

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	Explanation of program name
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

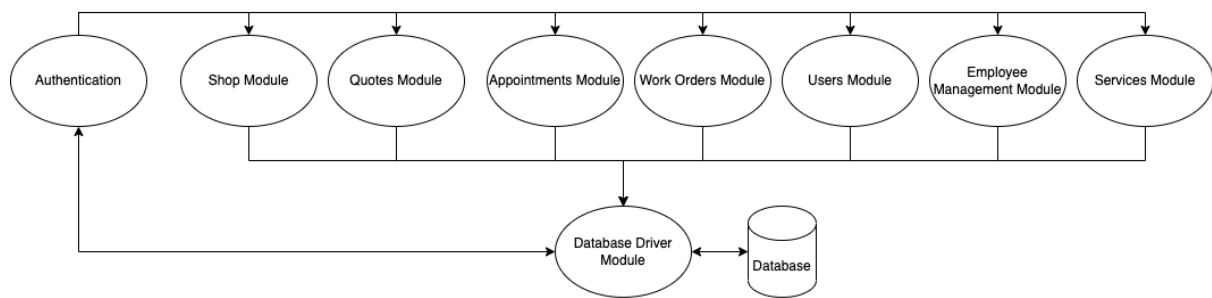


Figure 1: Component Diagram

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

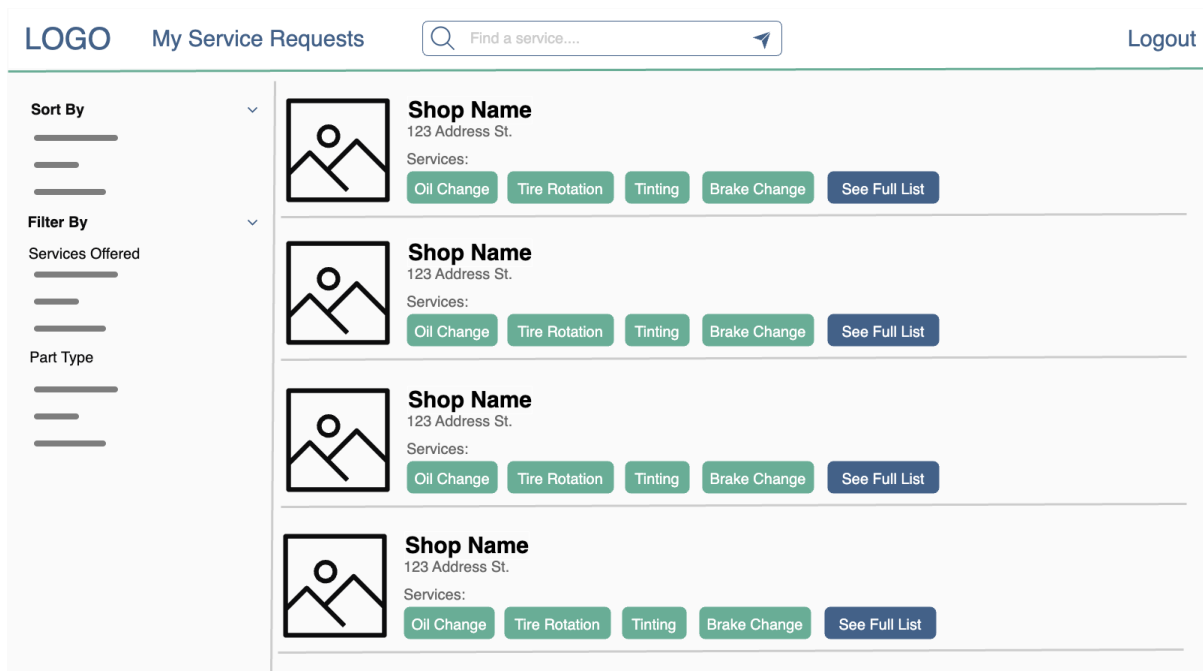


Figure 2: Home Page — Logged In (Desktop)

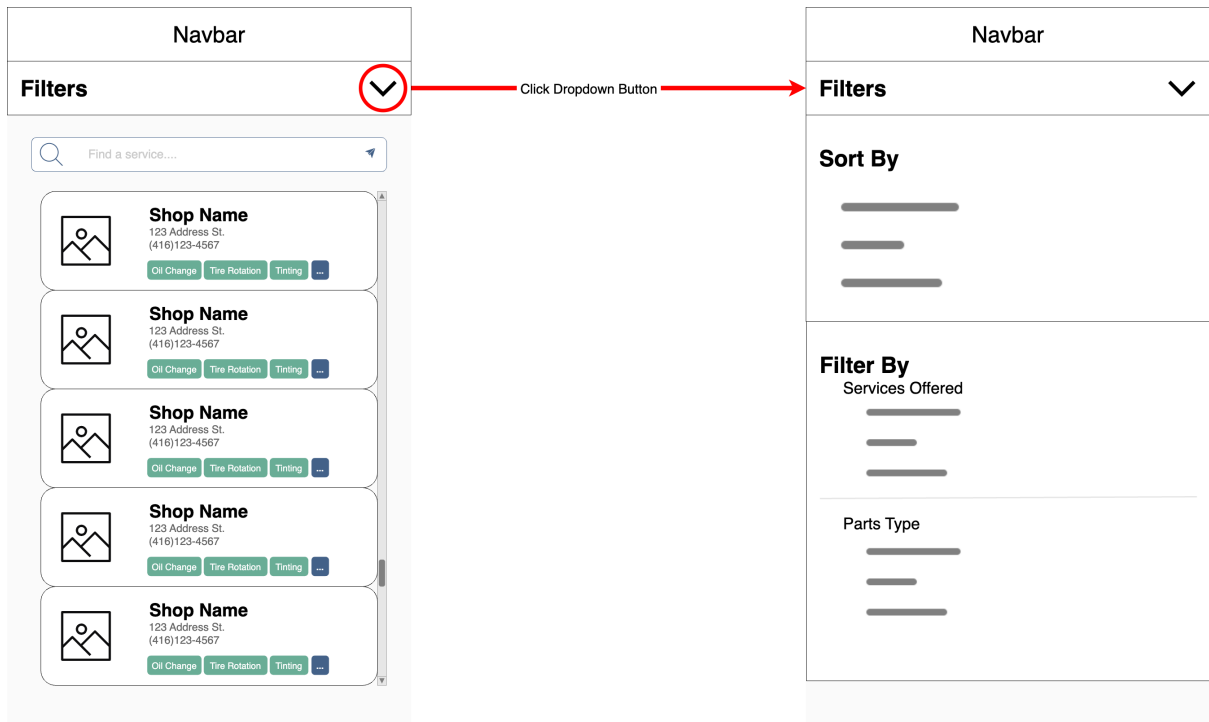


Figure 3: Home Page — Logged In (Mobile)

8.2 Manage Shop Employees

LOGO

Service Requests

Manage Shop

Profile

Logout

Services

Employees

<

Figure 4: Manage Shop — Employees (Desktop)

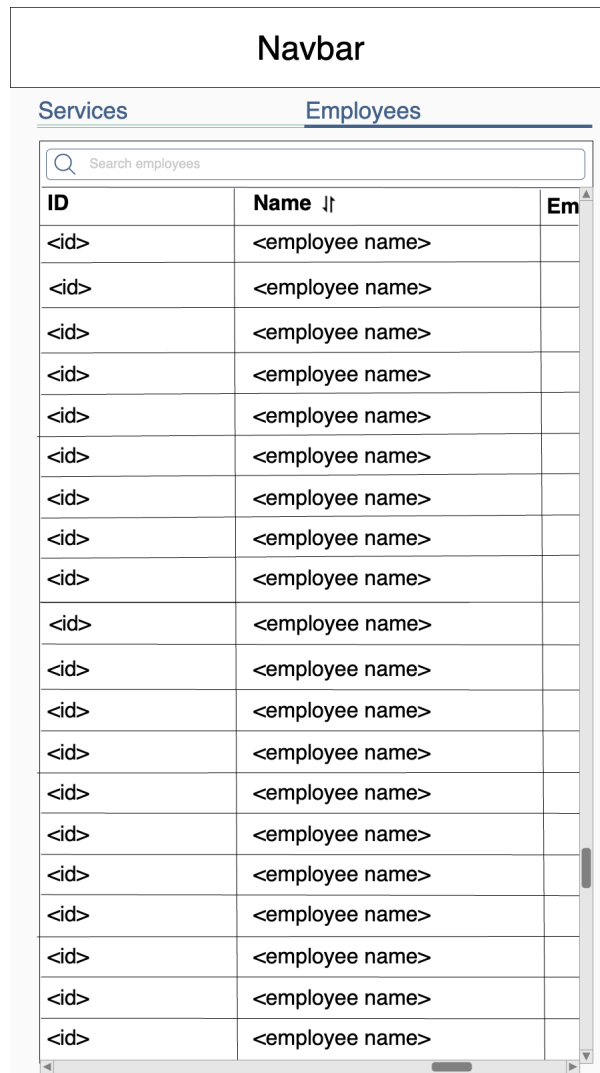


Figure 5: Manage Shop — Employees (Mobile)

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

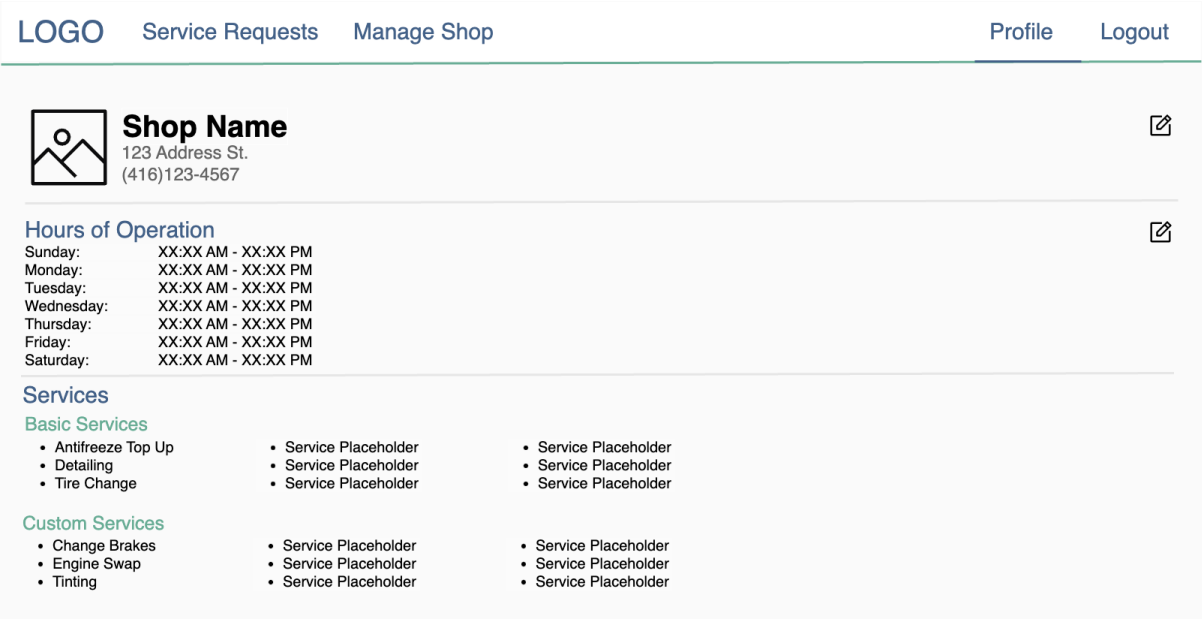


Figure 8: Shop Profile — Shop Owner (Desktop)

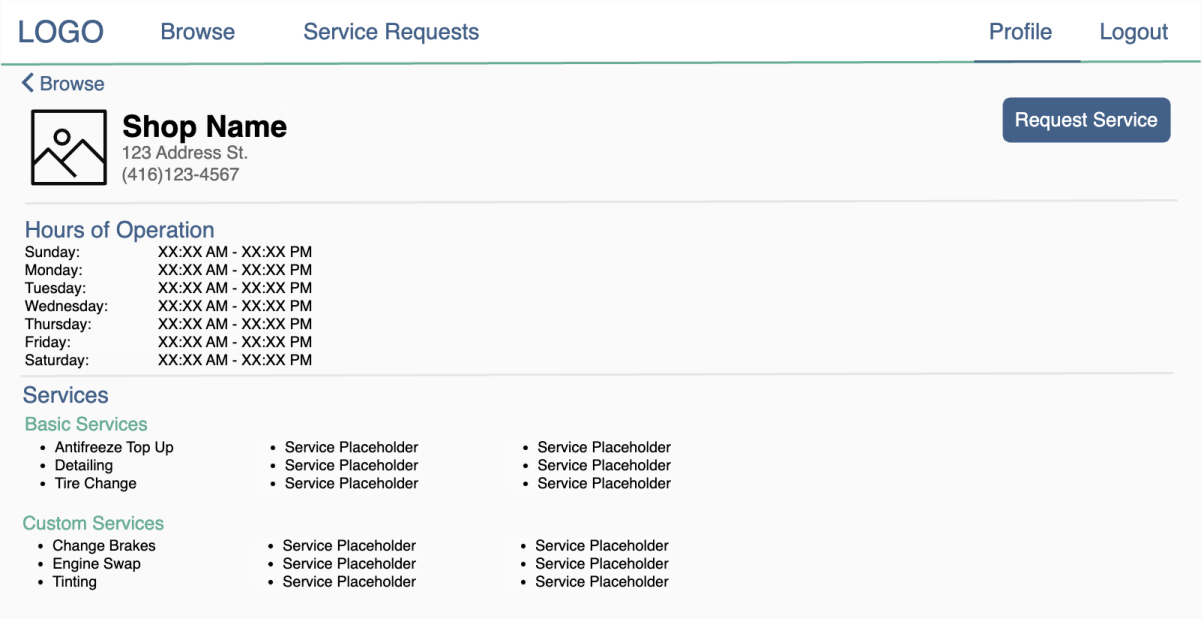


Figure 9: Shop Profile — Vehicle Owner (Desktop)

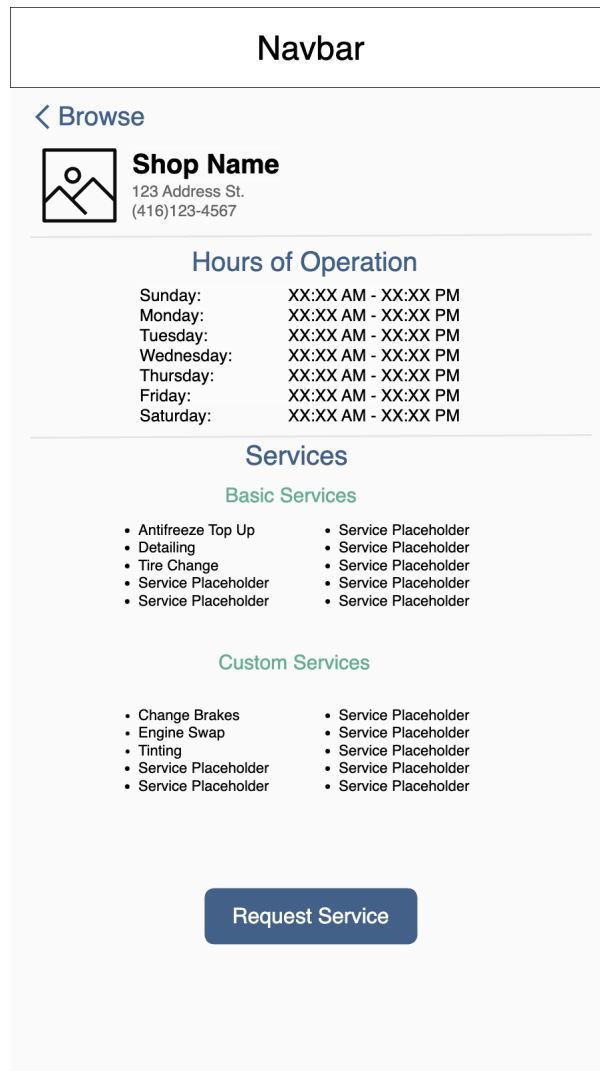


Figure 10: Shop Profile (Mobile)

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)

The image displays two side-by-side web application mockups, illustrating a design change for adding services.

Left Mockup (Basic Service):

- Navbar:** Contains "Shop Settings" and "Employees".
- Header:** "Shop ID: <shop id>" and "Basic Services" with an "Add Basic Service" button.
- Form:** A modal titled "Add Basic Service" with fields for:
 - Service Type (text input)
 - Description (text input)
 - Part Condition (dropdown menu, currently "New")
 - Part Type (dropdown menu, currently "Aftermarket")
 - Duration (in hours) (text input)
 - Estimated Cost (text input)and a "Save Basic Service" button.
- Table:** A table with columns "Service Type" and "Description". It contains 10 rows, each with a trash icon in the right margin.

Right Mockup (Custom Service):

- Navbar:** Contains "Shop Settings" and "Employees".
- Header:** "Shop ID: <shop id>" and "Basic Services" with an "Add Basic Service" button.
- Form:** A modal titled "Add Custom Service" with fields for:
 - Service Type (text input)
 - Description (text input)
 - Part Condition (dropdown menu, currently "New")
 - Part Type (dropdown menu, currently "Aftermarket")and a "Save Custom Service" button.
- Table:** A table with columns "Service Type" and "Description". It contains 10 rows, each with a trash icon in the right margin.

Figure 12: Add Service to Shop (Mobile)

8.6 Shop Owner/Employee Registration

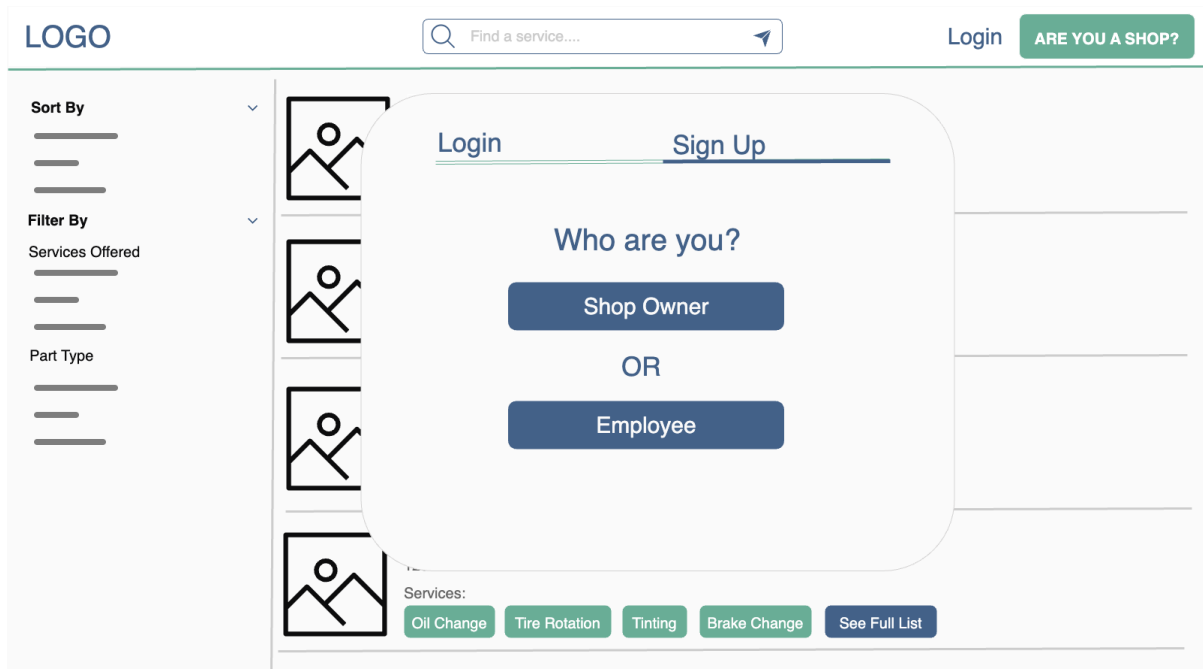


Figure 13: Shop Owner/Employee Registration — Part 1 (Desktop)

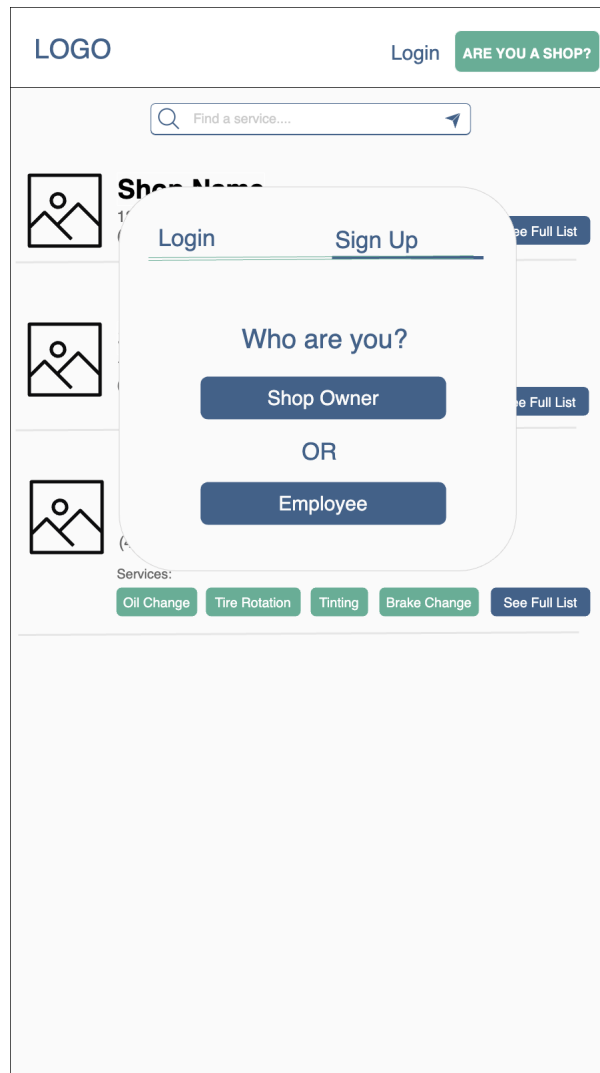


Figure 14: Shop Owner/Employee Registration — Part 1 (Mobile)

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

See Full List

See Full List

See Full List

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

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)

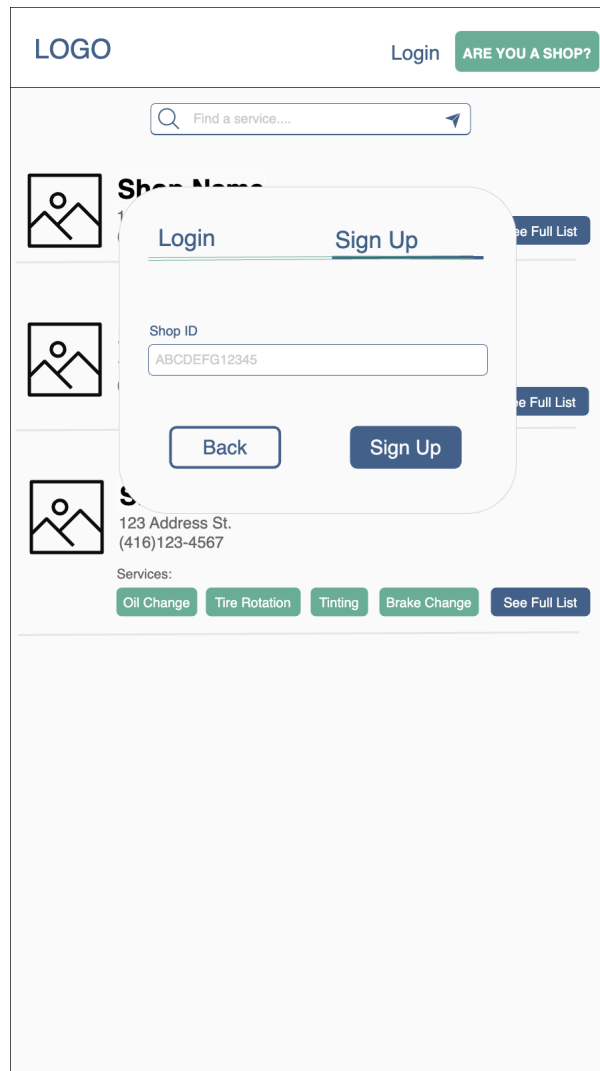


Figure 20: Employee Registration — Part 3 (Mobile)

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)

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)

LOGO

Login

ARE YOU A SHOP?

Find a service.....

Shop Name

15

See Full List

Shop Name

See Full List

Shop Name

See Full List

Login

Sign Up

Vehicle Make

Toyota

Vehicle Model

Corolla

Manufacture Year

2022

VIN

VIN

License Plate

#####

Back

Sign Up

Figure 24: Vehicle Owner Registration — Part 2 (Mobile)

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

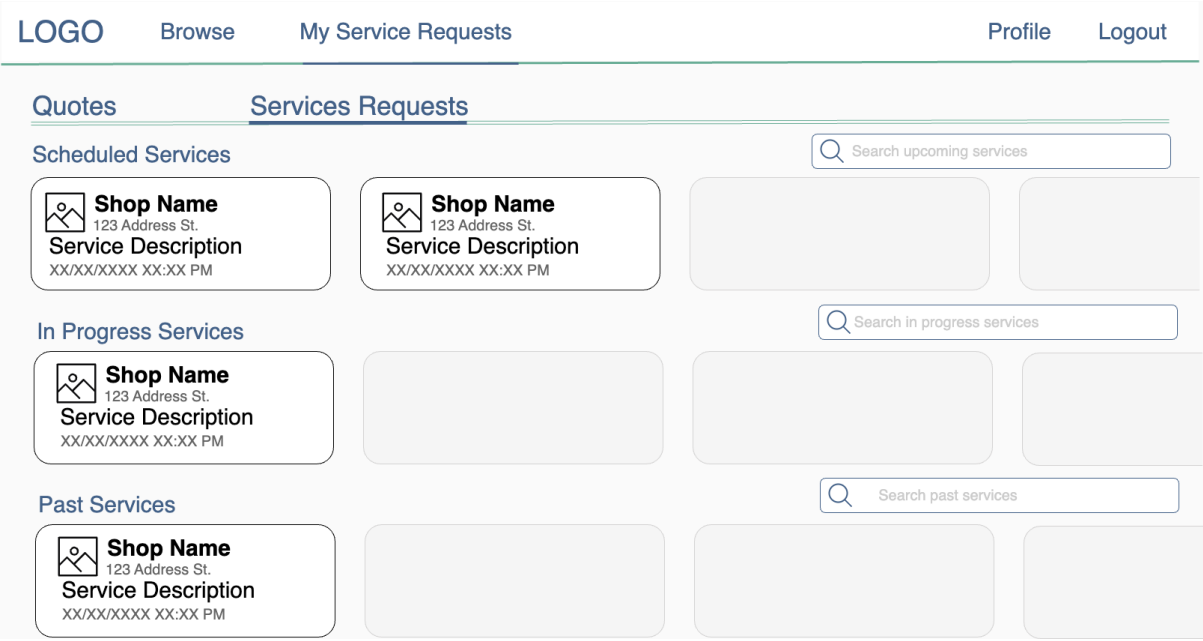


Figure 27: Vehicle Owner Dashboard — Service Requests (Desktop)

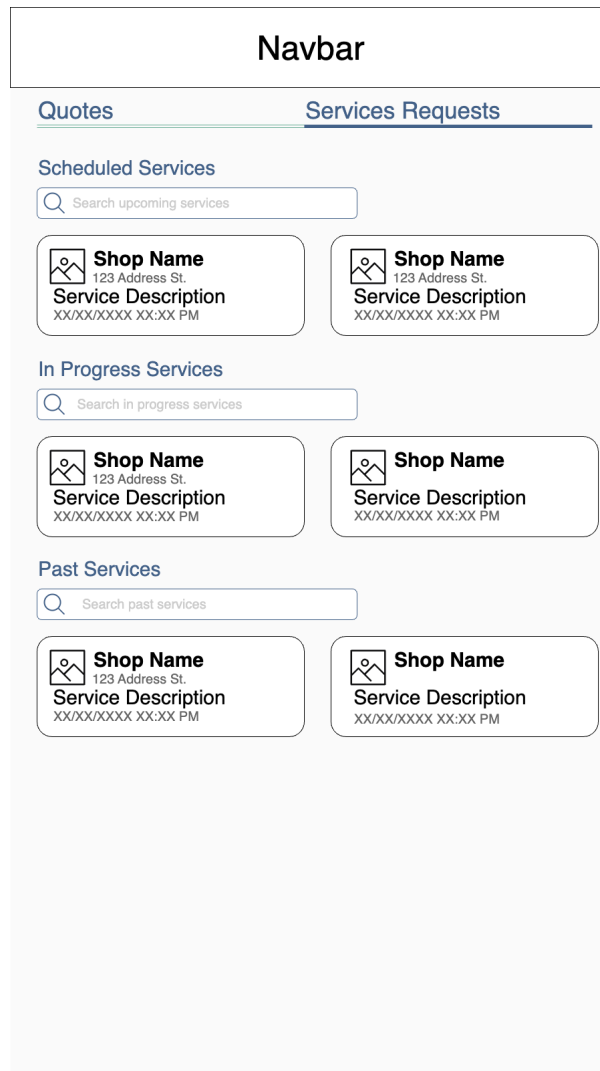


Figure 28: Vehicle Owner Dashboard — Service Requests (Mobile)

8.9.2 Quotes

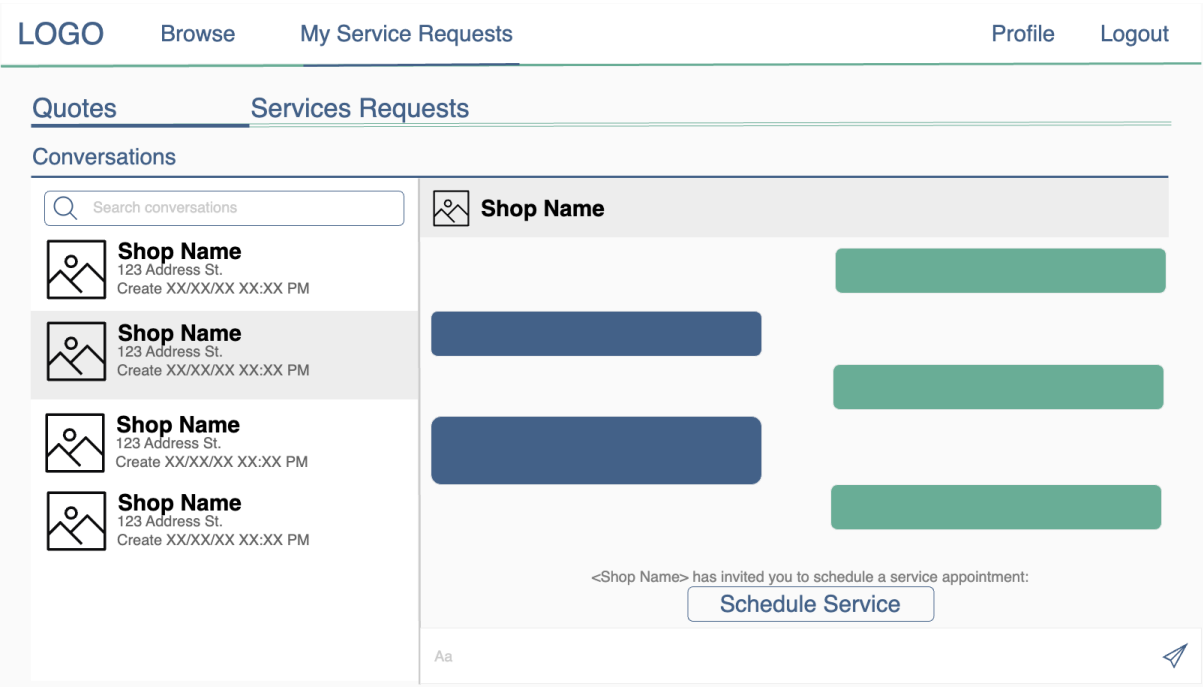


Figure 29: Vehicle Owner Dashboard — Quotes (Desktop)

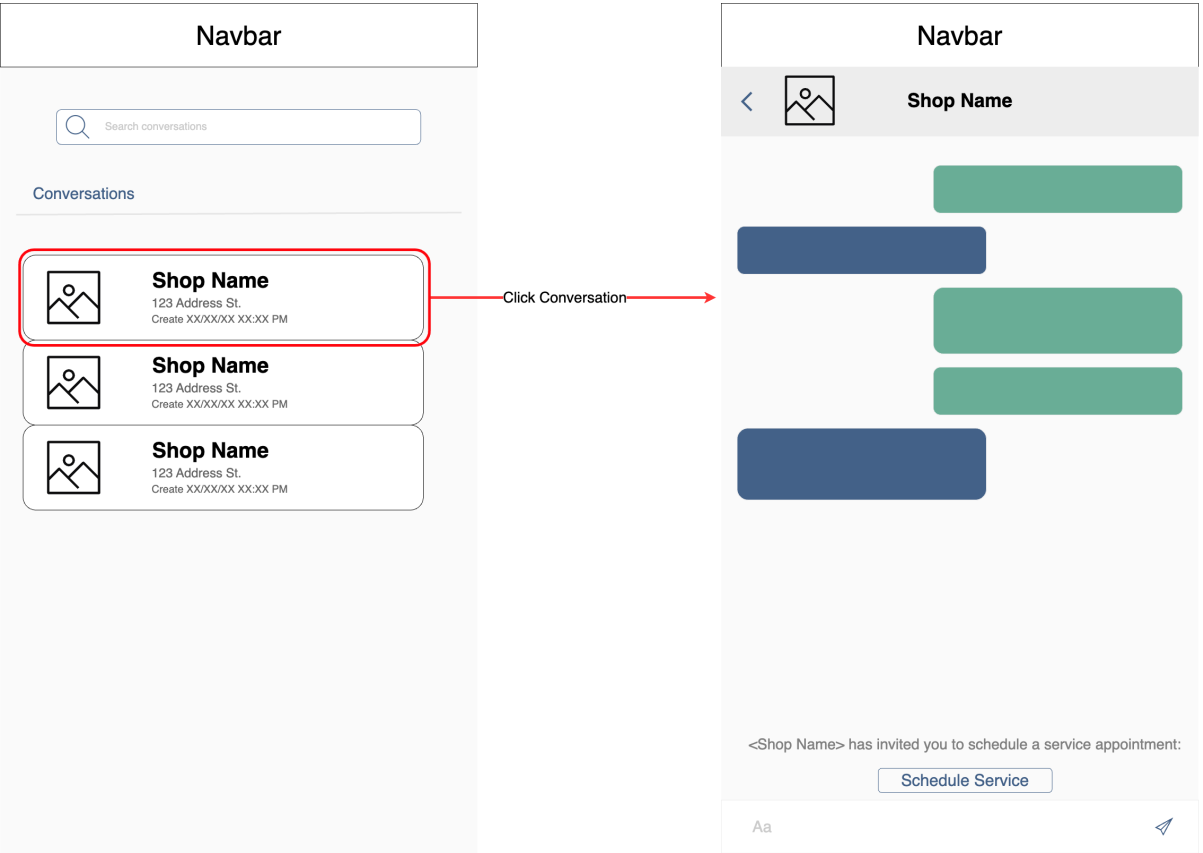


Figure 30: Vehicle Owner Dashboard — Quotes (Mobile)

8.10 Vehicle Owner Create Appointment

Shop Name

Select a Service

Service:

Oil Change
Tire Rotation
Filters
Brakes
General Maintenance
Other

Schedule Service / Proceed to Quote

* Button text will vary depending on type of service (i.e., canned or non-canned) selected

Shop Name

Create Appointment

Vehicle Year: 2015
Vehicle Make: Honda
Vehicle Model: Civic

Service: Oil Change
Appointment Date:

Estimated Cost: \$50
Estimated Time: 1 hour

* Estimated cost is labour cost only (will show up for canned job only)
Description (will only show up for non-canned job)

Description of service, same as the description from quote invitation

Schedule Service

On Click

Select Date

On Click, send back to initial form

Available Timeslots

Job Type: Tire Rotation
Duration: 1 hour

9:00 am
10:00 am
11:00 am
12:00 pm
1:00 pm
2:00 pm
3:00 pm
4:00 pm

Figure 31: Vehicle Owner Create Appointment (Desktop)

8.11 Shop Owner/Employee Dashboard

8.11.1 Quotes Requests

LOGO Service Requests Manage Shop Profile Logout

Quotes Services Requests

Conversations

Search conversations

Shop Name
123 Address St.
Create XX/XX/XX XX:XX PM

Shop Name
123 Address St.
Create XX/XX/XX XX:XX PM

Shop Name
123 Address St.
Create XX/XX/XX XX:XX PM

Shop Name
123 Address St.
Create XX/XX/XX XX:XX PM

Shop Name
123 Address St.
Create XX/XX/XX XX:XX PM

Invite to Schedule

Aa

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

Description

Description of service/job

Duration

1 hour

30 minutes

1 hour

1.5 hours

2 hours

2.5 hours

3 hours

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

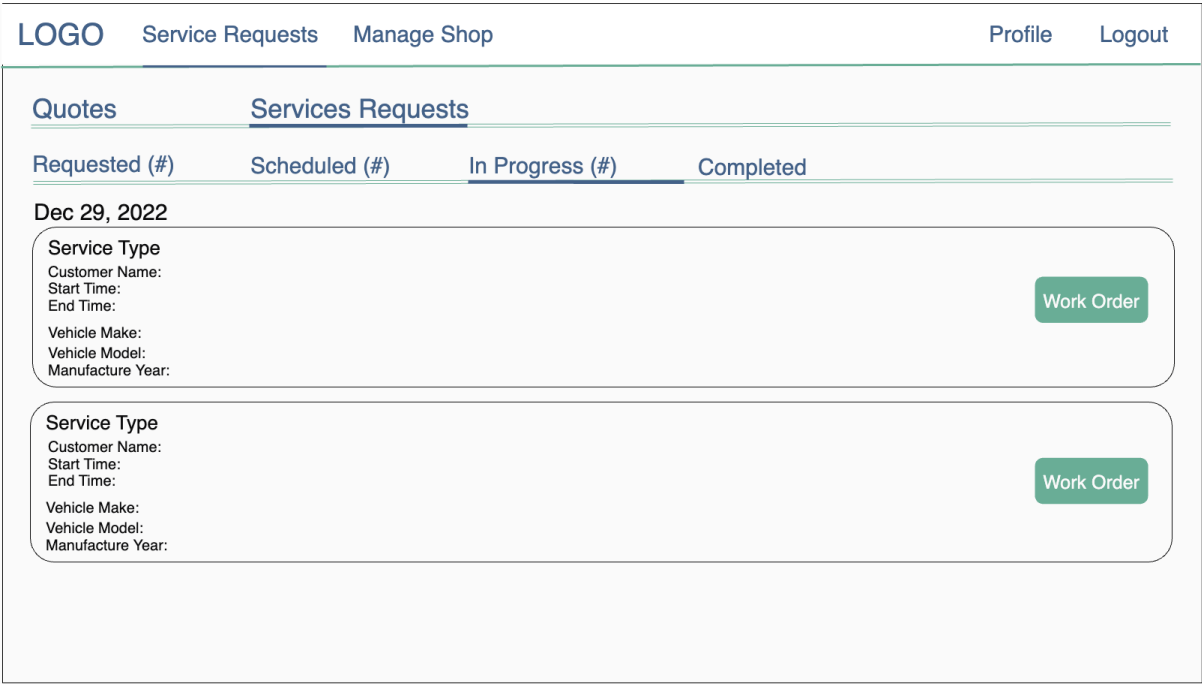


Figure 38: Shop Owner/Employee Dashboard — Service — In Progress (Desktop)

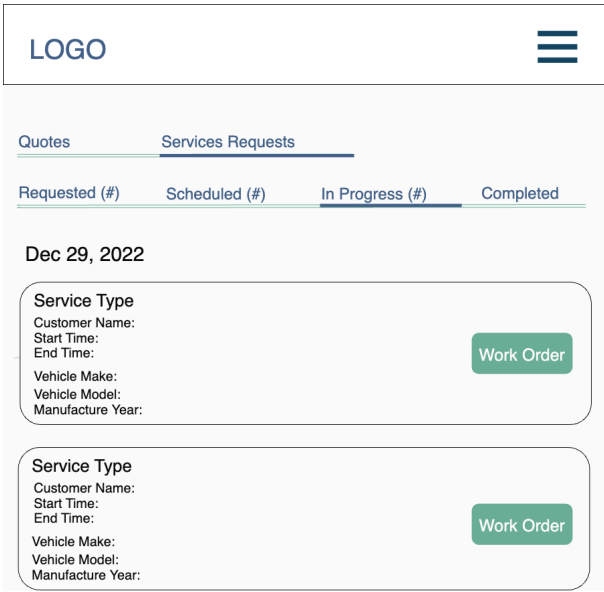


Figure 39: Shop Owner/Employee Dashboard — Service — In Progress (Mobile)

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)

LOGO

Quotes Services Requests

Requested (#) Scheduled (#) In Progress (#) Completed

Search ...

Start Date End Date

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:
Start Time:
End Time:
Vehicle Make:
Vehicle Model:
Manufacture Year:

Work Order

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)