

Software Requirements Specification for Sayyara: Progressive Web Application for Independent Automotive Repair Shop Industry

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Table 1: Revision History

Date	Developer(s)	Change
September 30, 2022	Leon So	Add purpose of project
September 30, 2022	Joy Xiao	Add stakeholders
September 30, 2022	Leon So	Add functional requirements for authentication
October 1, 2022	Timothy Choy	Add mandated constraints
October 2, 2022	Leon So	Add current situation and appointment diagram
October 2, 2022	Joy Xiao	Add current situation quote and invitation diagram
October 3, 2022	Leon So	Add current situation work order diagram
October 3, 2022	Leon So	Add functional requirements for employees management
October 3, 2022	Joy Xiao	Add appointment FRs
October 3, 2022	Arkin Modi	Add functional requirements for work orders
October 4, 2022	Leon So	Add context of work diagram
October 4, 2022	Leon So	Add SRS subtitle
October 4, 2022	Joy Xiao	Add service functional requirements
October 5, 2022	Leon So	Add functional requirements for password reset

This document describes the requirements for The template for the Software Requirements Specification (SRS) is a subset of the Volere template ([Robertson and Robertson, 2012](#)). If you make further modifications to the template, you should explicitly state what modifications were made.

1 Project Drivers

1.1 The Purpose of the Project

Independent auto repair shops do not have an efficient way of reaching and interacting with new customers. Currently, many independent shop owners rely on word-of-mouth referrals as a main channel to acquiring new customers. Independent auto repair shops are also spending a significant amount of their time on administrative work such as managing appointments and providing quotes. As a result, independent auto repair shops have a difficult time competing with larger repair shops which have dedicated systems and services in place.

On the other hand, customers do not have an effective way to find and compare auto repair shops. Currently, one of the only ways to compare repair shops is by manually searching or reaching out to repair shops one-by-one. This process can often be repetitive and time-consuming.

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. Vehicle owners can search for auto repair shops and services based on a variety of search filters; request quotes for service; book, view, and manage service appointments. On the application, auto repair shop owners will have full shop management capabilities such as: adding and managing a list of employees; managing a list of service types and corresponding service appointment availabilities; managing store information such as location, hours of operation, and contact information. Auto repair shop owners and employees will be able to manage quotes, service appointments, and work orders from a single application. Ultimately, Sayyara will significantly improve the auto repair experience for both independent auto repair shops and vehicle owners.

1.2 The Stakeholders

1.2.1 The Client

The client of the project is Nabeel Ibrahim. Nabeel will be the point of contact throughout the development of the project.

1.2.2 The Customers

The customers of Sayyara will be independent auto repair shop owners, shop employees, and vehicle owners who are looking for a vehicle repair or maintenance service.

1.2.3 Other Stakeholders

Other stakeholders of the project are the developers, Tiny Coders, who are designing and implementing the project.

1.3 Mandated Constraints

1.3.1 Solution Constraints

Description: The product shall be built as a Progressive Web Application (PWA)

Rationale: The supervisor wants the application to be a PWA

Fit Criterion: The product shall be written using the Next.js PWA plugin

Description: The product shall be able to function on a variety of devices, such as on a computer, on tablets and on most modern phones

Rationale: Users will be accessing this product in a variety of scenarios, and will have access to different devices

Fit Criterion: The product shall be tested to function properly on Chrome's device toolbar, which includes the following devices:

- iPhone SE
- iPhone XR
- iPhone 12 Pro
- Pixel 5
- Samsung Galaxy S8+
- Samsung Galaxy S20 Ultra
- iPad Air
- iPad Mini
- Surface Pro 7
- Surface Duo
- Galaxy Fold
- Samsung Galaxy A51/71
- Nest Hub
- Nest Hub Max

However, due to timing constraints, testing will only be run on the most popular cases, which would include the iPhone, Pixel and Samsung phones, as well as iPad and Galaxy tablets.

1.3.2 Implementation Environment of the Current System

In the current design of the product, the product shall be implemented in a cloud hosted serverless environment. In this specific case, it shall be AWS Lambda. The product itself shall also be able to function properly with any web browser and operating system.

1.3.3 Partner or Collaborative Applications

In the current design of the product, there are no partner or collaborative applications that will work along with the product. Therefore, there are no partner or collaborative constraints.

1.3.4 Off-the-Shelf Software

The following off-the-shelf software will be utilized:

- Next.js (and Next PWA)

1.3.5 Anticipated Workplace Environment

The anticipated workplace environment will be very broad. The product can be used from anywhere the user has access to a device and internet to run the application.

1.3.6 Schedule Constraints

As stated in the SFWRENG 4G06 course outline, the schedule constraints are as follows:

Table 2: Schedule Constraints

Date	Deliverable
Oct 19, 2022	Hazard Analysis
Nov 2, 2022	Verification and Validation Plan
Nov 14-25, 2022	Proof of Concept Demo
Jan 18, 2023	Design Document
Feb 6-17, 2023	Revision 0 Demo
Mar 8, 2023	Verification and Validation Report
Mar 20-31, 2023	Final Demo (Rev 1)
Apr 5, 2023	Final Documentation

1.3.7 Budget Constraints

The project has no monetary budget. If there are any necessary purchases for development, the cost shall be paid by the project members and reimbursed by the supervisor. Furthermore, these purchases may not exceed \$750.

1.3.8 Enterprise Constraints

The project will require authentication in the form of users logging in. The current implementation of the project will require users to authenticate with a username and password. In the future, SSO may be used.

1.4 Naming Conventions and Terminology

1.5 Relevant Facts and Assumptions

User characteristics should go under assumptions.

2 Functional Requirements

2.1 The Scope of the Work and the Product

2.1.1 The Current Situation

The current interactions between independent auto repair shop owners, employees, and customers (i.e., vehicle owners), are often a manual process. Outlined below are models for interactions between the independent auto repair shop owners, employees, customers, and the proposed system.

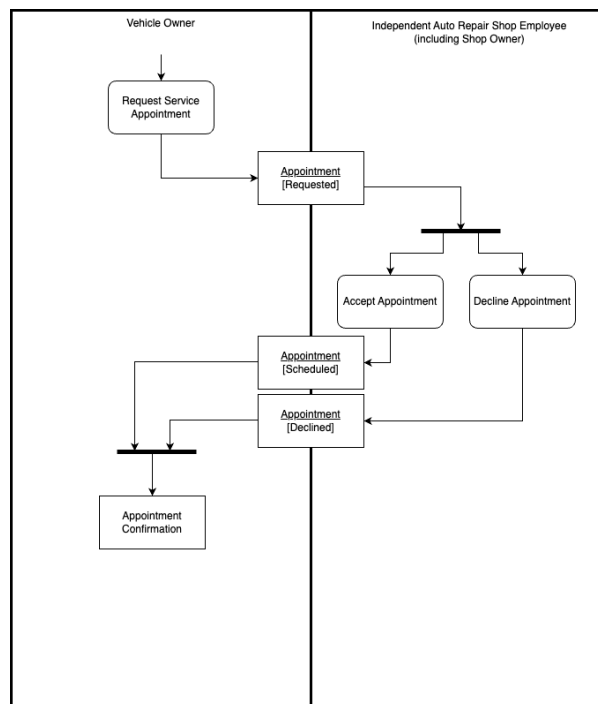


Figure 1: Service Appointments

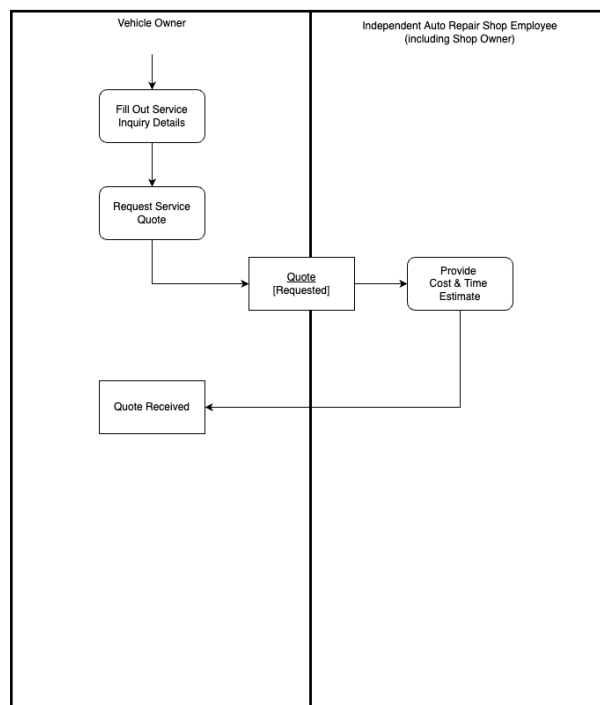


Figure 2: Service Quotes

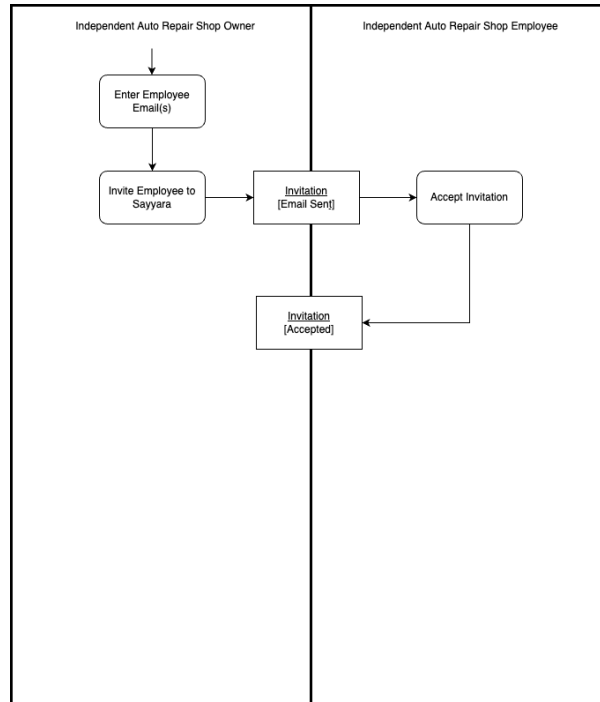


Figure 3: Employee Invitation to Join Auto Repair Shop

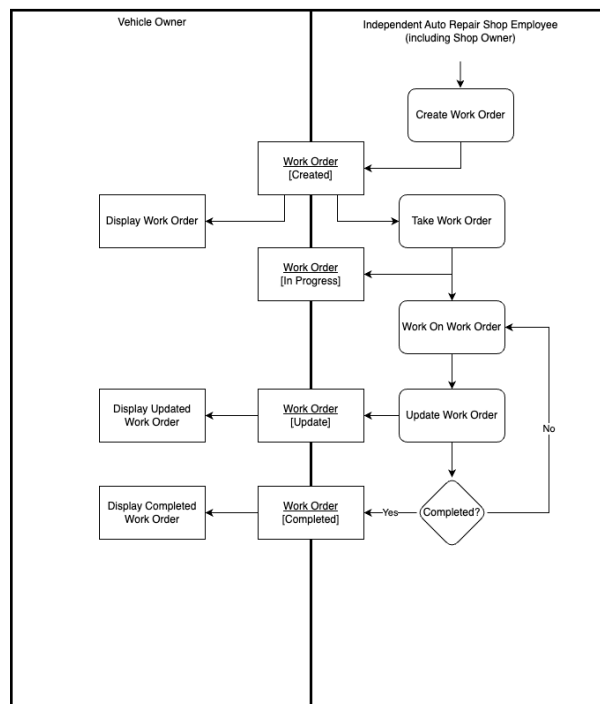


Figure 4: Work Orders

2.1.2 Context of the Work

The context diagram depicted below illustrates the interactions of the system with adjacent external systems and services.

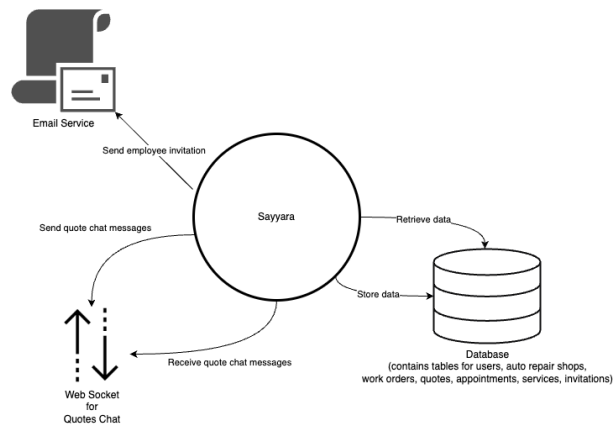


Figure 5: Context Diagram (Sayyara)

2.1.3 Work Partitioning

2.1.4 Individual Product Use Cases

2.2 Functional Requirements

2.2.1 Authentication

BE1. The user wants to sign up for an account

VP1. Viewpoint: Vehicle Owner

- i. The system shall allow the user to enter an email and password
- ii. The system shall allow the user to enter their name
- iii. The system shall allow the user to enter their phone number
- iv. The system shall transition to the vehicle owner landing page after the registration process is complete and successful
- v. The system shall allow the user to cancel and exit the registration process

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter an email and password
- ii. The system shall allow the user to enter their name
- iii. The system shall allow the user to enter their phone number
- iv. The system shall allow the user to enter the shop name
- v. The system shall allow the user to enter the shop address
- vi. The system shall allow the user to enter the shop phone number
- vii. The system shall transition to the shop owner landing page after the registration process is complete and successful
- viii. The system shall allow the user to cancel and exit the registration process

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to enter an email and password
- ii. The system shall allow the user to enter their name
- iii. The system shall allow the user to enter their phone number
- iv. The system shall transition to the employee landing page after the registration process is complete and successful
- v. The system shall allow the user to cancel and exit the registration process

BE2. The user wants to login to their account

VP1. Viewpoint: Vehicle Owner

- i. The system shall allow the user to enter their email and password
- ii. The system shall transition to the vehicle owner landing page after the login process is complete and successful
- iii. The system shall allow the user to cancel and exit the login process

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter their email and password
- ii. The system shall transition to the shop owner landing page after the login process is complete and successful
- iii. The system shall allow the user to cancel and exit the login process

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to enter their email and password
- ii. The system shall transition to the employee landing page after the login process is complete and successful
- iii. The system shall allow the user to cancel and exit the login process

BE3. The user wants to reset their password

VP1. Viewpoint: Vehicle Owner

- i. The system shall allow the user to enter their email
- ii. The system shall send a password reset code to the email if the email is associated with an account
- iii. The system shall display a countdown for the password reset code expiration
- iv. The system shall ask the user for a new password if the code matches

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter their email
- ii. The system shall send a password reset code to the email if the email is associated with an account
- iii. The system shall display a countdown for the password reset code expiration
- iv. The system shall ask the user for a new password if the code matches

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to enter their email
- ii. The system shall send a password reset code to the email if the email is associated with an account

- iii. The system shall display a countdown for the password reset code expiration
- iv. The system shall ask the user for a new password if the code matches

2.2.2 Appointments

BE4. The user wants to book an appointment

VP1. Viewpoint: Vehicle Owner

- i. The system shall populate the service request information from the quote
- ii. The system shall populate the service request information from the if a canned job is selected
- iii. The system shall allow the user to filter available appointments times
- iv. The system shall display dates and times where appointments are available
- v. The system shall allow the user to select an appointment time slot to book
- vi. The system shall allow the user to sync the appointment time to their calendar
- vii. The system shall transition to the view appointments page
- viii. The system shall allow the user to cancel and exit the appointment process

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter a name
- ii. The system shall allow the user to enter a phone number
- iii. The system shall allow the user to enter service details
- iv. The system shall allow the user to select an available time slot
- v. The system shall transition to the view appointments page
- vi. The system shall allow the user to cancel and exit the appointment process

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to enter a name
- ii. The system shall allow the user to enter a phone number
- iii. The system shall allow the user to enter service details
- iv. The system shall allow the user to select an available time slot
- v. The system shall transition to the view appointments page
- vi. The system shall allow the user to cancel and exit the appointment process

BE5. The user wants to edit an appointment

VP1. Viewpoint: Vehicle Owner

- i. The system shall allow the user to select a scheduled appointment
- ii. The system shall allow the user to select another available timeslot

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to select a scheduled appointment
- ii. The system shall allow the user to update service details
- iii. The system shall allow the user to select another available timeslot

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to select a scheduled appointment
- ii. The system shall allow the user to update service details
- iii. The system shall allow the user to select another available timeslot

BE6. The user wants to cancel an appointment

VP1. Viewpoint: Vehicle Owner

- i. The system shall allow the user to select a scheduled appointment
- ii. The system shall allow the user to cancel the appointment

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to select a scheduled appointment
- ii. The system shall allow the user to cancel the appointment

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to select a scheduled appointment
- ii. The system shall allow the user to cancel the appointment

BE7. The user wants to set appointment availability

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to set the days that appointments can be made
- ii. The system shall allow the user to set the hours that appointments can be made
- iii. The system shall allow the user to set the number of appointments that can be booked every hour

VP3. Viewpoint: Auto Repair Shop Employee

N/A

2.2.3 Work Orders

BE8. An appointment has been scheduled

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall create a work order
- ii. The system shall populate the customer data and vehicle data from the quote
- iii. The system shall populate the customer data and vehicle data from the appointment if the quote is not available
- iv. The system shall populate expected services performed and parts needed from the quote
- v. The system shall populate expected services performed and parts needed from the appointment if the quote not available

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall create a work order
- ii. The system shall populate the customer data and vehicle data from the quote
- iii. The system shall populate the customer data and vehicle data from the appointment if the quote is not available
- iv. The system shall populate expected services performed and parts needed from the quote
- v. The system shall populate expected services performed and parts needed from the appointment if the quote not available

BE9. An appointment has been cancelled

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall delete the associated work order

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall delete the associated work order

BE10. The user wants to search for a work order

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter the customer name, assigned employee, service type, and a date range
- ii. The system shall list the work order matching the inputted criteria

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to enter the customer name, assigned employee, service type, and a date range
- ii. The system shall list the work order matching the inputted criteria

BE11. The user wants to view past work orders

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall list the past work orders

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall list the past work orders

BE12. The user wants update an work order

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall list the open work orders
- ii. The system shall allow the user to edit the services performed, parts required, odometer readings, customer details, employee assigned, car details, discounts, digital vehicle inspection, and extra notes
- iii. The system shall update the work order with the entered values

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall list the open work orders
- ii. The system shall allow the user to edit the services performed, parts required, odometer readings, customer details, employee assigned, car details, discounts, digital vehicle inspection, and extra notes
- iii. The system shall update the work order with the entered values

BE13. The customer has paid for the work done on their vehicle

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall send a copy of the work order to the assigned customer's email
- ii. The system shall mark the work order as "Completed"
- iii. The system shall mark the associated appointment as "Completed"

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall send a copy of the work order to the assigned customer's email
- ii. The system shall mark the work order as "Completed"
- iii. The system shall mark the associated appointment as "Completed"

BE14. The user wants to view the details of a work order

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall list the shop details, services to be performed with their individual bill rates and expected number of hours for completion, parts required and their cost, odometer reading before and after service, customer details, assigned employee, car details, any applied discounts, final balance for the customer, warranty information, digital vehicle inspection, and any extra notes

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall list the shop details, services to be performed with their individual bill rates and expected number of hours for completion, parts required and their cost, odometer reading before and after service, customer details, assigned employee, car details, any applied discounts, final balance for the customer, warranty information, digital vehicle inspection, and any extra notes

2.2.4 Employee Management

BE15. The shop owner wants to invite an employee to their shop

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter employee email(s) to invite
- ii. The system shall send an invitation email to the invited employee(s)

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall allow the user to accept an invitation

BE16. The shop owner wants to search for an employee

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter search text to search for an employee
- ii. The system shall display a list of employees whose name or email matches the search text

VP3. Viewpoint: Auto Repair Shop Employee

N/A

BE17. The shop owner wants to view the list of employees

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall display a list of employees

VP3. Viewpoint: Auto Repair Shop Employee

N/A

BE18. The shop owner wants to remove an employee

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to remove an employee
- ii. The system shall revoke the removed employee's access to the auto repair shop employee controls

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall revoke the removed employee's access to the auto repair shop employee controls

2.2.5 Services

BE19. The user wants to add available auto shop services to the shop profile

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to enter the name of the service
- ii. The system shall allow the user to enter a description for the service
- iii. The system shall allow the user to enter the estimated time for the service
- iv. The system shall allow the user to enter the parts used for the service including quantity, condition (new or used), build (OEM or aftermarket), and cost per part (before tax cost)
- v. The system shall allow the user to enter the total price for the service (before tax price)

VP3. Viewpoint: Auto Repair Shop Employee

N/A

BE20. The user wants to search for auto repair or maintenance services

VP1. Viewpoint: Vehicle Owner

- i. The system shall display the service details

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall display the service details
- ii. The system shall allow the user to search for a specific service type

VP3. Viewpoint: Auto Repair Shop Employee

- i. The system shall display the service details
- ii. The system shall allow the user to search for a specific service type

BE21. The user wants to edit a service type

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to update the details of a particular service

VP3. Viewpoint: Auto Repair Shop Employee

N/A

BE22. The user wants to delete a service type

VP1. Viewpoint: Vehicle Owner

N/A

VP2. Viewpoint: Auto Repair Shop Owner

- i. The system shall allow the user to delete the service from their shop page

VP3. Viewpoint: Auto Repair Shop Employee

N/A

3 Non-functional Requirements

3.1 Look and Feel Requirements

3.2 Usability and Humanity Requirements

3.3 Performance Requirements

3.4 Operational and Environmental Requirements

3.5 Maintainability and Support Requirements

3.6 Security Requirements

3.7 Cultural Requirements

3.8 Legal Requirements

3.9 Health and Safety Requirements

This section is not in the original Volere template, but health and safety are issues that should be considered for every engineering project.

4 Project Issues

4.1 Open Issues

4.2 Off-the-Shelf Solutions

4.3 New Problems

4.4 Tasks

4.5 Migration to the New Product

4.6 Risks

4.7 Costs

4.8 User Documentation and Training

4.9 Waiting Room

4.10 Ideas for Solutions

References

James Robertson and Suzanne Robertson. *Volere Requirements Specification Template*.
Atlantic Systems Guild Limited, 16 edition, 2012.

[The following is not part of the template, just some things to consider when filing in the template. —TPLT]

[Grammar, flow and L^AT_EX advice:

- For Mac users *.DS_Store should be in .gitignore
- L^AT_EX and formatting rules
 - Variables are italic, everything else not, includes subscripts ([link to document](#))
 - * [Conventions](#)
 - * Watch out for implied multiplication
 - Use BibTeX
 - Use cross-referencing
- Grammar and writing rules
 - Acronyms expanded on first usage (not just in table of acronyms)
 - “In order to” should be “to”

—TPLT]

[Advice on using the template:

- Difference between physical and software constraints
- Properties of a correct solution means *additional* properties, not a restating of the requirements (may be “not applicable” for your problem). If you have a table of output constraints, then these are properties of a correct solution.
- Assumptions have to be invoked somewhere
- “Referenced by” implies that there is an explicit reference
- Think of traceability matrix, list of assumption invocations and list of reference by fields as automatically generatable
- If you say the format of the output (plot, table etc), then your requirement could be more abstract

—TPLT]

5 Appendix

This section has been added to the Volere template. This is where you can place additional information.

5.1 Reflection

The information in this section will be used to evaluate the team members on the graduate attribute of Lifelong Learning. Please answer the following questions:

1. What knowledge and skills will the team collectively need to acquire to successfully complete this capstone project? Examples of possible knowledge to acquire include domain specific knowledge from the domain of your application, or software engineering knowledge, mechatronics knowledge or computer science knowledge. Skills may be related to technology, or writing, or presentation, or team management, etc. You should look to identify at least one item for each team member.
2. For each of the knowledge areas and skills identified in the previous question, what are at least two approaches to acquiring the knowledge or mastering the skill? Of the identified approaches, which will each team member pursue, and why did they make this choice?

5.2 Symbolic Parameters

The definition of the requirements will likely call for `SYMBOLIC_CONSTANTS`. Their values are defined in this section for easy maintenance.