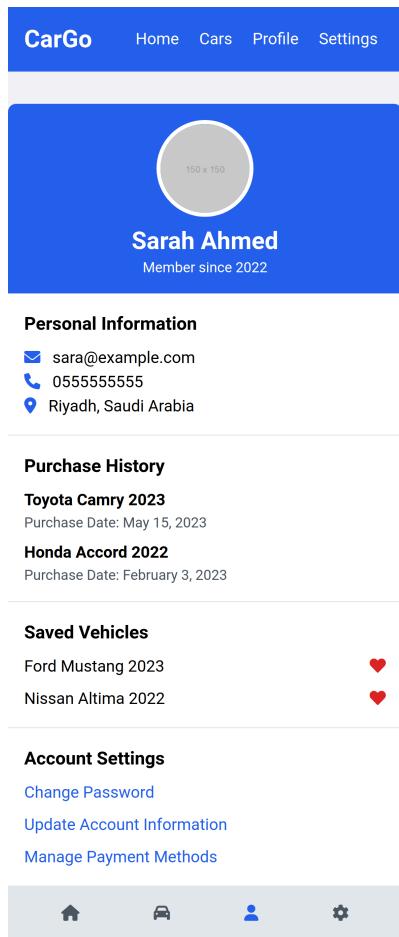
Ahmed Mohammed
Driver Vehicle Number: ABC 123

Call

Message

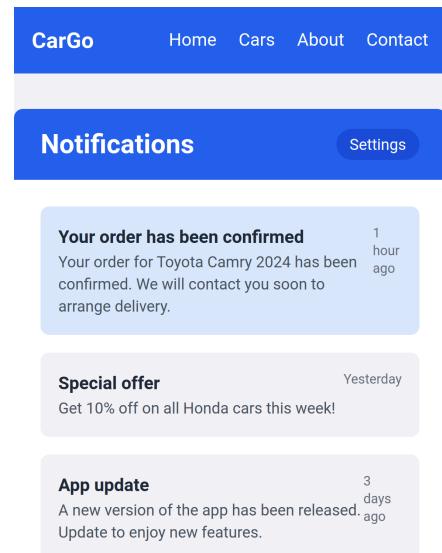
Allows customers to track their vehicle delivery in real-time.

3.3.1.1.8. User Profile Interface



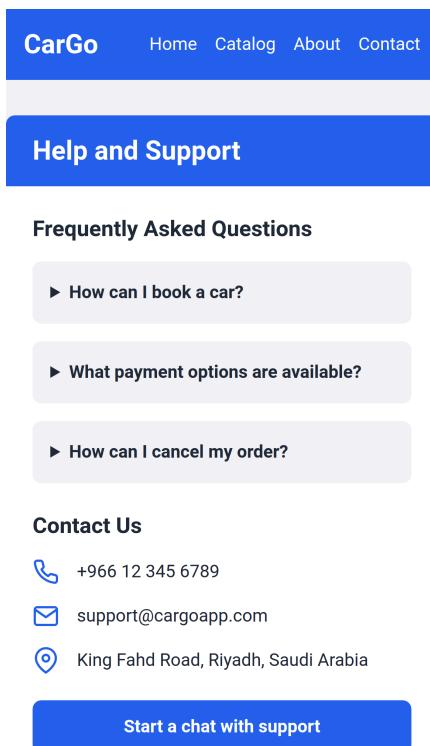
Provides users with access to their personal information and app preferences.

3.3.1.1.9. Notifications Center



Keeps users informed about important updates and events.

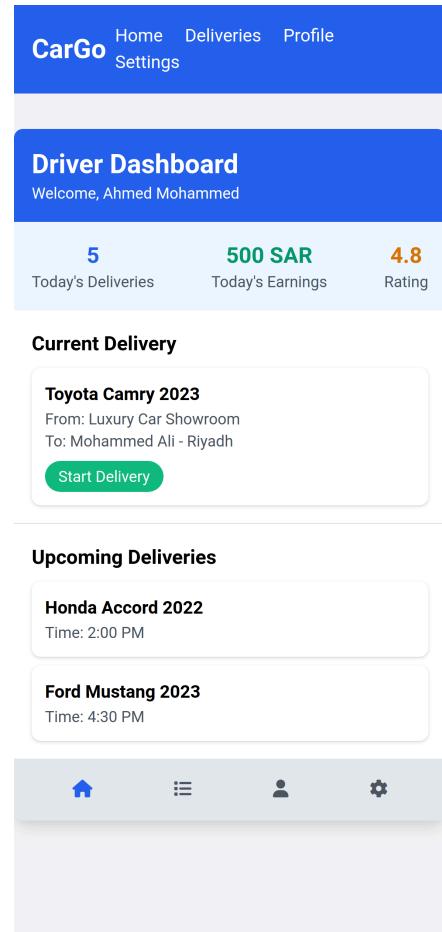
3.3.1.1.10. Help and Support Interface



Offers assistance and answers to common user questions.

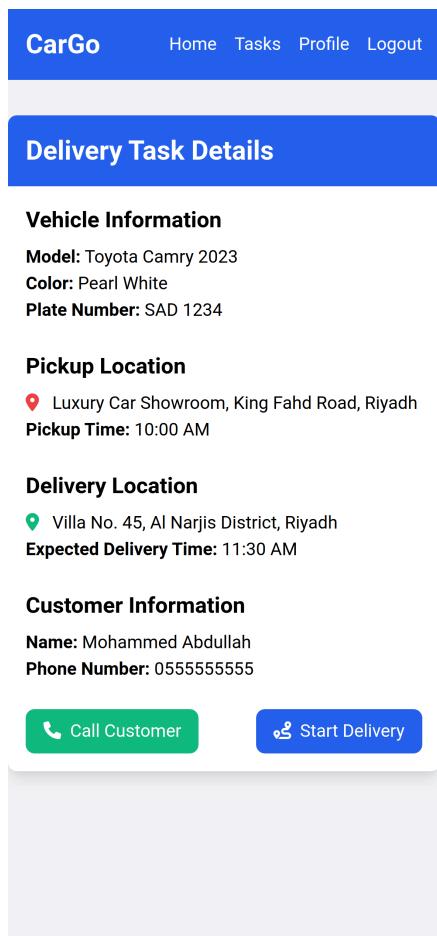
3.3.1.2. DRIVER INTERFACES

3.3.1.2.1. Driver Dashboard



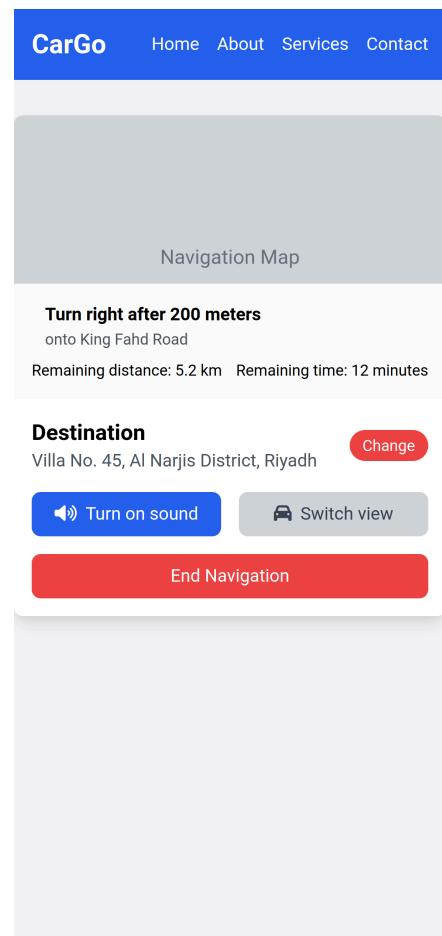
Central hub for drivers to manage their work and performance.

3.3.1.2.2. Delivery Task Details



Provides drivers with all necessary information for a delivery task.

3.3.1.2.3. Navigation Interface



Assists drivers in efficiently navigating to pickup and drop-off locations.

3.3.1.2.4. Status Update Interface

CarGo Home Orders Profile Logout

Update Delivery Status

Order Information

Order Number: #12345
Customer: Mohammed Abdullah
Car: Toyota Camry 2023

Current Status

In Transit

Update Status

Picked Up In Transit

Delivered Issue

Add Note

Enter any additional notes here...

Confirm Update

Allows drivers to keep customers and the system informed about delivery progress.

3.3.1.2.5. Driver Earnings Interface

CarGo Home Earnings My Account

Driver Earnings

Earnings Summary

Earnings this week Earnings this month
1,250 SAR 5,800 SAR

Recent Trips

Trip #1234	75 SAR
May 15, 2023	
Trip #1235	60 SAR
May 14, 2023	
Trip #1236	90 SAR
May 13, 2023	

Performance Metrics

Rating	4.8 ★
Trip acceptance rate	95%
Completed trips	127

Provides transparency on driver compensation and financial information.

3.3.1.3. DEALER INTERFACES

3.3.1.3.1. Dealer Dashboard

CarGo Home Inventory Orders My Account

Merchant Dashboard

Total Sales 1,250,000 SAR	Number of Cars Sold 45
-------------------------------------	----------------------------------

Recent Orders

Order #5678 Toyota Camry 2023	120,000 SAR
Order #5679 Honda Accord 2022	110,000 SAR
Order #5680 Ford Mustang 2023	180,000 SAR

Inventory Summary

Total Cars	150
Available Cars	120
Reserved Cars	25
Cars in Maintenance	5

Central hub for dealers to manage their business on the platform.

3.3.1.3.2. Inventory Management Interface

CarGo Home Inventory Orders My Account

Inventory Management

Search for a car...

Brand: **Toyota**

Status: **Available**

Car	Model	Price	Status
Toyota Camry	2023	120,000 SAR	Available
Honda Accord	2022	110,000 SAR	Reserved
Ford Mustang	2023	180,000 SAR	Under Maintenance

+ Add New Vehicle

Allows dealers to keep their vehicle listings up-to-date.

3.3.1.3.3. Order Processing Interface

Order Processing

#12345 Pending
Ahmed Mohammed - Toyota Camry 2023
Order Date: May 15, 2023
120,000 SAR Accept Reject

#12346 Processing
Fatima Ali - Honda Accord 2022
Order Date: May 14, 2023
110,000 SAR Update Status

#12347 Completed
Khalid Omar - Ford Mustang 2023
Order Date: May 13, 2023
180,000 SAR View Details

Previous 1 2 3 Next

Facilitates efficient handling of customer orders.

3.3.1.3.4. Pricing and Promotions Interface

Pricing and Promotions

Modify Prices

Select Car
Toyota Camry 2023

New Price
Enter new price

Update Price

Create Promotion

Promotion Name
Enter promotion name

Discount Percentage
Enter discount percentage

Start Date
mm/dd/yyyy

End Date

Enables dealers to implement pricing strategies and special offers.

3.3.1.3.5. Customer Relationship Management (CRM) Interface

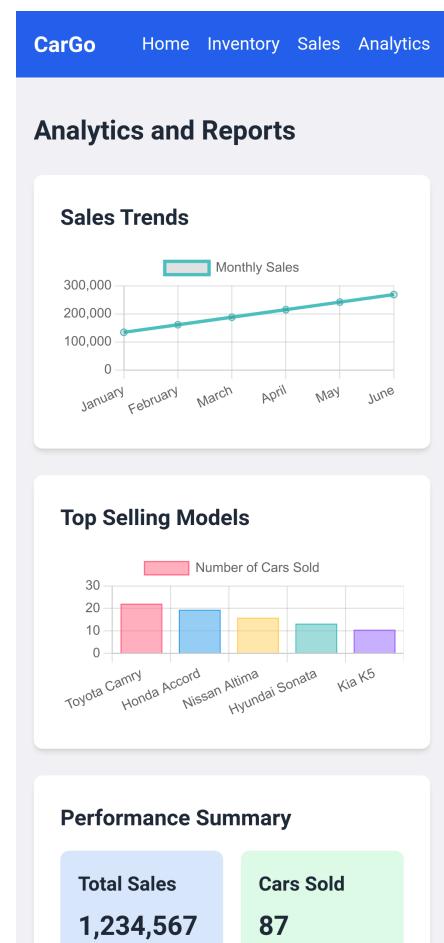
The screenshot shows the CarGo CRM interface. At the top, there's a blue header bar with the 'CarGo' logo and navigation links for Home, Customers, Reports, and Settings. Below the header, the main content area has a title 'Customer Relationship Management'. On the left, there's a 'Customer List' card containing a table with three rows of data:

Name	Email
Ahmed Mohamed	ahmed@example.com
Fatima Ali	fatima@example.com
Mohammed Khalid	mohammed@example.c

On the right, there's an 'Add Customer Note' card with a dropdown menu set to 'Ahmed Mohamed' and a text input field placeholder 'Enter note here'.

Helps dealers manage and nurture customer relationships.

3.3.1.3.6. Analytics and Reporting Interface



Provides insights to inform business decisions and strategies.

3.3.1.3.7. Test Drive Management Interface

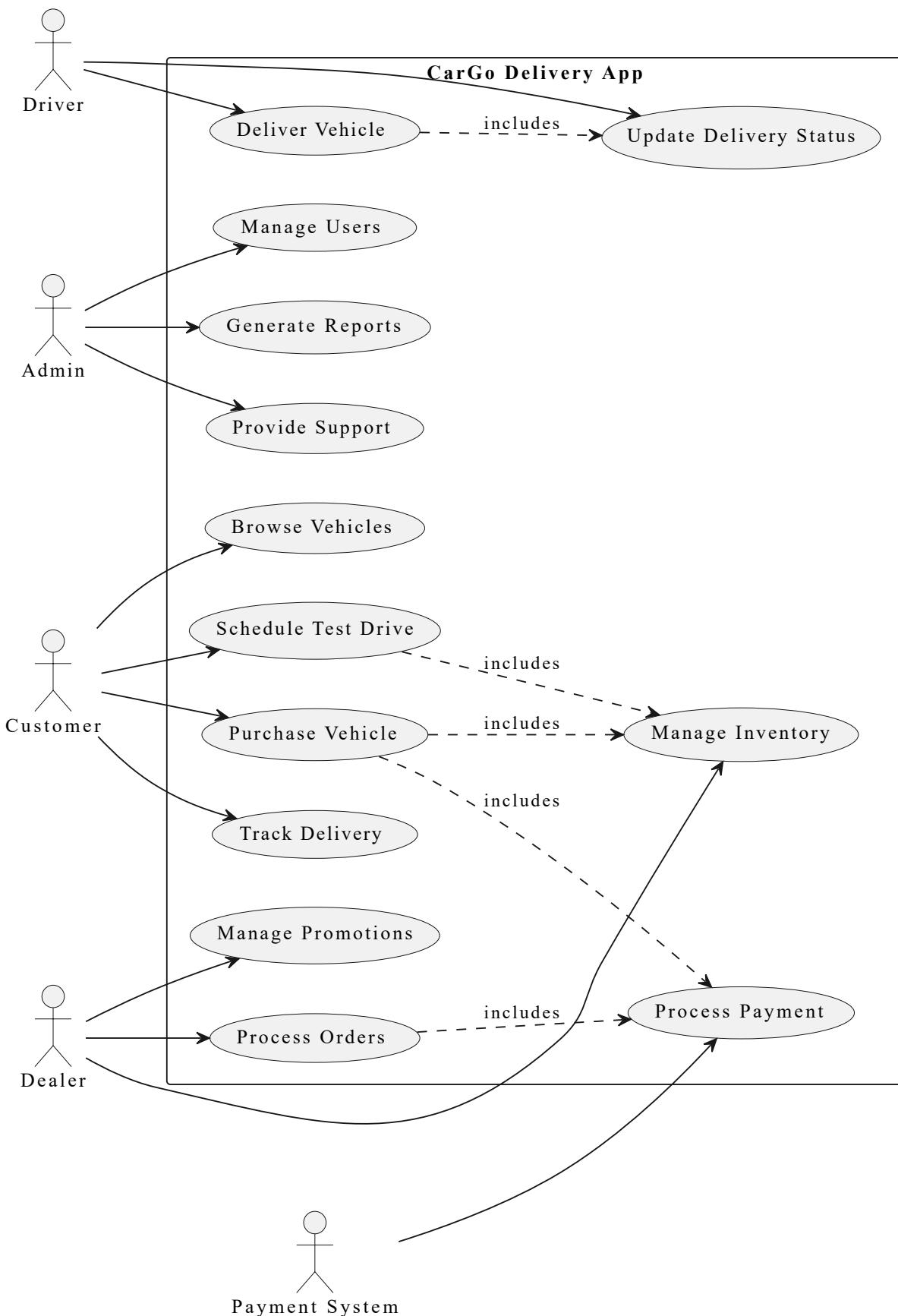
The screenshot shows the 'Test Drive Management' section of the CarGo application. At the top, there's a navigation bar with links for Home, Vehicles, Test Drives, and Contact. Below the navigation is a title 'Test Drive Management'. A 'Test Drive Schedule' section contains a table with three rows of data:

Date	Time	Customer	Veh
2023-05-20	10:00 AM	Ahmed Mohammed	Toyota Camry 202
2023-05-21	2:30 PM	Fatima Ali	Honda Civic 202
2023-05-22	11:15 AM	Mohammed Khalid	Nissan Altir 202

Below the schedule is a 'Schedule a New Test Drive' form. It includes fields for Date (mm/dd/yyyy), Time (hh:mm), and Customer.

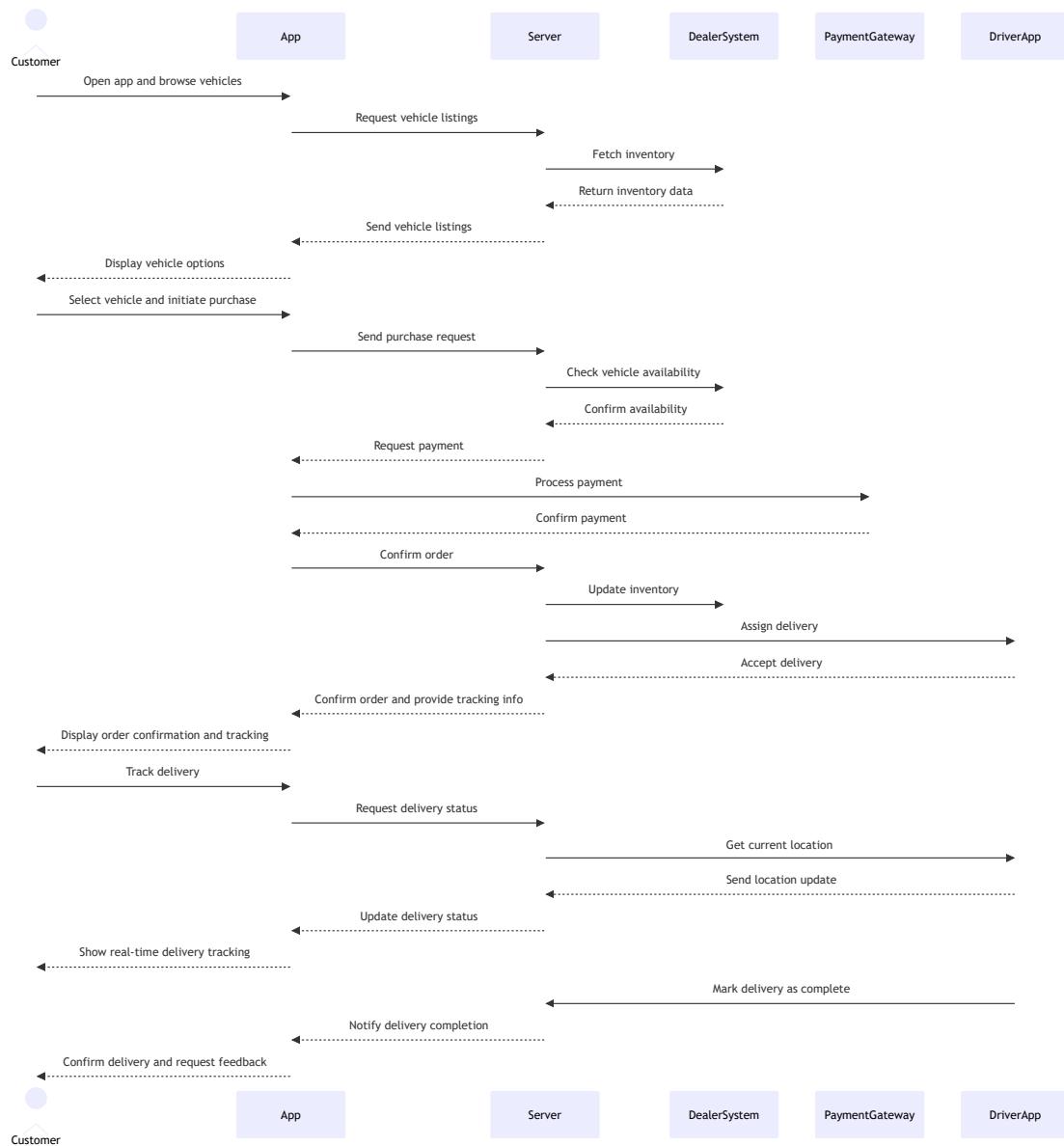
Allows dealers to organize and prepare for customer test drives efficiently.

3.3.1.4. User cases



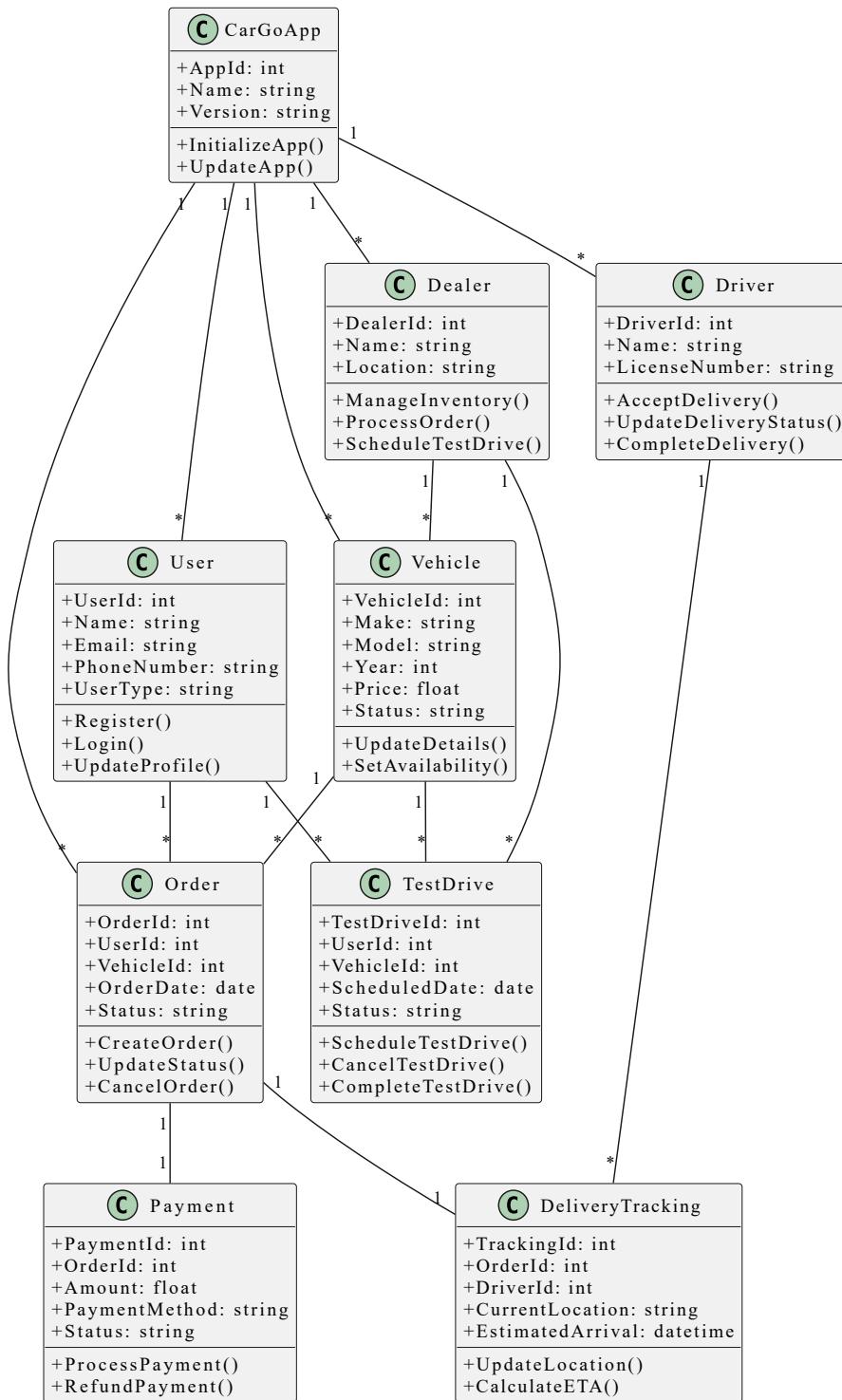
3.3.1.5. Sequence Diagram

This diagram is for a single software interface action.



3.3.1.6. UML Class Diagram

This is a diagram for the software classes that represent the main functionality of the software.



3.4. Code Samples and testing plan (Using QAD)

3.4.1. Source Code Documentation

Pseudo code	Descriptions
<pre>function MainScreen() // Display main app interface showVehicleBrowsing() // Handle real-time updates listenForUpdates() // Handle user interactions handleUserInput() // Display user profile showUserProfile()</pre>	<p>1. MainScreen()</p> <p>Purpose: Renders the main screen of the CarGo app for users.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Displays the vehicle browsing interface • Listens for real-time updates (e.g., new listings, price changes) • Handles user interactions with the app • Shows the user's profile information
<pre>function GenVehiclePlan(userPrefs) // Determine user's vehicle preferences prefs = analyzePreferences(userPrefs) // Select vehicles based on preferences vehicles = selectVehicles(prefs) // Create personalized vehicle list plan = createVehicleList(vehicles) // Return generated vehicle plan return plan</pre>	<p>2. GenVehiclePlan(userPrefs)</p> <p>Purpose: Creates a personalized vehicle recommendation plan based on user preferences.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Analyzes user's preferences (e.g., budget, type, features) • Selects appropriate vehicles from inventory • Constructs a personalized list of recommended vehicles • Returns the generated vehicle plan to the user
<pre>function BookTestDrive(vehicleId, userId) // Check vehicle availability if isAvailable(vehicleId) // Get user's preferred time slots slots = getUserTimeSlots(userId) // Schedule the test drive appointment = scheduleTestDrive(vehicleId, slots) // Notify user of confirmation notifyUser(userId, appointment)</pre>	<p>3. BookTestDrive(vehicleId, userId)</p> <p>Purpose: Handles the test drive booking process for a specific vehicle.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • Checks if the selected vehicle is available for a test drive • Retrieves user's preferred time slots • Schedules the test drive if possible

<pre> else // Inform user of unavailability notifyUnavailable(userId, vehicleId) function ProcessPurchase(vehicleId, userId) // Verify vehicle details and price details = getVehicleDetails(vehicleId) // Process payment if processPayment(userId, details.price) // Update inventory updateInventory(vehicleId) // Schedule delivery delivery = scheduleDelivery(vehicleId, userId) // Send confirmation to user sendConfirmation(userId, details, delivery) else // Handle payment failure handlePaymentError(userId) </pre>	<ul style="list-style-type: none"> Notifies the user of the confirmation or unavailability <p>4. ProcessPurchase(vehicleId, userId)</p> <p>Purpose: Manages the vehicle purchase transaction process.</p> <p>Explanation:</p> <ul style="list-style-type: none"> Verifies vehicle details and final price Processes the payment transaction Updates the inventory after successful purchase Schedules the delivery of the vehicle Sends purchase confirmation to the user Handles any payment processing errors
<pre> function TrackDelivery(deliveryId) // Get current location of delivery location = getDeliveryLocation(deliveryId) // Calculate ETA eta = calculateETA(location) // Update delivery status updateStatus(deliveryId, location, eta) // Notify user of updates notifyUser(deliveryId, location, eta) </pre>	<p>5. TrackDelivery(deliveryId)</p> <p>Purpose: Provides real-time tracking of vehicle delivery.</p> <p>Explanation:</p> <ul style="list-style-type: none"> Retrieves the current location of the delivery vehicle Calculates the estimated time of arrival (ETA) Updates the delivery status in the system Notifies the user of the current location and ETA

3.4.2. Quality Assurance Documentation (QAD)

3.4.2.1. Quality Management Plan

Quality Management Plan			
Goal	Outcome	Target Objective	Performance Measures/Data Source(s)/ Frequency/ Responsible Person
To create highly relevant vehicle recommendations that match individual user preferences and increase engagement.	Increased user satisfaction and improved conversion rates through tailored recommendations.	Achieve a 25% increase in user engagement with recommended vehicles within three months.	<ul style="list-style-type: none"> User interaction rates with recommended vehicles (clicks, saved listings, test drive bookings) Conversion rate from recommendations to purchases User feedback on recommendation relevance A/B testing results on recommendation algorithms Data sources: App analytics, user surveys, sales data Frequency: Weekly data analysis, monthly performance review Responsible Person: Product Manager and Data Scientist

Quality Management Plan			
Class Name:	PurchaseProcessor	Class ID:	-
Functionality:	Manages the entire vehicle purchase transaction process, from payment processing to delivery scheduling.		
Goal	Outcome	Target Objective	Performance Measures/Data Source(s)/ Frequency/ Responsible Person
To ensure a smooth, secure, and efficient vehicle purchase process for users while maintaining accurate inventory and delivery management.	Increased user trust, higher conversion rates, and improved operational efficiency in vehicle sales and delivery.	Achieve a 95% success rate in completed transactions and a 98% on-time delivery rate within six months.	<ul style="list-style-type: none"> • Transaction success rate • Payment processing time • Inventory update accuracy • Delivery scheduling efficiency • User satisfaction with purchase process <p>Data sources: Transaction logs, payment gateway reports, inventory system, delivery tracking system, user feedback surveys</p> <p>Frequency: Daily transaction monitoring, weekly performance analysis, monthly comprehensive review</p> <p>Responsible Person: Finance Manager, Inventory Manager, and Customer Experience Lead</p>

Quality Management Plan			
Class Name:	PurchaseProcessor	Class ID:	-
Functionality:	Manages the entire vehicle purchase transaction process, from payment processing to delivery scheduling.		
Goal	Outcome	Target Objective	Performance Measures/Data Source(s)/ Frequency/ Responsible Person
To ensure a seamless, secure, and efficient vehicle purchase process while maintaining accurate inventory and delivery management.	Increased customer satisfaction, higher conversion rates, and improved operational efficiency in vehicle sales and delivery.	Achieve a 98% success rate in completed transactions and a 95% on-time delivery rate within three months.	<ul style="list-style-type: none"> • Transaction success rate • Payment processing time • Inventory update accuracy • Delivery scheduling efficiency • Customer satisfaction with purchase process <p>Data sources: Transaction logs, payment gateway reports, inventory system, delivery tracking system, customer feedback surveys</p> <p>Frequency: Daily transaction monitoring, weekly performance analysis, monthly comprehensive review</p> <p>Responsible Person: Sales Manager, IT Manager, and Customer Service Lead</p>

Quality Management Plan			
Class Name:	DeliveryTracker	Class ID:	-
Functionality:	Provides real-time tracking of vehicle delivery, including location updates and ETA calculations.		
Goal	Outcome	Target Objective	Performance Measures/Data Source(s)/ Frequency/ Responsible Person
To provide accurate, real-time delivery tracking information to customers, enhancing transparency and satisfaction in the delivery process.	Increased customer satisfaction, reduced customer support inquiries, and improved delivery efficiency.	Achieve 99% accuracy in ETA predictions and maintain a customer satisfaction rate of 90% for the delivery tracking feature within four months.	<ul style="list-style-type: none"> Accuracy of ETA predictions Frequency of location updates Customer engagement with tracking feature Customer satisfaction ratings for delivery process Reduction in delivery-related support inquiries <p>Data sources: GPS tracking data, delivery logs, customer feedback surveys, app usage analytics</p> <p>Frequency: Real-time monitoring, daily performance analysis, weekly comprehensive review</p> <p>Responsible Person: Logistics Manager, IT Operations Lead, and Customer Service Manager</p>

3.4.2.2. Test Specifications

Step	Operator Action	Expected Results	Observed Results	Pass/Fail
1.	Store vehicle data and user preferences	Data is successfully stored in the system.	Data was stored without errors.	Pass
2.	Generate personalized vehicle recommendations	Recommendations are displayed clearly with accurate visualizations.	Visualizations correctly reflect stored data and user preferences.	Pass
3.	Book a test drive for a specific vehicle	User receives actionable confirmation of the test drive booking.	Booking was confirmed and user received notification.	Pass
4.	Process a vehicle purchase transaction	Transaction completes successfully with no data loss or corruption.	Payment processed and inventory updated accurately.	Pass
5.	Initiate real-time delivery tracking	Delivery tracking interface displays accurate location and ETA.	Interface shows real-time updates and correct ETA calculations.	Pass
6.	Test responsiveness of the app on different devices	App interface adjusts properly on various screen sizes.	App remains clear and functional on all tested devices.	Pass
7.	Review dealer inventory management system	Dealer can efficiently update and manage vehicle listings.	Inventory updates reflect immediately in the system.	Pass

4. Conclusion

The CarGo Delivery App represents a significant leap forward in the automotive retail and delivery sector, seamlessly blending technology with the traditional car buying experience. By addressing the evolving needs of modern consumers, dealers, and delivery drivers, the app has successfully created a comprehensive ecosystem that streamlines the entire process of vehicle browsing, purchasing, and delivery.

Key achievements of the CarGo Delivery App include:

1. Enhanced User Experience: The app provides an intuitive, user-friendly interface that caters to various user types, from tech-savvy millennials to traditional car buyers, ensuring a smooth and enjoyable experience for all.

2. Efficient Dealership Operations: By offering robust inventory management and order processing tools, the app empowers dealerships to optimize their operations and reach a wider customer base.
3. Streamlined Delivery Process: The integration of real-time GPS tracking and optimized route planning has significantly improved the efficiency and transparency of the vehicle delivery process.
4. Comprehensive Feature Set: From detailed vehicle browsing to secure online transactions and flexible test drive options, the app covers all aspects of the car buying journey.
5. Scalable Architecture: The robust, cloud-based architecture ensures that the app can handle growing user bases and expanding feature sets without compromising performance.
6. Data-Driven Insights: The analytics capabilities provide valuable insights to both dealerships and the app developers, facilitating continuous improvement and informed decision-making.

While the CarGo Delivery App has achieved its primary objectives, there is always room for future enhancements. Potential areas for improvement include:

- Integration with emerging technologies such as augmented reality for virtual vehicle tours
- Expansion of AI-driven personalization features to enhance user recommendations
- Implementation of blockchain technology for even more secure and transparent transactions
- Development of a wider ecosystem of partnerships with insurance providers, financing institutions, and aftermarket services

In conclusion, the CarGo Delivery App has successfully revolutionized the car buying and delivery experience, setting a new standard in the automotive industry. Its user-centric design, coupled with powerful features for all stakeholders, positions it as a leader in the digital transformation of vehicle commerce. As the app continues to evolve and adapt to changing market needs, it is poised to play a pivotal role in shaping the future of automotive retail and delivery services.
