

System Design for Sayyara

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1 Revision History

Table 1: Revision History

Date	Developer(s)	Change
December 28, 2022	Arkin Modi	Revision History & Mark Not Applicable Sections
January 7, 2023	Joy Xiao	Introduction & Purpose
January 11, 2023	Leon So	Undesired Event Handling
January 12, 2023	Leon So	Normal Behaviour & Introduction
January 16, 2023	Joy Xiao	Component Diagram
January 17, 2023	Arkin Modi	Create Timeline
January 17, 2023	Arkin Modi	Add Work Order Mockups
January 17, 2023	Joy Xiao	Add Shop Appointments, Services, Customer Landing Page Mockups
January 17, 2023	Leon So	Add Login & Sign Up, Shop Owner/Employee Landing Page, Shop Profile, Employee Management Mockups
January 17, 2023	Timothy Choy	Add Customer Appointments, Quotes, Shop Lookup Mockups

2 Reference Material

This section records information for easy reference.

2.1 Abbreviations and Acronyms

symbol	description
Sayyara	The name of the program being built
MIS	Module Interface Specifications
MG	Module Guide

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3 Introduction

The following document details the System Design for project Sayyara. Sayyara is a progressive web application (PWA) which will act as a single platform for independent auto repair shops and vehicle owners. This platform will allow independent auto repair shops and vehicle owners to interact in a more efficient and effective manner.

Complementary documents include the Module Interface Specifications and Module Guide. The full documentation and implementation can be found at <https://github.com/arkinmodi/project-sayyara/>.

4 Purpose

The purpose of this document is to display the component decomposition of the system and provide the user interface designs of the software being built. The implementation of the software will be based off of the designs within this document. The MIS <https://github.com/arkinmodi/project-sayyara/blob/main/docs/Design/SoftDetailedDes/MIS.pdf> and MG <https://github.com/arkinmodi/project-sayyara/blob/main/docs/Design/SoftArchitecture/MG.pdf> are also created to give details to the software architecture and detailed component breakdowns for the project.

5 Scope

[Include a figure that show the System Context (showing the boundary between your system and the environment around it.) —SS]

6 Project Overview

6.1 Normal Behaviour

Sayyara is an event-driven application which handles inputs from the intended users including: vehicle owners, and independent auto repair shop owners and employees. The application will accept various inputs through a variety of input forms and controls. Under normal behaviour where valid inputs are entered and valid events are triggered, the application will: update the appropriate local and global application states, trigger the corresponding side-effects, and/or update the database accordingly.

Vehicle owners can search for auto repair shops and services; request quotes for service; book, view, and manage service appointments and work orders. On the application, auto repair shop owners will be able to manage a list of employees; manage a list of service types and corresponding service appointment availabilities; manage store information such as location, hours of operation, and contact information. Auto repair shop owners and employees will be able to view and manage quotes, service appointments, and work orders.

6.2 Undesired Event Handling

Undesired events will be handled both client-side and server-side.

On the client-side, if an unexpected event arises or the application enters a bad state, the application will reset to a safe state. For example, if a user attempts to access a route that they are not authorized to access, they will be either redirected to an appropriate route, prompted to login, or an error page will be displayed with instructions to return to the home page. Input forms will also include input validation to ensure only properly formed data is handled. If the user attempts to input invalid data, the form field will reset and form submission will be blocked. The user will be prompted to enter a valid input value in the form field. Similarly, various user actions and inputs that may pose cause that the application to enter an undesirable state will be validated before updating the application state.

On the server-side, each API will return a response with the appropriate error status code and message. Subsequently, the client will have logic to gracefully handle unsuccessful responses and status codes, preventing the system from entering an undesirable state. Inputs will also be validated on the server-side by parsing the input data using defined schemas. This will ensure data integrity and prevents the undesirable data from entering the workflows or database.

6.3 Component Diagram

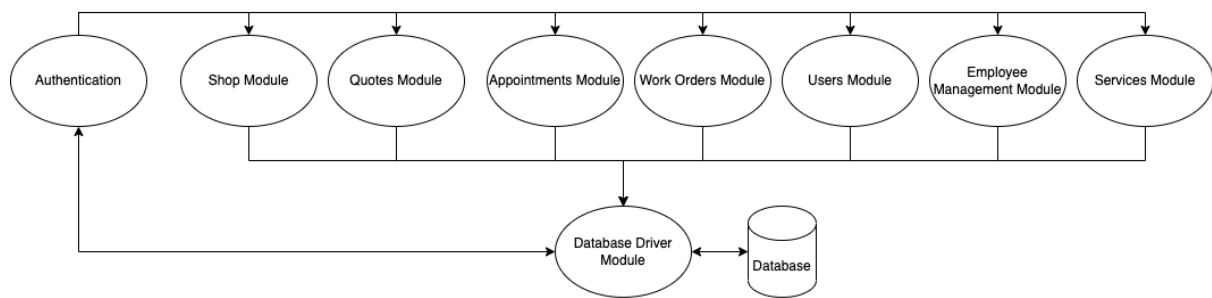


Figure 1: Component Diagram

6.4 Connection Between Requirements and Design

[The intention of this section is to document decisions that are made “between” the requirements and the design. To satisfy some requirements, design decisions need to be made. Rather than make these decisions implicit, they are explicitly recorded here. For instance, if a program has security requirements, a specific design decision may be made to satisfy those requirements with a password. —SS]

7 System Variables

7.1 Monitored Variables

N/A

7.2 Controlled Variables

N/A

7.3 Constants Variables

N/A

8 User Interfaces

8.1 Home Page

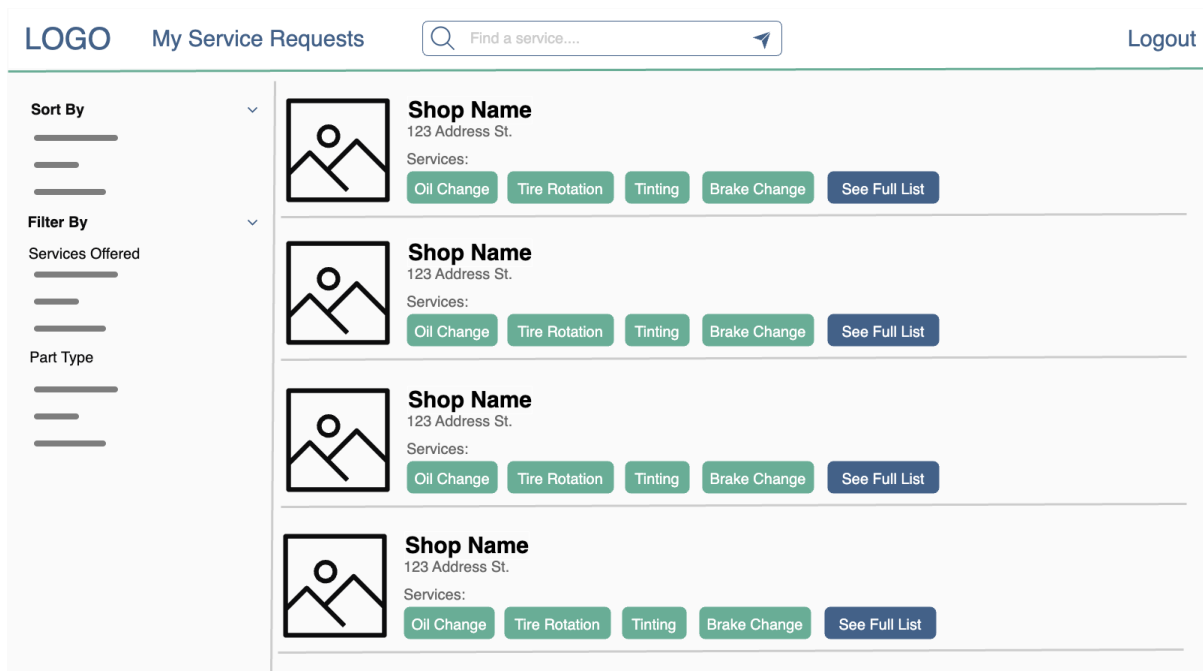


Figure 2: Home Page — Logged In (Desktop)

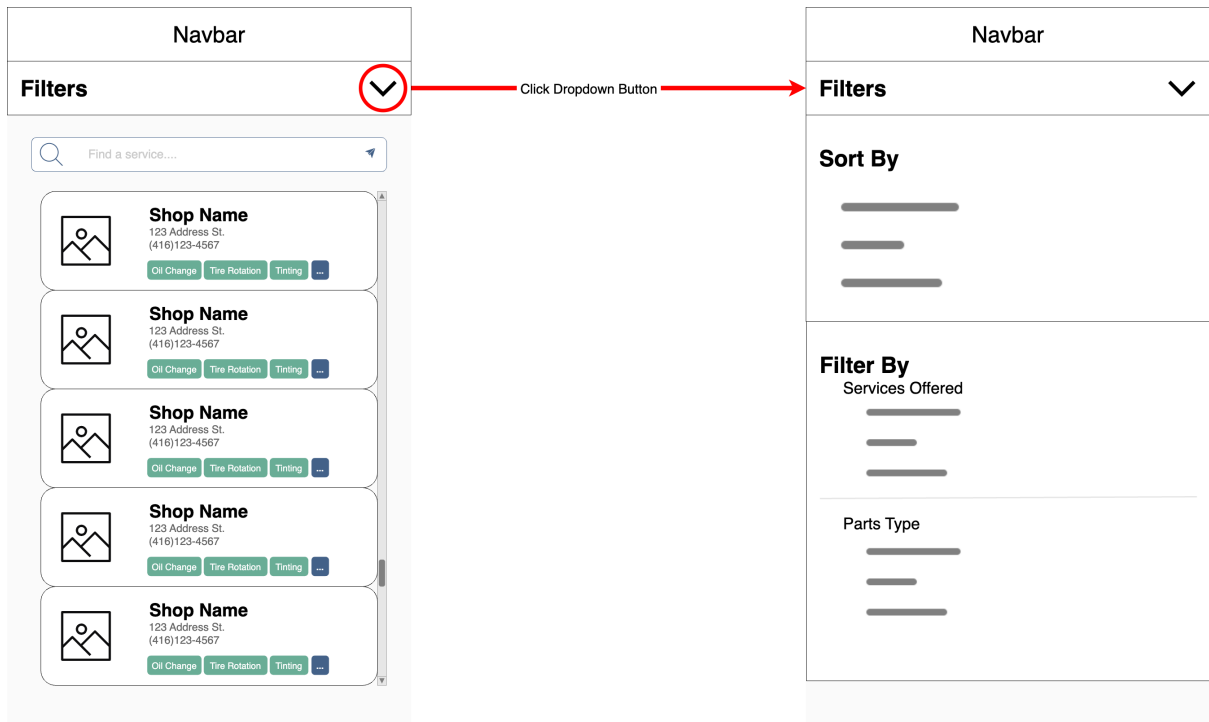


Figure 3: Home Page — Logged In (Mobile)

8.2 Manage Shop Employees

LOGO	Service Requests	Manage Shop	Profile	Logout
Services	Employees			
<div> <input type="text" value="Search employees"/> </div>				
ID	Name ↑↓	Email	Phone Number	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	
<id>	<employee name>	<employee email>	<employee phone #>	

Figure 4: Manage Shop — Employees (Desktop)



Employees

[illegible]

Figure 5: Manage Shop — Employees (Mobile)

8.3 Manage Shop Details

LOGO

Service Requests

Manage Shop

Profile

Logout

Services

Employees

Shop ID: <shop id>

Basic Services

Add Basic Service

Search Service

Service Type	Description	Part Type	Part Condition	Duration (H)	Estimated Cost		

Custom Services

Add Custom Service

Search Service

Service Type	Description	Part Type	Part Condition		

Figure 6: Manage Shop — Details (Desktop)

Navbar

Services

Employees

Shop ID: <shop id>

Basic Services

Add Basic Service

Search services

Service Type	Description		

Custom Services

Add Custom Service

Search services

Service Type	Description		

Figure 7: Manage Shop — Details (Mobile)

8.4 Shop Profile

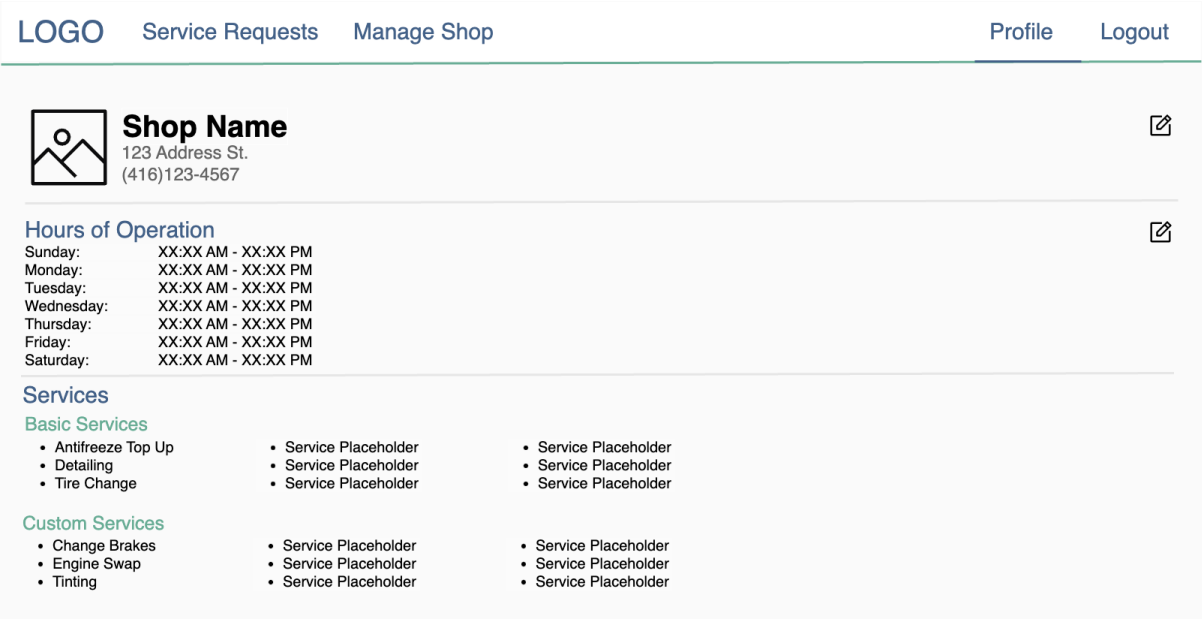


Figure 8: Shop Profile — Shop Owner (Desktop)

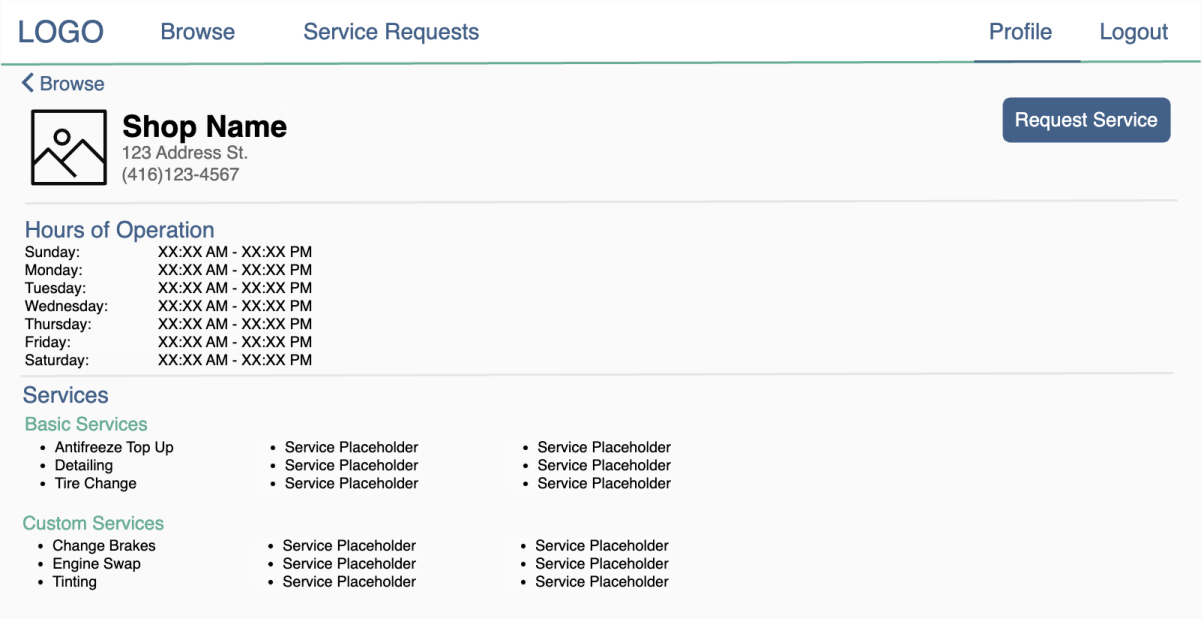



Figure 9: Shop Profile — Vehicle Owner (Desktop)

Navbar

[< Browse](#)



Shop Name
 123 Address St.
 (416)123-4567

Hours of Operation

Sunday:	XX:XX AM - XX:XX PM
Monday:	XX:XX AM - XX:XX PM
Tuesday:	XX:XX AM - XX:XX PM
Wednesday:	XX:XX AM - XX:XX PM
Thursday:	XX:XX AM - XX:XX PM
Friday:	XX:XX AM - XX:XX PM
Saturday:	XX:XX AM - XX:XX PM

Services

Basic Services

• Antifreeze Top Up	• Service Placeholder
• Detailing	• Service Placeholder
• Tire Change	• Service Placeholder
• Service Placeholder	• Service Placeholder
• Service Placeholder	• Service Placeholder

Custom Services

• Change Brakes	• Service Placeholder
• Engine Swap	• Service Placeholder
• Tinting	• Service Placeholder
• Service Placeholder	• Service Placeholder
• Service Placeholder	• Service Placeholder

Request Service

Figure 10: Shop Profile (Mobile)

8.5 Add Service to Shop

LOGO

Service Requests

Manage Shop

Profile

Logout

Services

Employees

Shop ID: <shop id>

Basic Services

Add Basic Service

Service Type

Description

Part Condition

Now

Part Type

Aftermarket

Save Custom Service

Search Service

Service Type	Description	Part Type	Part Condition

LOGO

Service Requests

Manage Shop

Profile

Logout

Services

Employees

Shop ID: <shop id>

Basic Services

Add Basic Service

Service Type

Description

Part Condition

Now

Part Type

Aftermarket

Duration (in hours)

Estimated Cost

Save Basic Service

Search Service

Service Type	Description	Part Type	Part Condition

Figure 11: Add Service to Shop (Desktop)

Navbar

Shop Settings
Employees

Shop ID: <shop id>
Basic Services
Add Basic Service

Se

Add Basic Service

Service Type

Description

Part Condition
New

Part Type
Aftermarket

Duration (in hours)

Estimated Cost

Save Basic Service

Navbar

Shop Settings
Employees

Shop ID: <shop id>
Basic Services
Add Basic Service

Se

Add Custom Service

Service Type

Description

Part Condition
New

Part Type
Aftermarket

Save Custom Service

Custom Services
Add Custom Service

Search services

Service Type	Description	

Figure 12: Add Service to Shop (Mobile)

8.6 Shop Owner/Employee Registration

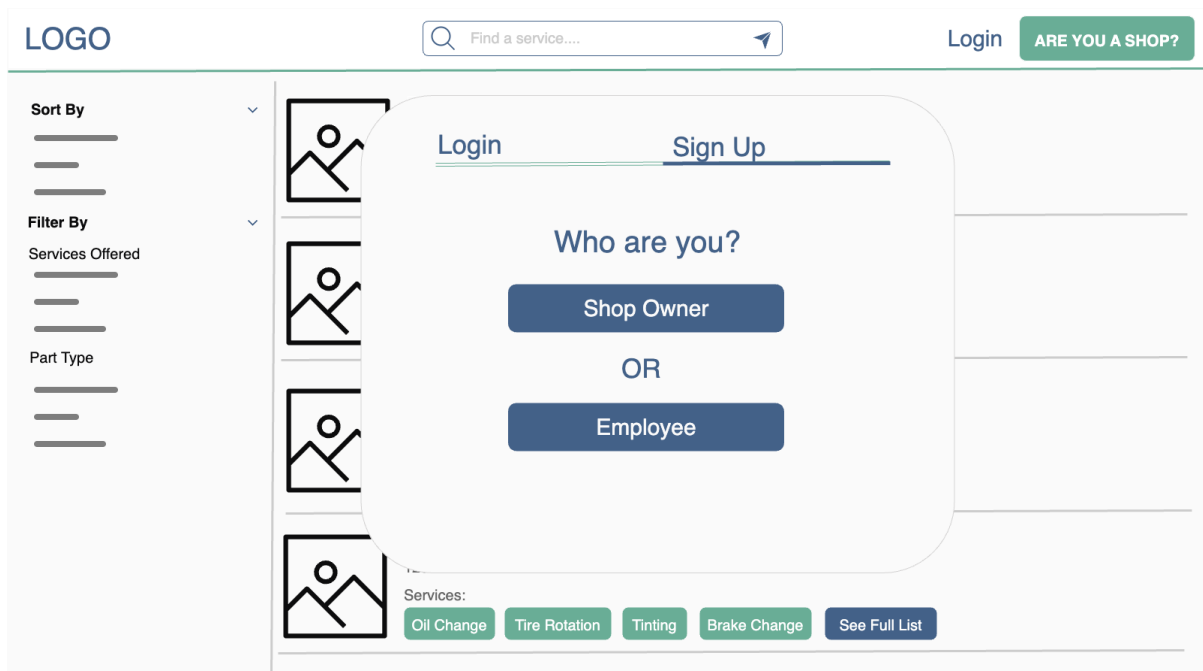


Figure 13: Shop Owner/Employee Registration — Part 1 (Desktop)

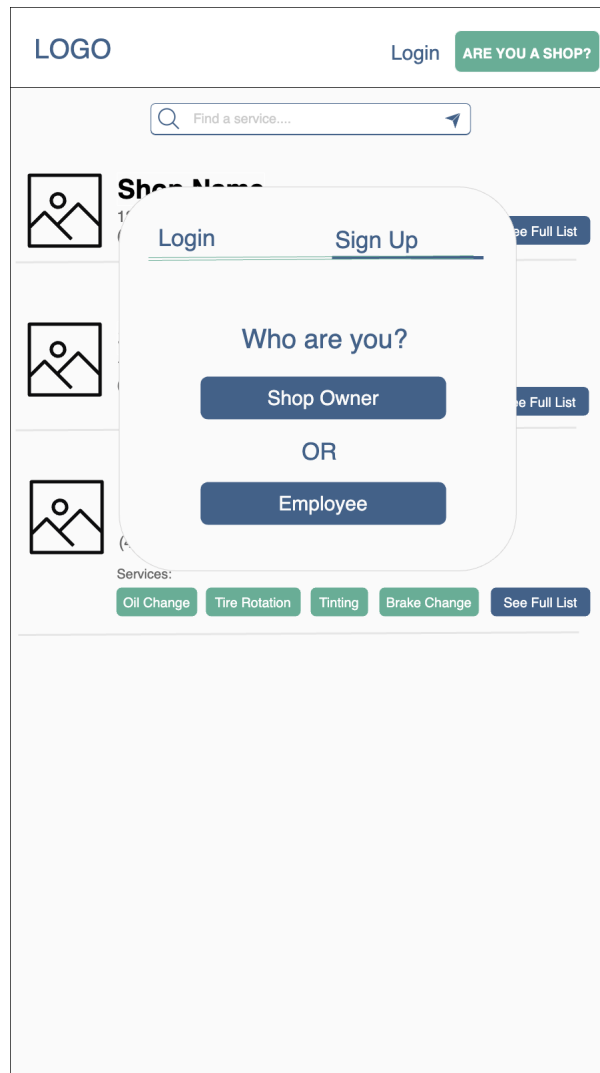


Figure 14: Shop Owner/Employee Registration — Part 1 (Mobile)

LOGO

Q

Find a service....

➤

Login

ARE YOU A SHOP?

Sort By

Filter By

Services Offered

Part Type

Login

Sign Up

First Name

John

Last Name

Doe

Email

example@email.com

Phone

(416) 123 - 4567

Password

Back

Next

Services:

Oil Change

Tire Rotation

Tinting

Brake Change

See Full List

Figure 15: Shop Owner/Employee Registration — Part 2 (Desktop)

LOGO

Find a service...

Login

ARE YOU A SHOP?

Sort By

Filter By

Services Offered

Part Type

Login

Sign Up

Shop Name

ABC Auto Repair

Shop Address

123 Address St.

City

Toronto

Postal Code

A1B 2C3

Province

Shop Phone Number

(416) 123 - 4567

Back

Sign Up

Services:

Oil Change

Tire Rotation

Tinting

Brake Change

See Full List


Figure 17: Shop Owner Registration — Part 3 (Desktop)

LOGO

Login


ARE YOU A SHOP?

Find a service.....




Shop Name

123



Shop Address

123 Address St.



Shop Phone Number

(416) 123 - 4567

Login

Sign Up

Shop Name

ABC Auto Repair

Shop Address

123 Address St.

City

Toronto

Postal Code

A1B 2C3

Province

Shop Phone Number

(416) 123 - 4567

Back

Sign Up

See Full List

See Full List

See Full List

Figure 18: Shop Owner Registration — Part 3 (Mobile)

LOGO

Find a service....

Login

ARE YOU A SHOP?

Sort By

Filter By

Services Offered

Part Type

Login

Sign Up

Shop ID

ABCDEFG12345

Back

Sign Up

Services:

Oil Change

Tire Rotation

Tinting

Brake Change

See Full List

Figure 19: Employee Registration — Part 3 (Desktop)

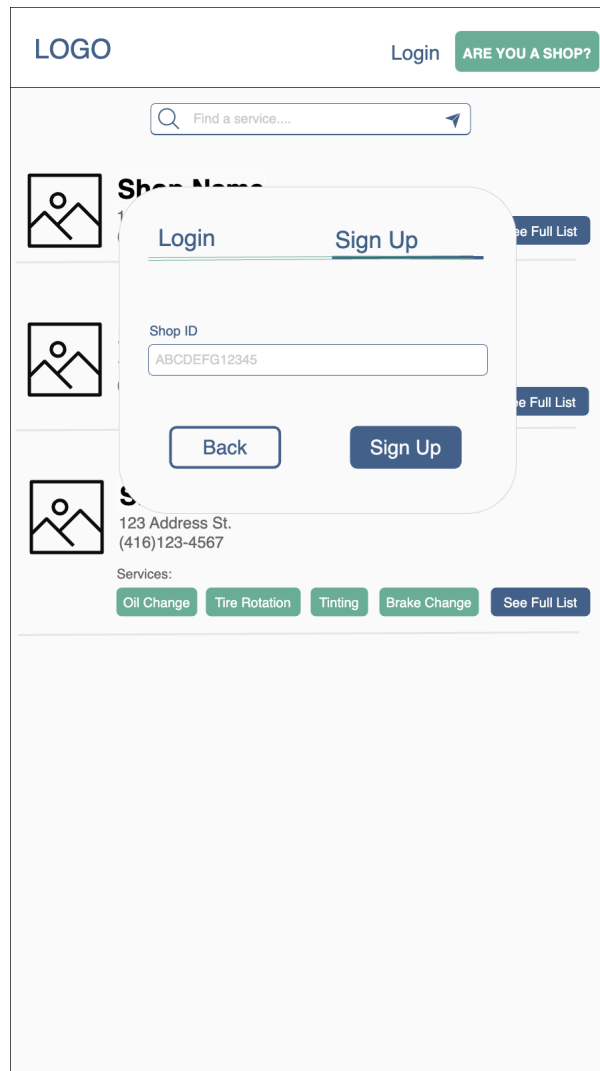


Figure 20: Employee Registration — Part 3 (Mobile)

8.7 Vehicle Owner Registration

LOGO

Find a service....

Login ARE YOU A SHOP?

Sort By

Filter By

Services Offered

Part Type

Login Sign Up

First Name
John

Last Name
Doe

Email
example@email.com

Phone
(416) 123 - 4567

Password

Next

Services:

Oil Change Tire Rotation Tinting Brake Change See Full List

Figure 21: Vehicle Owner Registration — Part 1 (Desktop)

The image shows a mobile application interface for vehicle owner registration. At the top, there is a header bar with a 'LOGO' on the left, a 'Login' link in the center, and a green button labeled 'ARE YOU A SHOP?' on the right. Below the header is a search bar with the placeholder text 'Find a service.....' and a magnifying glass icon. The main content area features a vertical list of three items, each with a placeholder icon of a person and a mountain. A modal dialog box is overlaid on the screen, containing two tabs: 'Login' and 'Sign Up'. The 'Sign Up' tab is currently selected. The form fields within the modal are: 'First Name' (with the value 'John'), 'Last Name' (with the value 'Doe'), 'Email' (with the value 'example@email.com'), 'Phone' (with the value '(416) 123 - 4567'), and 'Password' (with masked characters '*****'). A blue 'Next' button is located at the bottom of the modal. To the right of the modal, parts of three buttons labeled 'See Full List' are visible.

Figure 22: Vehicle Owner Registration — Part 1 (Mobile)

LOGO

Find a service...

Login

ARE YOU A SHOP?

Sort By

Filter By

Services Offered

Part Type

Person icon

Person icon

Person icon

Person icon

Vehicle Make

Toyota

Vehicle Model

Corolla

Manufacture Year

2022

VIN

VIN

License Plate

#####

Back

Sign Up

Services:

Oil Change

Tire Rotation

Tinting

Brake Change

See Full List

Figure 23: Vehicle Owner Registration — Part 2 (Desktop)

8.8 Vehicle Owner/Shop Owner/Employee Login

LOGO

Find a service....

Login ARE YOU A SHOP?

Sort By

Filter By

Services Offered

Part Type

Login Sign Up

Email
example@email.com

Password

Login

Services:

Oil Change Tire Rotation Tinting Brake Change See Full List

Figure 25: Vehicle Owner/Shop Owner/Employee Login (Desktop)

LOGO

Login

ARE YOU A SHOP?

Find a service.....

Shop Name

Shop Name

123 Address St.
(416)123-4567

Services:

Oil Change

Tire Rotation

Tinting

Brake Change

See Full List

See Full List

See Full List

Login

Sign Up

Email

Password

Login

Figure 26: Vehicle Owner/Shop Owner/Employee Login (Mobile)

8.9 Vehicle Owner Dashboard

8.9.1 Service Requests

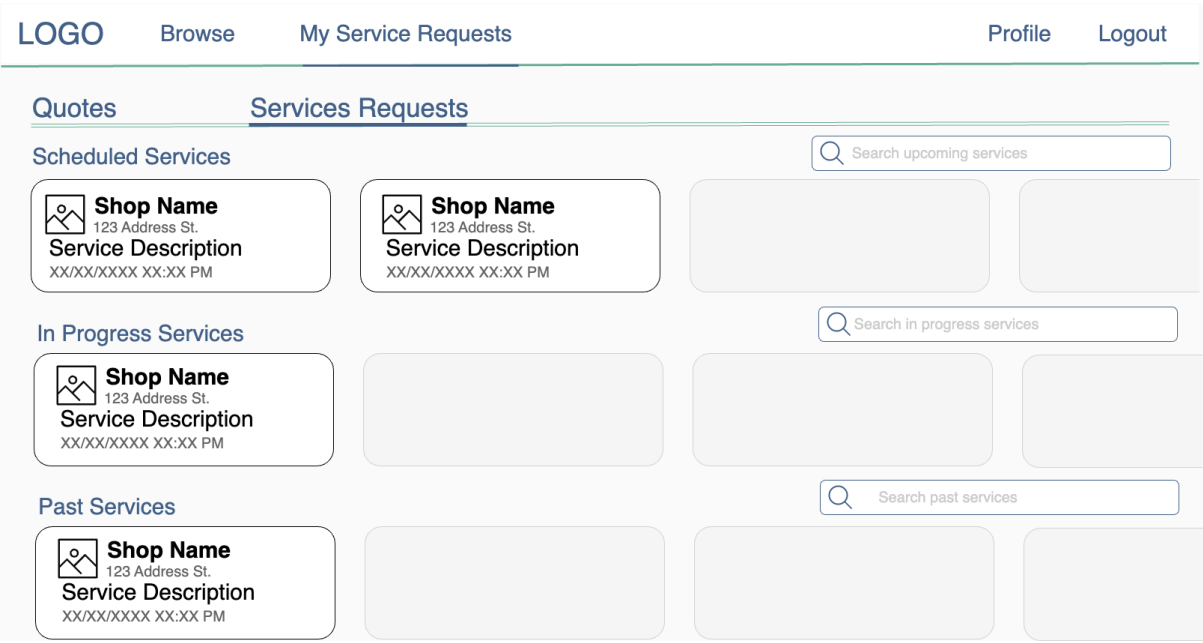


Figure 27: Vehicle Owner Dashboard — Service Requests (Desktop)

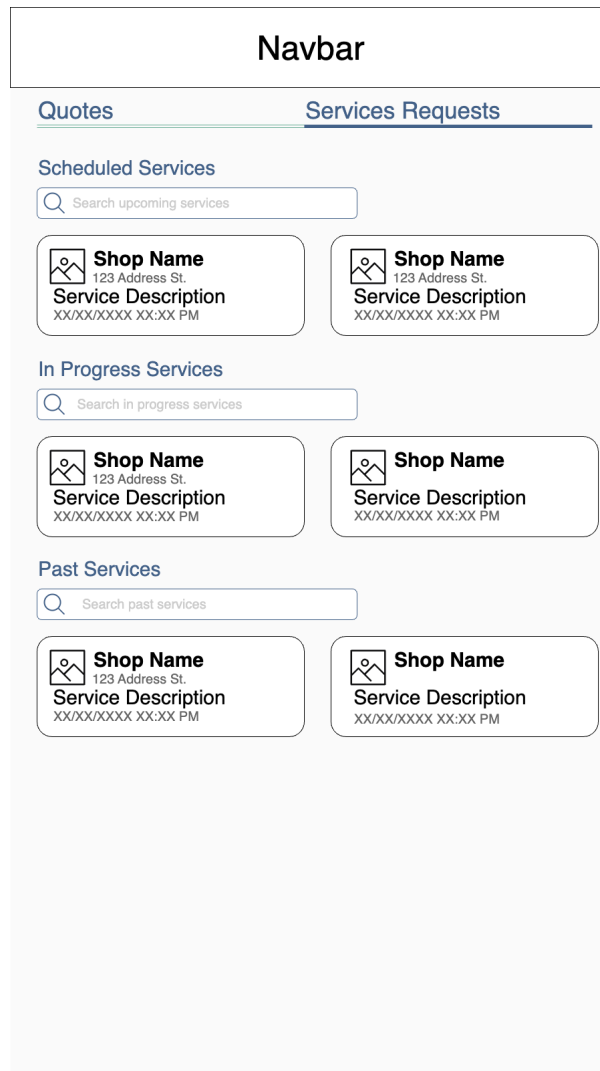


Figure 28: Vehicle Owner Dashboard — Service Requests (Mobile)

8.9.2 Quotes

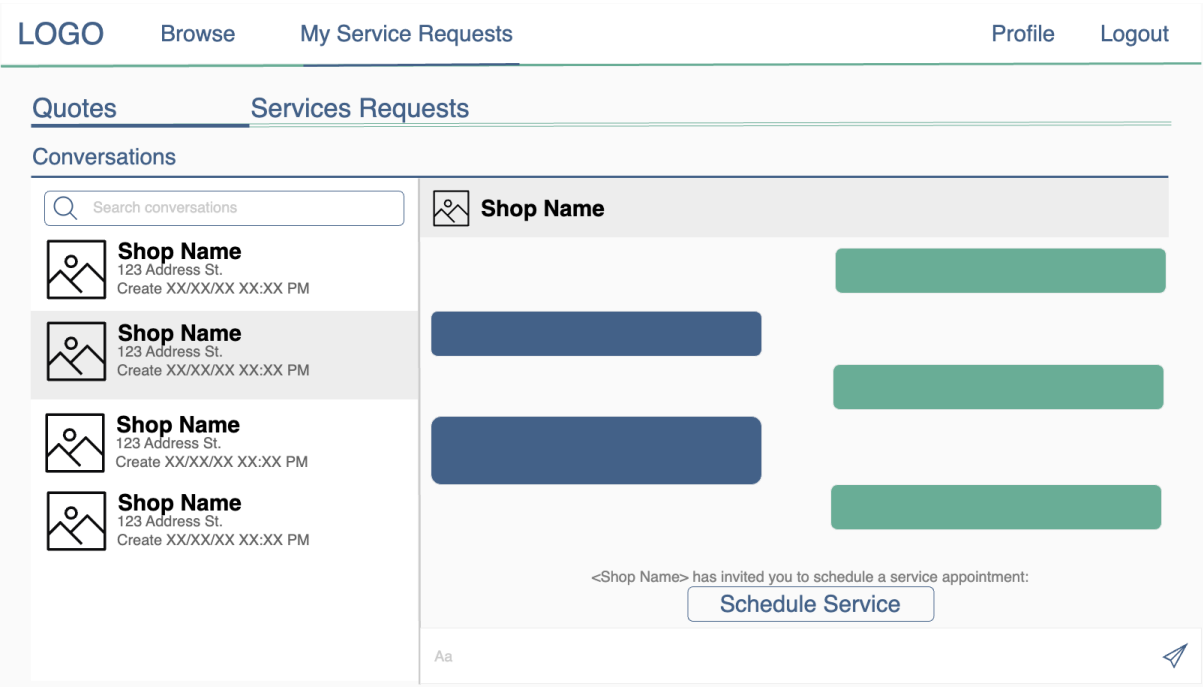


Figure 29: Vehicle Owner Dashboard — Quotes (Desktop)

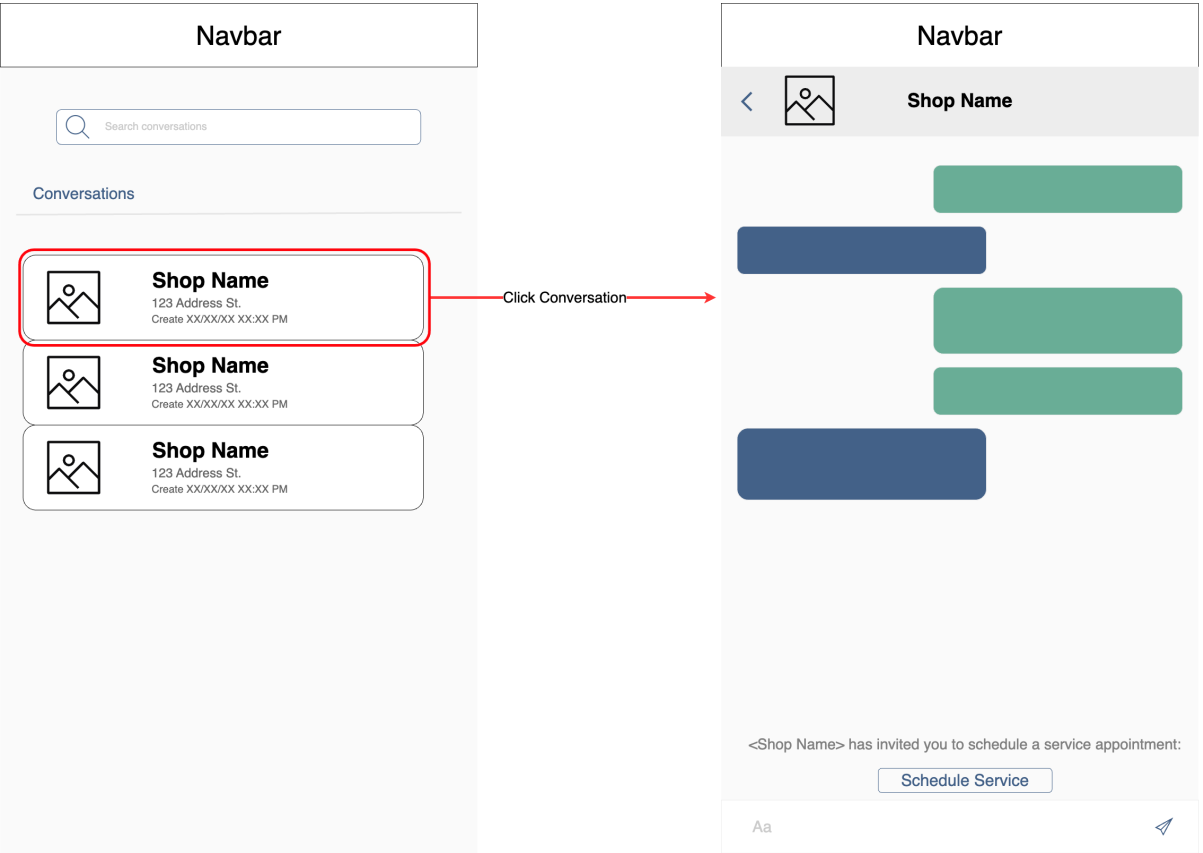


Figure 30: Vehicle Owner Dashboard — Quotes (Mobile)

8.10 Vehicle Owner Create Appointment

The image illustrates the user flow for creating an appointment, showing three sequential forms:

- Select a Service:** The user selects a service from a dropdown menu. The available services are: Oil Change, Oil Filter, Oil & Filter, Brakes, General Maintenance, and Other. A button at the bottom says "Schedule Service / Proceed to Quote".
- Create Appointment:** The user enters vehicle details (Year, Make, Model), selects a service, and chooses a date and time. The date is selected from a calendar. The time is selected from a list of available timeslots. A button at the bottom says "Schedule Service".
- Available Timeslots:** The user selects a time slot from a grid of available times. The available timeslots are: 9:00 am, 10:00 am, 11:00 am, 12:00 pm, 1:00 pm, 2:00 pm, 3:00 pm, and 4:00 pm. A button at the bottom says "Schedule Service".

Red boxes and arrows indicate the flow of the process, showing the user's path from selecting a service to choosing a date and time, and then back to the appointment creation form.

Figure 31: Vehicle Owner Create Appointment (Desktop)

8.11 Shop Owner/Employee Dashboard

8.11.1 Quotes Requests

[illegible]

Figure 32: Shop Owner/Employee Dashboard — Quotes Requests (Desktop)

LOGO

Service Requests

Manage Shop

Profile

Logout

Quotes

Services Requests

Conversations

Search conversations

Customer Name

Service Name

Create XX/XX/XX XX:XX PM

Customer Name

Service Name

Create XX/XX/XX XX:XX PM

Customer Name

Service Name

Create XX/XX/XX XX:XX PM

Customer Name

Service Name

Create XX/XX/XX XX:XX PM

Customer Name

Create Invitation

Vehicle Year

2015

Vehicle Make

Honda

Vehicle Model

Civic

Price Estimate

\$ Labour rate + Parts Cost

Duration

1 hour

30 minutes

1 hour

1.5 hours

2 hours

2.5 hours

3 hours

Description

Description of service/job

Invite to Schedule

Figure 33: Shop Owner/Employee Dashboard — Quotes Requests — Invitation (Desktop)

8.11.2 Service Requests — Requested

LOGO

Service Requests

Manage Shop

Profile

Logout

Quotes

Services Requests

Requested (#)

Scheduled (#)

In Progress (#)

Completed

Dec 30, 2022

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Reject

Accept

Estimate: \$XXX.XX

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Reject

Accept

Estimate: \$XXX.XX

Dec 31, 2022

Service Type

Customer Name:

View Quote

Reject

Accept

Figure 34: Shop Owner/Employee Dashboard — Service — Requested (Desktop)

LOGO

Quotes

Services Requests

Requested (#)

Scheduled (#)

In Progress (#)

Completed

Dec 30, 2022

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Reject

Accept

Estimate: \$XXX.XX

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Reject

Accept

Estimate: \$XXX.XX

Dec 31, 2022

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Reject

Accept

Estimate: \$XXX.XX

Figure 35: Shop Owner/Employee Dashboard — Service — Requested (Mobile)

8.11.3 Service Requests — Scheduled

LOGO [Service Requests](#) [Manage Shop](#) [Profile](#) [Logout](#)

[Quotes](#)

[Services Requests](#)

[Requested \(#\)](#)

[Scheduled \(#\)](#)

[In Progress \(#\)](#)

[Completed](#)

Dec 29, 2022

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Cancel

Estimate: \$XXX.XX

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Cancel

Estimate: \$XXX.XX

Dec 30, 2022

Service Type

Customer Name:

View Quote

Figure 36: Shop Owner/Employee Dashboard — Service — Scheduled (Desktop)

LOGO

Quotes

Services Requests

Requested (#)

Scheduled (#)

In Progress (#)

Completed

Dec 29, 2022

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Cancel

Estimate: \$XXX.XX

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Cancel

Estimate: \$XXX.XX

Dec 30, 2022

Service Type

Customer Name:

Start Time:

End Time:

Vehicle Make:

Vehicle Model:

Manufacture Year:

View Quote

Cancel

Estimate: \$XXX.XX

Figure 37: Shop Owner/Employee Dashboard — Service — Scheduled (Mobile)

8.11.4 Service Requests — In Progress

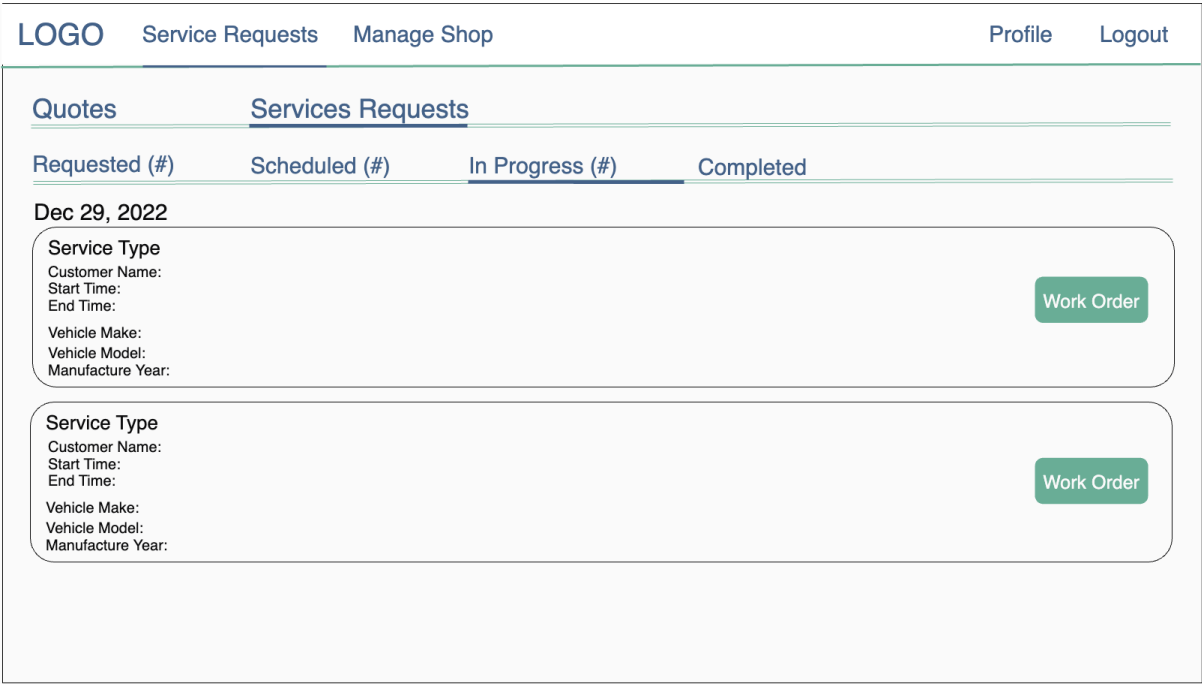


Figure 38: Shop Owner/Employee Dashboard — Service — In Progress (Desktop)

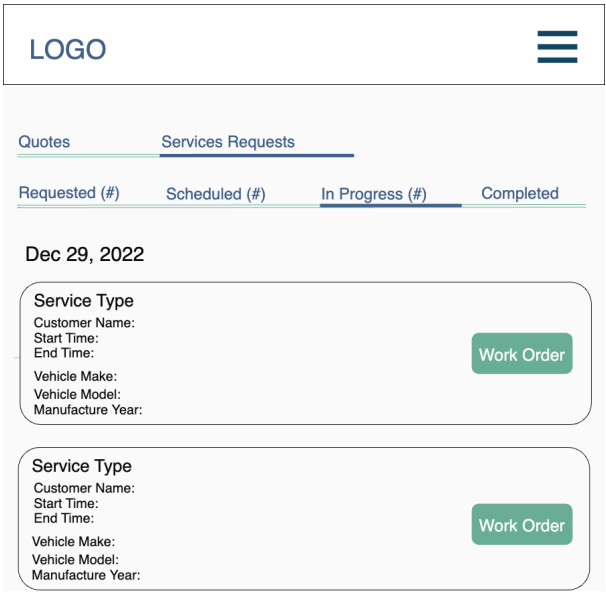


Figure 39: Shop Owner/Employee Dashboard — Service — In Progress (Mobile)

8.11.5 Service Requests — Work Orders

LOGO

Service RequestsManage Shop

ProfileLogout

Quotes

Services Requests

Requested (#)

Scheduled (#)

In Progress (#)

Completed

< Back

Tire Rotation

Last Updated: XX/XX/XX XX:XX PM

Status: In Progress

Assigned to: <Employee Name>

Customer: Todd Howard <todd@example.com>

Vehicle: 2017 Ford F150

Customer Email: todd@example.com

Vehicle VIN: 1FTFW1RG0HFA66295

Customer Phone Number: (905) 525-9140

Edit Metadata

B

/

U

<Work Order Details>
(Rich Text Editor)

Save

Last Saved: XXXXXXXX XXXXX PM

Figure 40: Shop Owner/Employee Dashboard — Service Requests — Work Orders (Desktop)

Back to "In Progress" Service Requests

Navbar

<

Tire Rotation

Last Updated: XX/XX/XX XX:XX PM
Assigned to: <Employee Name>
Customer: Todd Howard <todd@example.com>
Customer Email: todd@example.com
Customer Phone Number: (905) 525-9140
Vehicle: 2017 Ford F150
Vehicle VIN: 1FTFW1RG0HFA66295

B

/

U

<Work Order Details>
(Rich Text Editor)

Save

Last Saved: XX/XX/XX XX:XX PM

Figure 41: Shop Owner/Employee Dashboard — Service Requests — Work Orders (Mobile)

8.11.6 Service Requests — Completed

LOGO [Service Requests](#) [Manage Shop](#) [Profile](#) [Logout](#)

[Quotes](#) [Services Requests](#)

[Requested \(#\)](#) [Scheduled \(#\)](#) [In Progress \(#\)](#) [Completed](#)

Nov 29, 2022

Service Type
Customer Name:
Start Time:
End Time:
Vehicle Make:
Vehicle Model:
Manufacture Year:

Work Order

Service Type
Customer Name:
Start Time:
End Time:
Vehicle Make:
Vehicle Model:
Manufacture Year:

Work Order

Nov 30, 2022

Service Type
Customer Name:

Figure 42: Shop Owner/Employee Dashboard — Service — Completed (Desktop)

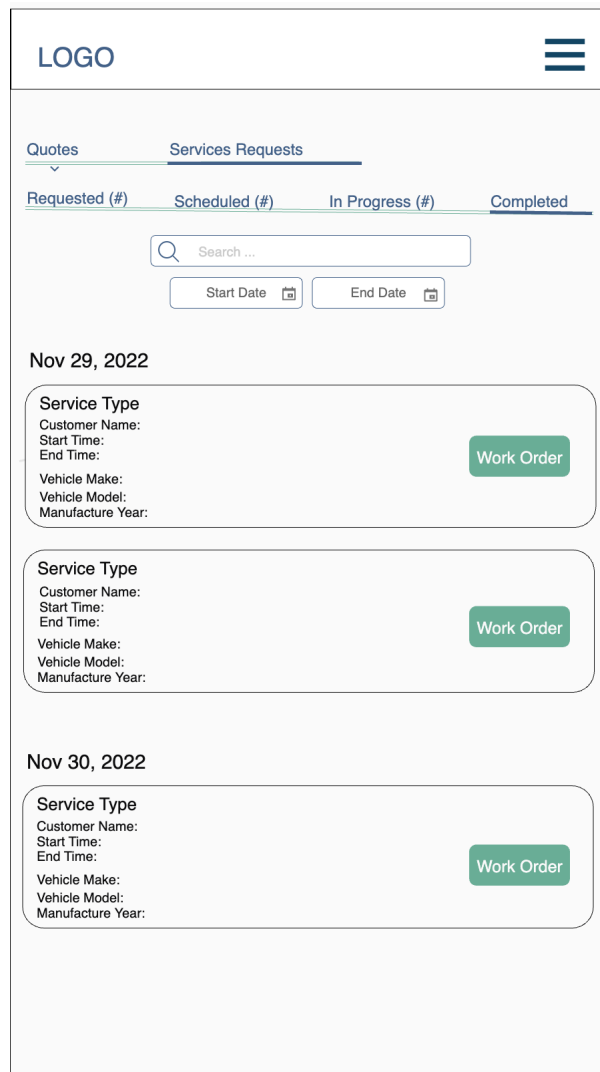


Figure 43: Shop Owner/Employee Dashboard — Service — Completed (Mobile)

9 Design of Hardware

N/A

10 Design of Electrical Components

N/A

11 Design of Communication Protocols

N/A

12 Timeline

12.1 Module Development

The development of the modules shall take place over the months of December 2022 and January 2023. Specific dates, and responsibilities are described in Table 2.

Table 2: Module Development Timeline

Module Name	Development Timeline	Developer(s)
Database Driver Module	Dec. 1, 2022 — Jan. 31, 2023	Arkin Modi, Joy Xiao, Leon So, Timothy Choy
Users Module	Dec. 1, 2022 — Dec. 15, 2022	Arkin Modi, Leon So
Employee Management Module	Dec. 15, 2022 — Dec. 22, 2022	Joy Xiao, Leon So
Shop Module	Dec. 15, 2022 — Dec. 22, 2022	Leon So, Timothy Choy
Quotes Module	Jan. 1, 2023 — Jan. 8, 2023	Arkin Modi, Timothy Choy
Services Module	Jan. 1, 2023 — Jan. 8, 2023	Arkin Modi, Joy Xiao
Appointments Module	Jan. 15, 2023 — Jan. 22, 2023	Arkin Modi, Joy Xiao, Timothy Choy
Work Orders Module	Jan. 15, 2023 — Jan. 24, 2023	Arkin Modi

12.2 Module Testing

The testing of the modules shall take place over the months of December 2022 and January 2023. The tests conducted shall primarily consist of manual testing and have the primary goal of certifying confidence for the Revision 0 Demonstration. This testing will not include everything described in the System Verification and Validation Plan. Generally, testing will take place for the week after development is scheduled to finish. Specific dates, and responsibilities are described in Table 3.

Table 3: Module Testing Timeline

Module Name	Testing Timeline	Developer(s)
Database Driver Module	Dec. 1, 2022 — Jan. 31, 2023	Arkin Modi, Joy Xiao, Leon So, Timothy Choy
Users Module	Dec. 15, 2022 — Dec. 22, 2022	Arkin Modi, Leon So
Employee Management Module	Dec. 22, 2022 — Dec. 29, 2022	Joy Xiao, Leon So
Shop Module	Dec. 22, 2022 — Dec. 29, 2022	Leon So, Timothy Choy
Quotes Module	Jan. 8, 2023 — Jan. 15, 2023	Arkin Modi, Timothy Choy
Services Module	Jan. 8, 2023 — Jan. 15, 2023	Arkin Modi, Joy Xiao
Appointments Module	Jan. 22, 2023 — Jan. 29, 2023	Arkin Modi, Joy Xiao, Timothy Choy
Work Orders Module	Jan. 24, 2023 — Jan. 31, 2023	Arkin Modi

13 Appendix

13.1 Interface

[Include additional information related to the appearance of, and interaction with, the user interface —SS]

13.2 Reflection

The information in this section will be used to evaluate the team members on the graduate attribute of Problem Analysis and Design. Please answer the following questions:

1. What are the limitations of your solution? Put another way, given unlimited resources, what could you do to make the project better? (LO_ProbSolutions)
2. Give a brief overview of other design solutions you considered. What are the benefits and tradeoffs of those other designs compared with the chosen design? From all the potential options, why did you select documented design? (LO_Explores)