Lab 2 - Refill.Me Prototype Product Specification

Team Iron

Old Dominion University

CS411W

Professor Sarah Hosni

Version 1

Table of Contents

3.   Specific Requirements

3.1.   Functional Requirements

    3.1.1.   User Interface

        3.1.1.1.   Welcome Screen (*O: Colombini, M1: Chang*)

            3.1.1.1.1.   The welcome screen shall meet the following requirements:

                3.1.1.1.1.1.   Provide a clear and concise message to the user, informing them of the purpose and benefits of the application.

                3.1.1.1.1.2.   The welcome screen shall display the application logo.

                3.1.1.1.1.3.   The welcome screen shall display a button to login into the application or to create an account.

                3.1.1.1.1.4.   The welcome screen should provide navigation options for returning users, allowing them to quickly access the main functionality of the application.

                3.1.1.1.1.5.   The welcome screen shall have a responsive design that adjusts to the screen size and orientation of the user's device.

                3.1.1.1.1.6.   The welcome screen shall have an appealing design that aligns with the overall branding and style of the application.

        3.1.1.2.   Login Screen (*O: Colombini, M1: Chang*)

3.1.1.2.1.   The login screen shall meet the following requirements:

3.1.1.2.1.1.   The login screen shall be secure and require users to authenticate themselves before gaining access to the application.

3.1.1.2.1.2.   The login screen shall require users to enter their username and password to authenticate their identity.

3.1.1.2.1.3.   The login screen shall provide a "forgot password" feature to allow users reset their password in case they forgot it.

3.1.1.2.1.4.   The login screen should include a "remember me" option to allow users to stay logged in on the device they are using.

3.1.1.2.1.5.   The login screen should include different authentication methods, such as social media, multi-factor authentication, biometric authentication, and other types of authentication.

3.1.1.2.1.6.   The login screen shall provide feedback to users if they enter incorrect login credentials, including error messages that are easy to understand and actionable.

3.1.1.2.1.7. The login screen shall have a responsive design that adjusts to the screen size and orientation of the user's device.

3.1.1.2.1.8. The login screen shall have an appealing design that aligns with the overall branding and style of the application.

3.1.1.3. Registration Screen (*O: Colombini, M1: Chang*)

3.1.1.3.1. The registration screen shall meet the following requirements:

3.1.1.3.1.1. The registration screen shall collect users information such as name, email, username, password, and any other required information necessary for account creation.

3.1.1.3.1.2. The registration screen shall validate user passwords for strength and complexity and provide feedback to users if they enter a weak password.

3.1.1.3.1.3. The registration screen shall require email verification to ensure that the email address entered by the user is valid and belongs to the user.

3.1.1.3.1.4. The registration screen should offer social media login options such as sign up with Google, Facebook, ect.

3.1.1.3.1.5.   The registration screen shall display password

requirements, such as minimum length, special

character requirements, and other specifications

necessary for account security.

3.1.1.3.1.6.   The registration screen shall provide feedback to

users if they enter incorrect or incomplete

information, including error messages that are easy

to understand and actionable.

3.1.1.3.1.7.   The registration screen shall have a responsive

design that adjusts to the screen size and orientation

of the user's device.

3.1.1.3.1.8.   The registration screen shall have an appealing

design that aligns with the overall branding and

style of the application.

3.1.1.4.   User Profile Dashboard (*O: Colombini, M1: Chang*)

3.1.1.4.1.   The user profile dashboard screen shall meet the following

requirements:

3.1.1.4.1.1.   The user profile dashboard screen shall display user

account information, including name, profile

picture, and other relevant information.

3.1.1.4.1.2.   The user profile dashboard screen shall display the

users saved stores, an option for users to share the

application with friends, and their profile settings.

3.1.1.4.1.3.   The user profile dashboard screen should offer

search functionality to help users quickly find

relevant information or content with the application.

3.1.1.4.1.4.   The user profile screen should display notifications

related to account activity, messages, updates, or

alerts.

3.1.1.4.1.5.   The user profile dashboard screen shall have a

responsive design that adjusts to the screen size and

orientation of the user's device.

3.1.1.4.1.6.   The user profile dashboard screen shall have an

appealing design that aligns with the overall

branding and style of the application.

3.1.1.5.   User Home Screen (*O: Colombini, M1: Chang*)

3.1.1.5.1.   The user home screen shall meet the following

requirements:

3.1.1.5.1.1.   The user home screen shall have a store search

button that allows users to search for nearby

package-free stores.

3.1.1.5.1.2.   The user home screen shall have a product search

button that allows users to search for products.

3.1.1.5.1.3.   The user home screen shall have a container guide

button that provides users with information about

the different containers utilized in package-free

shopping.

3.1.1.5.1.4.   The user home screen shall provide a shopping list

button that allows the user to create, manage, and

edit their shopping lists.

3.1.1.5.1.5.   The user home screen shall provide a Reward.Me

button that displays information on loyalty

programs, discounts, and other rewards offered by

the application.

3.1.1.5.1.6.   The user home screen shall have an advocacy and

petition site button that allows users to access and

sign petitions related to package-free shopping

environmental causes.

3.1.1.5.1.7.   The user home screen shall have a contact us button

that allows users to contact customer support for

help and assistance.

3.1.1.5.1.8.   The user home screen shall display a navigation

menu that allows users easy access to different areas

of the application and includes the following

buttons:

3.1.1.5.1.8.1.   A user home screen button.

3.1.1.5.1.8.2.   A store search screen button.

3.1.1.5.1.8.3.   A product search screen button.

3.1.1.5.1.8.4.   A user shopping list screen button.

3.1.1.5.1.8.5.   A profile dashboard screen button.

3.1.1.5.1.9.   The user home screen should offer a search

functionality to help users quickly find relevant

information or content within the application.

3.1.1.5.1.10.   The user home screen shall have a responsive

design that adjusts to the screen size and orientation

of the user's device.

3.1.1.5.1.11.   The user home screen shall have an appealing

design that aligns with the overall branding and

style of the application.

3.1.1.6.   Container Guide Screen(*O: Colombini, M1: Chang*)

3.1.1.6.1.   The container guide screen shall meet the following

requirements:

3.1.1.6.1.1.   The container guide screen shall display

information about the different types of containers

that can be used for package-free shopping,

including pictures, descriptions, and recommended

uses.

3.1.1.6.1.2.   The container guide screen shall be organized in a

clear and logical manner, making it easy for users to

find the information they are looking for or learning

from.

3.1.1.6.1.3.   The container guide screen should include

interactive features such as clickable images,

clickable links to products for purchase, videos, or

animations that provide additional information or

demonstrate how to use different types of

containers.

3.1.1.6.1.4.   The container guide should provide support for

multiple languages to accommodate users with

different language backgrounds.

3.1.1.6.1.5.   The container guide screen should offer a search

functionality to help users quickly find relevant

information or content within the application.

3.1.1.6.1.6.   The container guide screen shall have a responsive

design that adjusts to the screen size and orientation

of the user's device.

3.1.1.6.1.7.   The container guide screen shall have an appealing

design that aligns with the overall branding and

style of the application.

3.1.1.7.   User Shopping List Screen (*O: Pathan, M1: Chang*)

3.1.1.7.1.   The User Shopping List Screen shall meet the following

requirements:

3.1.1.7.1.1.   The User Shopping List screen shall display

shopping items in their own section blocks.

3.1.1.7.1.2.   The User Shopping List screen shall have the

following elements in each Shopping List Item:

3.1.1.7.1.2.1.   Quantity

3.1.1.7.1.2.2.   Container Recommendation icon

3.1.1.7.1.2.3.   Unit Price

3.1.1.7.1.3.   The User Shopping List screen shall be titled as

'My Shopping List' on the header of the screen.

3.1.1.7.1.4.   The User Shopping List shall allow users to interact

with the main menu located in the bottom of the

screen.

3.1.1.7.1.5.   The User Shopping List shall allow users the ability

to scroll up/down dependent on the number of

shopping list items present on the screen.

3.1.1.7.1.6.   The User Shopping List screen shall be responsive

and organized based on the device used.

3.1.1.7.1.7.   The User Shopping List shall allow the increment or

decrement of quantity of any specific shopping list

item by clicking/tapping on the up or down icons

located within each shopping list item.

3.1.1.7.1.8.   The User Shopping List shall display a button titled

'Container Recommendation' in the end of a Store

section if there is more than one product for that

specific store.

3.1.1.7.1.9.   The User Shopping List shall have functionality for the 'Container Recommendation' button which directs the user to the customized container recommendation screen.

3.1.1.8.   Advocacy and Petition Sites Screen (*O: Pathan, M1: Hull*)

   3.1.1.8.1.   The Advocacy and Petition Sites screen shall meet the following requirements:

      3.1.1.8.1.1.   The Advocacy and Petition Sites screen shall display a button for each Petition URL from the database.

      3.1.1.8.1.2.   The Advocacy and Petition Sites screen shall display a button for each Advocacy URL from the database.

      3.1.1.8.1.3.   The Advocacy and Petition Sites screen shall be organized by displaying Advocacy buttons first and then Petitions buttons.

      3.1.1.8.1.4.   The Advocacy and Petition Sites screen shall be responsive and shall adjust to the user's device.

      3.1.1.8.1.5.   The Advocacy and Petition Sites screen shall allow user interaction with each button displayed by either allowing a click or tap on button from the user device.

3.1.1.8.1.6.   The Advocacy and Petition Sites screen shall open a new browser window when a site button is clicked/tapped on.

3.1.1.9.   Container Recommendation Screen (*O: Rios, M1: Hull*)

    3.1.1.9.1.   The container recommendation screen shall meet the following requirements:

        3.1.1.9.1.1.   The container recommendation screen shall display the title "Customized Container Recommendation" at the top of the screen.

        3.1.1.9.1.2.   The container recommendation screen shall display a subheading "For this shopping list, you will need:" directly beneath the page title.

        3.1.1.9.1.3.   The container recommendation screen shall display a table of all the suggested containers for a user's shopping list.

        3.1.1.9.1.4.   Each row in the table described in Requirement 3.1.1.9.1.3 shall display the following information:

            3.1.1.9.1.4.1.   The recommended container for a single product.

            3.1.1.9.1.4.2.   The product name.

            3.1.1.9.1.4.3.   The product amount.

            3.1.1.9.1.4.4.   The type and quantity of container recommended.

3.1.1.9.1.4.5.   The material of the container.

3.1.1.9.1.4.6.   The volume recommended for the container.

3.1.1.9.1.5.   Beneath the table of recommended containers, a table for the total containers recommended shall be displayed.

3.1.1.9.1.6.   Each entry in the table specified in Requirement 3.1.1.9.1.5 shall describe one container type required for the user's shopping list.

3.1.1.9.1.7.   All required container types shall be included in the table specified in Requirement 3.1.1.9.1.5.

3.1.1.9.1.8.   Each entry in the table specified in Requirement 3.1.1.9.1.5 shall include the following information:

3.1.1.9.1.8.1.   The type and quantity of a recommended container.

3.1.1.9.1.8.2.   The material composition of a recommended container.

3.1.1.9.1.8.3.   The volume of a recommended container.

3.1.1.9.1.9.   The container recommendation screen shall display a button "Back to My Shopping List" underneath the total table specified in Requirement 3.1.1.9.1.5.

3.1.1.9.1.10.   The "Back to My Shopping List" button shall return the user to the Shopping List screen.

3.1.1.9.1.11.   The container recommendation screen shall be designed in a responsive manner such that the content is properly displayed on the user's screen, accounting for orientation and resolution of the screen.

3.1.1.10.   Store Search Screen (*O: Rios, M1: Chang*)

3.1.1.10.1.   The store search screen shall display a full-screen map, leaving space at the bottom for the navigation bar.

3.1.1.10.2.   The store search screen shall display pins in the appropriate location on the map for each nearby store listing.

3.1.1.10.3.   The store search screen shall display the five (5) nearest stores with package-free options.

3.1.1.10.4.   For each store listing, the store search screen shall display the following:

3.1.1.10.4.1.   The store name.

3.1.1.10.4.2.   The store address.

3.1.1.10.4.3.   A details button to open details for the store.

3.1.1.10.5.   The details button for each listing shall open a full page display providing store information as follows:

3.1.1.10.5.1.   The store name and address.

3.1.1.10.5.2.   The store's hours, listed for each day of the week.

3.1.1.10.5.3.   The store's website and phone number.

3.1.1.10.5.4.   A "View Products" button to view the store's

products.

3.1.1.10.6.   The "View Products" button for each store shall redirect the

user to the product listing page with results given for that

specific store.

3.1.1.10.7.   The detailed view for a store shall have a "Go Back" button

to return to the map results.

3.1.1.10.8.   The store search page shall be designed in a responsive

manner such that the content is properly displayed on the

user's screen, accounting for orientation and resolution of

the screen.

3.1.1.11.   Product Search Screen (*O: Rios, M1: Chang*)

3.1.1.11.1.   The product search screen shall display two different

options for product search: "Search by Icons" and "Enter

Product Name".

3.1.1.11.2.   Each of the two options mentioned in Requirement

3.1.1.11.1 shall have helpful text to describe the capabilities

of that search function to the user.

3.1.1.11.3.   Once the "Search by Icons" option is selected, icons of

products representing the corresponding product categories

shall be displayed.

3.1.1.11.4.   Once the "Enter Product Name" option is selected, under

the text "I am looking for", a text field shall be displayed

where the user can enter the name of the product they look

for.

3.1.1.11.5.   A search button with appropriate icon shall be displayed

below the text field mentioned in Requirement 3.1.1.11.4.

The search button shall direct the user to the product listing

page.

3.1.1.11.6.   Once the user searches for products, they shall be displayed

in a list.

3.1.1.11.7.   Every relevant product from nearby stores shall be

displayed on the product listing page.

3.1.1.11.8.   Products shall be listed vertically in an infinitely scrolling

list.

3.1.1.11.8.1.   To ensure performance, products shall be loaded

onto the end of the list in groups of 10 as the user

approaches the end of the list.

3.1.1.11.8.2.   When the user reaches the end of the list, a list

bounce effect shall be played.

3.1.1.11.9.   The product listing shall have a sorting functionality, where

users can sort the products based on distance or price.

3.1.1.11.10.   Each product listing shall consist of the following

information:

3.1.1.11.10.1.   The item title.

3.1.1.11.10.2.   The unit price of the item.

3.1.1.11.10.3.   The store name, city, and state.

3.1.1.11.10.4.   A button to view the recommended container for the

specific product in a pop-up dialog box.

3.1.1.11.10.5.   A button to add the product to the user's shopping

list.

3.1.1.11.11.   The product listing page shall contain a "New Search"

button to redirect the user back to the product search page.

3.1.1.11.12.   The product search screen shall be designed in a responsive

manner such that the content is properly displayed on the

user's screen, accounting for orientation and resolution of

the screen.

3.1.2.   Algorithms

3.1.2.1.   Account Creation (*O: Colombini*)

3.1.2.1.1.   The system shall allow users to create an account. The

following requirements shall be met:

3.1.2.1.1.1.   Registration process: The system shall provide a

registration process for users to create a new

account, which includes collecting basic

information such as name, email and password.

3.1.2.1.1.2.   Validation: The system shall validate users inputs

and ensure that all required fields are completed

before creating a new account.

3.1.2.1.1.3.   Password requirements: The system shall enforce

password requirements to ensure that passwords are

strong and secure, including minimum length,

complexity, and character types.

3.1.2.1.1.4.   User authentication: The system shall authenticate

users during the account creation process to ensure

that only authorized users can create a new account.

3.1.2.1.1.5.   Account confirmation: The system shall provide a

confirmation mechanism to verify the user's email

address and activate the new account.

3.1.2.1.1.6.   Error handling: The system shall handle errors that

may occur during the account creation process, such

as incorrect inputs or server errors.

3.1.2.1.1.7.   User profile: The system shall create a user profile

for each new account, which includes basic

information such as name and email address, as

well as, as optional information such as profile

picture, and location.

3.1.2.1.1.8.   Security: The system shall store account

information securely to prevent unauthorized access

or modification.

3.1.2.2.   Store Search (*O: Chang*)

The system shall allow users to search for stores based on their current location, or based on the zip code that they provided. The system shall display the stores on the interactive map from where the users can get further information about the stores. The following requirements must be met:

3.1.2.2.1.   Location-based search:

    3.1.2.2.1.1.   Based on the user's current location via GPS.

    3.1.2.2.1.2.   Based on the user's supplied zip code.

3.1.2.2.2.   Store display:

    3.1.2.2.2.1.   In an online map, the 5 nearest stores shall be marked with pins.

3.1.2.2.3.   Store information:

    3.1.2.2.3.1.   A store information window shall open once the pin of the store is tapped.

    3.1.2.2.3.2.   The store information window shall contain basic information about the store:

- Store name
- Store address

    3.1.2.2.3.3.   The store information window shall contain a 'Details' button. When tapped, a new page shall open displaying the following store information:

- Store name
- Store address

- Opening hours

- Website

- Telephone number

- 'View Products' button

3.1.2.2.3.4.   The store information window shall close when the user taps on another store's pin on the map.

3.1.2.3.   Product Search (*O: Colombini M1: Maximova*)

The system shall enable users to perform a location-based search for specific package-free products in their vicinity. The system should present the search results in a prompt and efficient manner. The following requirements must be met:

3.1.2.3.1.   Location-based search:

3.1.2.3.1.1.   Based on the user's current location via GPS (US only).

3.1.2.3.1.2.   Based on the user's supplied zip code.

3.1.2.3.1.3.   Based on the user's supplied address.

3.1.2.3.1.4.   Based on the user's supplied City and State.

3.1.2.3.2.   Search filters: Users shall be able to filter their search results according to:

3.1.2.3.2.1.   Specific product categories.

3.1.2.3.2.2.   Store names.

3.1.2.3.2.3.   Limit the area of the search results to a specific mileage.

3.1.2.3.3.   Product Availability: The system shall retrieve real-time

information on the inventory of package-free products at

each store and display the availability of each item.

3.1.2.4.   Shopping List (*O: Colombini, M1: Chang*)

The system shall allow the user to create a shopping list to keep

track of the items they want to buy. The following requirements

shall be met:

3.1.2.4.1.   List creation: The system shall provide a feature for the

user to create a new shopping list.

3.1.2.4.2.   List modification: The system shall allow the user to add,

remove, or update items.

3.1.2.4.3.   List retrieval: The system shall allow the user to retrieve

their shopping list at any time.

3.1.2.4.4.   List deletion: The system shall allow the user to delete a

shopping list once it is no longer needed.

3.1.2.5.   Container Recommendation (*O: Colombini, M1: Chang*)

Provide the capability to display types of containers needed based

on the user's shopping list in the following manner:

3.1.2.5.1.   The quantities of containers needed, both for specific

products, and for the shopping (overall).

3.1.2.5.2.   The types of containers needed, both for specific products,

and for the shopping (overall).

3.1.2.5.3.   The volume size of each container needed.

3.1.2.6.   Reward.Me (*O: Chang*)

The system shall allow users to collect, view, and redeem reward points. The following requirements shall be met:

3.1.2.6.1.   Point balance: The system shall provide a feature for the user to view the amount of points that they currently have.

3.1.2.6.2.   Point collection: The system shall allow the user to receive reward points from the stores for actions and/or behaviors specified by the store.

3.1.2.6.3.   Point redemption: The system shall allow the user to redeem their points for benefits specified by the stores.

3.1.2.7.   Store Rating (*O:Chang, M1:Colombini*)

3.1.2.7.1.   Store selection: The system shall enable the user to select a store to rate from a list of available stores.

3.1.2.7.2.   Rating System: The system shall offer a rating system that allows the user to rate the store on a numerical scale from 1 to 5, inclusive.

3.1.2.7.3.   Criteria: The system shall provide a set of criteria for rating the store, such as quality of service, cleanliness, product variety, and price.

3.1.2.7.4.   Rating submission: The system shall allow the user to submit their rating for the selected store.

3.1.2.7.5.   Average rating: The system shall calculate and display the

average rating for each store based on all the submitted

ratings.

3.1.2.7.6.   Review management: The system shall enable the store

owners to view and respond to the feedback provided by

the users.

3.1.2.7.7.   Security: The system shall store rating data securely to

prevent unauthorized access or modification.

3.1.2.8.   Suggested Edits (*O:Chang, M1:Maximova*)

The system shall allow users to report new or closed stores, new or

removed products, and price changes.

3.1.2.8.1.   The system shall provide a form where users can submit

information regarding the following:

- New stores

- Closed stores

- Stores temporarily closed

- New products

- Products that have been removed from the store's

offerings

- Price changes

After validating the inquiry, the developer team adjusts the

information in the application.

3.1.2.8.2.   The form page shall allow the user to submit product

information only if the store information is filled in.

3.1.2.8.3.   The form page shall allow the user to submit price

information only if the store and product information is

filled in.

3.1.2.8.4.   The form page shall not allow the user to submit product or

price information if the user reports information regarding a

store that closed.

3.1.2.9.   Product Upload (*O: Chang*)

The system shall allow store owners/employees to enter the

information of products that are available in their store.

3.1.2.9.1.   Store owners/employees shall be able to specify the

following regarding a new product that they would like to

enter:

- Name

- Product ID

- Category

- Price

- Unit

3.1.2.9.2.   Store owners/employees shall be able to edit or delete the

products that they previously entered into the system.

3.1.2.10.   Reward Point Conversion (*O: Chang*)

The system shall allow store owners/employees to enter
information regarding the amount of points that are needed for
certain products or services at the store.

3.1.2.10.1.   Store owners/employees shall be able to specify the
following regarding a new reward point conversion that
they would like to enter:

- Name of product or service

- Reward points needed for the product or service

- Expiry date

3.1.2.10.2.   Store owners/employees shall be able to edit or delete the
reward point conversion entries that they previously added.

3.1.2.11.   Profile

The system shall allow users to view and edit their personal
information to enter information, upload a photo, and make
changes to their profile and notification settings.

3.1.2.11.1.   Users shall be able to view the name which they registered
for the application.

3.1.2.11.2.   Users shall be able to upload a photo in order to use it as
their profile picture.

3.1.2.11.3.   Shoppers shall be able to view their saved stores, to share
the application with friends, and to make modifications to
their profile settings.

3.1.2.11.4.   Store owners/employees shall be able to edit their store

information like address, opening hours, and contact

information.

3.1.2.11.5.   Store owners/employees shall be able to make changes to

their profile settings, notification settings, and to the roles

and permission that are specified in the app.

3.2.   Performance Requirements

3.2.1.   Performance (*O: Maximova, M1: Pathan*)

Refill.Me landing page shall support 3000 users per hour and must provide

3 seconds or less response time in desktop or mobile, including the

rendering of text, images, data grids. Additional settings:

- It shall allow notifications from other apps to appear on top of the

Refill.Me app.

- During the use of the applications, no shutting down, system

overheating, CPU throttling shall happen.

3.2.2.   Scalability (*O: Maximova*)

Refill.Me application shall be scalable to support 1000 while maintaining

the optimal performance.

3.2.3.   Usability & Compatibility (*O: Maximova*)

Application shall keep users informed about new store listings, updated

store hours, new or seasonal items through appropriate feedback within 24

- 48 hours time.

A notification message shall inform users if the device is not compatible

for the app such as: OS to the disk space.

Application is not guaranteed to work properly if the device is older than

the supported operating systems (iOS: shall support Mojave and up;

Android: shall support pie and up; Windows: shall support 7 and up)

3.2.4. Localization (*O: Maximova, M1: Hull*)

The application shall be available for users who reside in the United

States; outside the US users won't be able to perform Store Searches (US

territories won't be available in version 1.0 release).

3.2.5. Maintainability (*O: Maximova*)

The application shall be available to users at all times unless a scheduled

maintenance is in place.

3.2.6. Availability (*O: Maximova*)

Users shall be able to access and use the application at all times and with

reliable access; preserver the access control and disclosure restrictions on

information.

Administrators shall have the right to block the user if the user violates the

integrity and/or professionalism of the application.

3.3.   Assumptions and Constraints (O: *Maximova, M1: Hull*)

The application shall require an internet connection for an accurate application'

results retrieval: store search, product search, container recommendations, etc.

Additionally:

- No maintenance updates shall occur during the weekdays.

- Users shall have a stable network connection for a delay-free experience.

- The application shall be accessible only to fifty (50) U.S. states including Washington D.C.; no U.S. territories at this time.

- Only United States official holidays shall be recognized by the application.

- Items presented by Refill.Me shall focus primarily on high demand produce.

- It is recommended to use a mobile device for the shopper-experience and a tablet for the store owner-experience.

- The application is not guaranteed to work properly if the device is older than the supported operating systems (iOS: shall support Mojave and up; Android: shall support pie and up; Windows: shall support 7 and up).

- The application's databases and information shall be set in EST time.

- To browse the application, the user is required to create an account with the following restrictions; password using the standard restriction policy: minimum length, at least one lowercase and uppercase letters, at least one number and special characters as well as cannot be the same as the last two (2) passwords.

- To browse the application, users are required to create an account with a real-time email which shall have both valid prefix and domain names.

3.4.   Non-Functional Requirements

3.4.1.   Database (*O: Hull*)

The application shall be built on MySQL Workbench as a MySQL

database hosted on ODU's virtual machine with a Docker container. The

database shall contain information about users, stores, products, rewards,

and containers.

3.4.1.1.   User Account Information (*O: Hull*)

The database shall store the following information for users:

- User ID

- Last name

- First name

- Email address

- Password

- If user is a store owner

- Date joined

- If user is active

- Zip code

The user is identified by a user ID.

3.4.1.2.   Store Information (*O: Hull*)

The database shall store the following information for stores:

- Store ID

- Store type ID

- Owner ID

- Store name

- Store status

- Street number

- Street name

- City

- State

- Zip Code

- Country

- Website

- Email address

- Date joined

- Store rating

The store ID shall be the identifier for the store. Each store shall be

linked to a user account who is a store owner.

3.4.1.3.   Product Information (*O: Hull*)

The database shall store the following information about products:

- Product ID

- Store ID

- Category ID

- Product type ID

- Product name

- Product specification

- Unit price

- Unit

The Product ID shall be the identifier for the product. Each product

shall be linked to a store.

3.4.1.4.   Reward Information (*O: Hull*)

The database shall store the following information about rewards:

- Conversion ID

- Store ID

- Number of reward points

- Type of reward

- Description

- Quantity

- Unit

- Expiration Date

The Conversion ID shall be the identifier for the reward. Each

reward shall be linked to a store.

3.4.1.5.   Container Information (*O: Hull*)

The database shall store the following information about

containers:

- Container type ID

- Container type

- Materials

- Volume

- Unit

The Container Type ID shall be the identifier for the container.

3.4.1.6.   Database Conversion (*O: Maximova)*

The database shall deliver information that shall be converted from javascript to a python based language.

3.4.2.   Security (*O: Hull, M1: Maximova*)

The application shall implement good cybersecurity practices to prevent unauthorized access to user information. This shall be done by:

3.4.2.1.   Requiring a password of a certain length and an email address for a user to access their account.

3.4.2.2.   Encrypting passwords.

3.4.2.3.   Database encryption.

3.4.2.4.   Network and data security.

3.4.2.5.   Data validation and sanitization.

3.4.3.   Availability (*O: Chang, M1: Hull*)

3.4.3.1.   Store search availability (*O: Chang, M1: Hull*)

- Shoppers and store owners/employees shall be able to perform store searches 24 hours a day, 7 days a week.

- The prototype shall be able to complete at least 90% of its store searches without error.

3.4.3.2.   Product search availability (*O: Chang, M1: Hull*)

- Shoppers and store owners/employees shall be able to perform product searches 24 hours a day, 7 days a week.

- The prototype shall be able to complete at least 90% of its product searches without error.

3.4.3.3.   Product addition availability (*O: Chang, M1: Hull*)

- Store owners/employees shall be able to add products 24 hours a day, 7 days a week.

- Store owners/employees shall not experience any delays, difficulties, or restrictions when adding products.
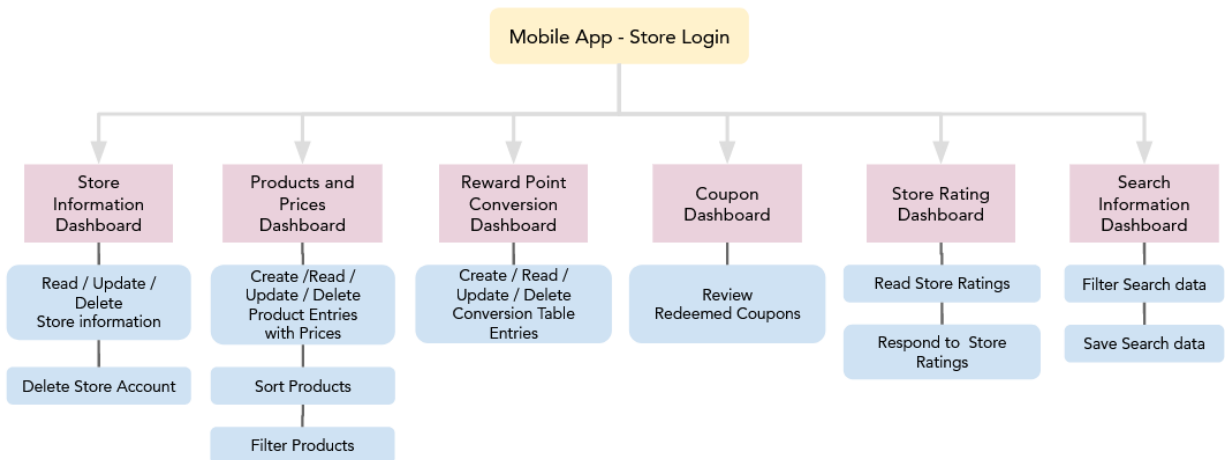
3.4.4.   Reliability (*O: Chang, M1: Hull*)

- The prototype shall have a 90% reliability so that store searches and product searches return accurate information.

- The prototype shall have a 90% reliability so that shoppers and store owners may use Refill.Me's key features without interruption.

Appendix A: Site Maps (O: Hull)

Site Map - Shopper
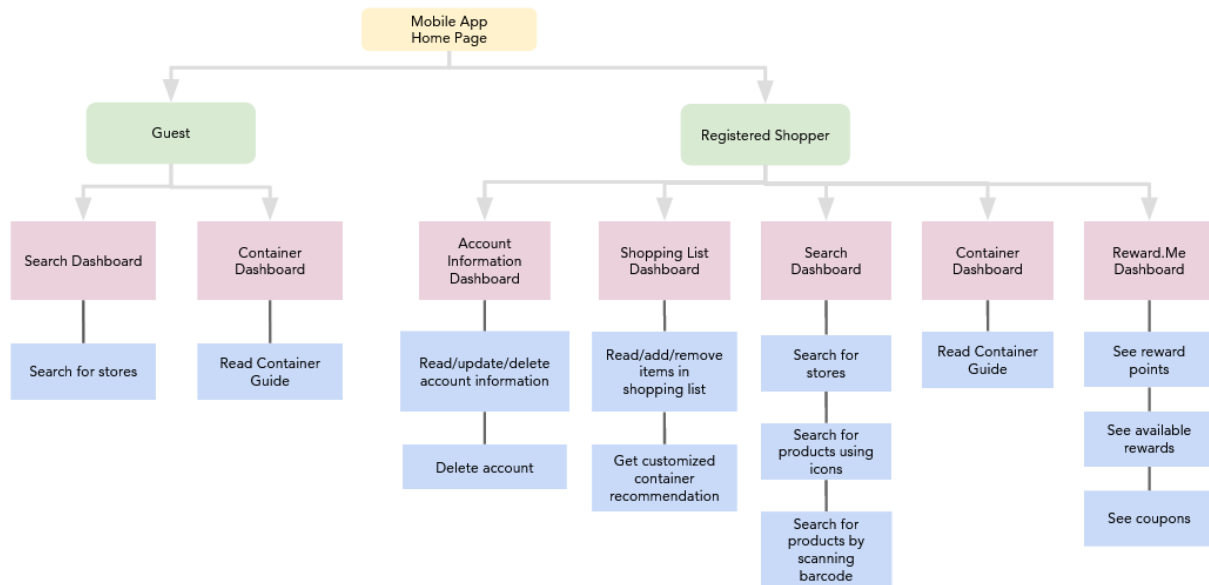
Site Map - Store

Appendix B: Database Schema (O: Hull)