San Jose State University

Spring 2020

CMPE-275

Enterprise Application Development

CartShare

Term Project Report

Advisor: Prof. Charles Zhang

Team - 9

Name	SJSU ID
Kanika Khanna	010471669
Alaukika Diwanji	014547013
Nachiket Trivedi	014544933
Samruddhi Landge	014336816

Content

Git Link: https://github.com/nachiket-trivedi/CartShare
AWS Link : http://3.93.9.166:3000/login

Introduction

The lifestyle of people has changed since the outbreak of COVID-19, which has mandated everyone to stay home and avoid contact with people as much as possible. Inspired by these trying times, we have developed the CartShare application which is a shopping pooling system which has now become an essential in these difficult times of social distancing. The application encourages the users to pool their orders in order to prevent exposure to the mass and hence, staying safe in home. Moreover, there are the added benefits of saving time, cost and fuel, thus being environment friendly!

The heart of the application lies in the pool. The user has the option of being a part of this pool. Whenever anyone places an order online he/she has the option of either picking up the order himself for the pool or get it delivered by one of the pool members. The user will be rewarded credits based on the number of orders he has picked up.

There are two main users in the application:
- Admin
- Pooler

For the poolers, the main feature of the system is the Pool, wherein the pool leader creates a pool and then fellow poolers can join that particular pool. Poolers are the users who place their orders at a particular grocery store. The poolers can opt about their preferred delivery system.

The system also simulates a virtual pickup mechanism where the delivery pooler can pick up the orders for himself or the fellow poolers.

These orders are traceable throughout the cycle. Email notifications for all major updates have been enabled.
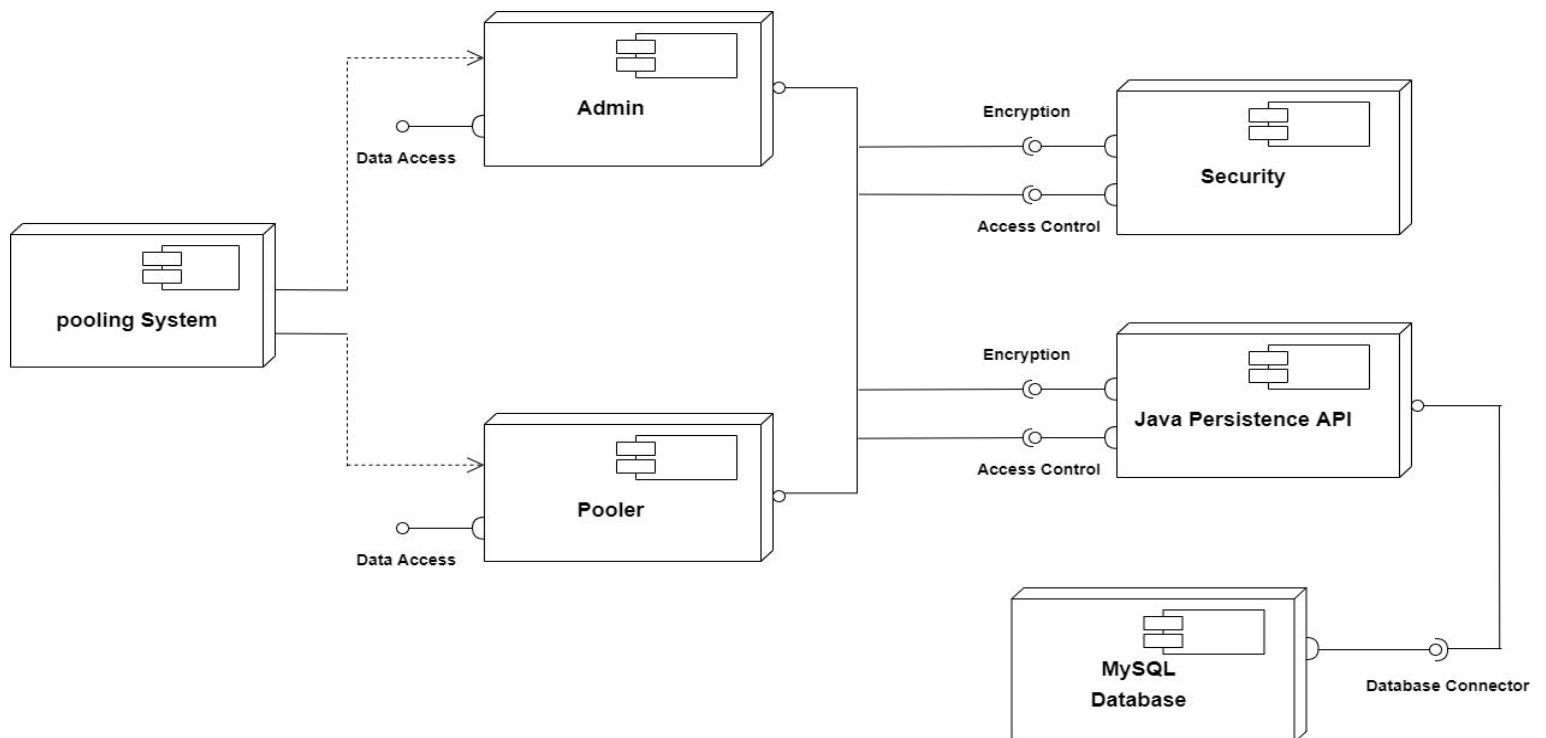
The Admin is the user who can customize the inventory and stores as needed. He manages the two major components - Stores and Products. The Admin can add/ update / delete Stores. He/she can customise the products in each store and edit/ delete them as needed.

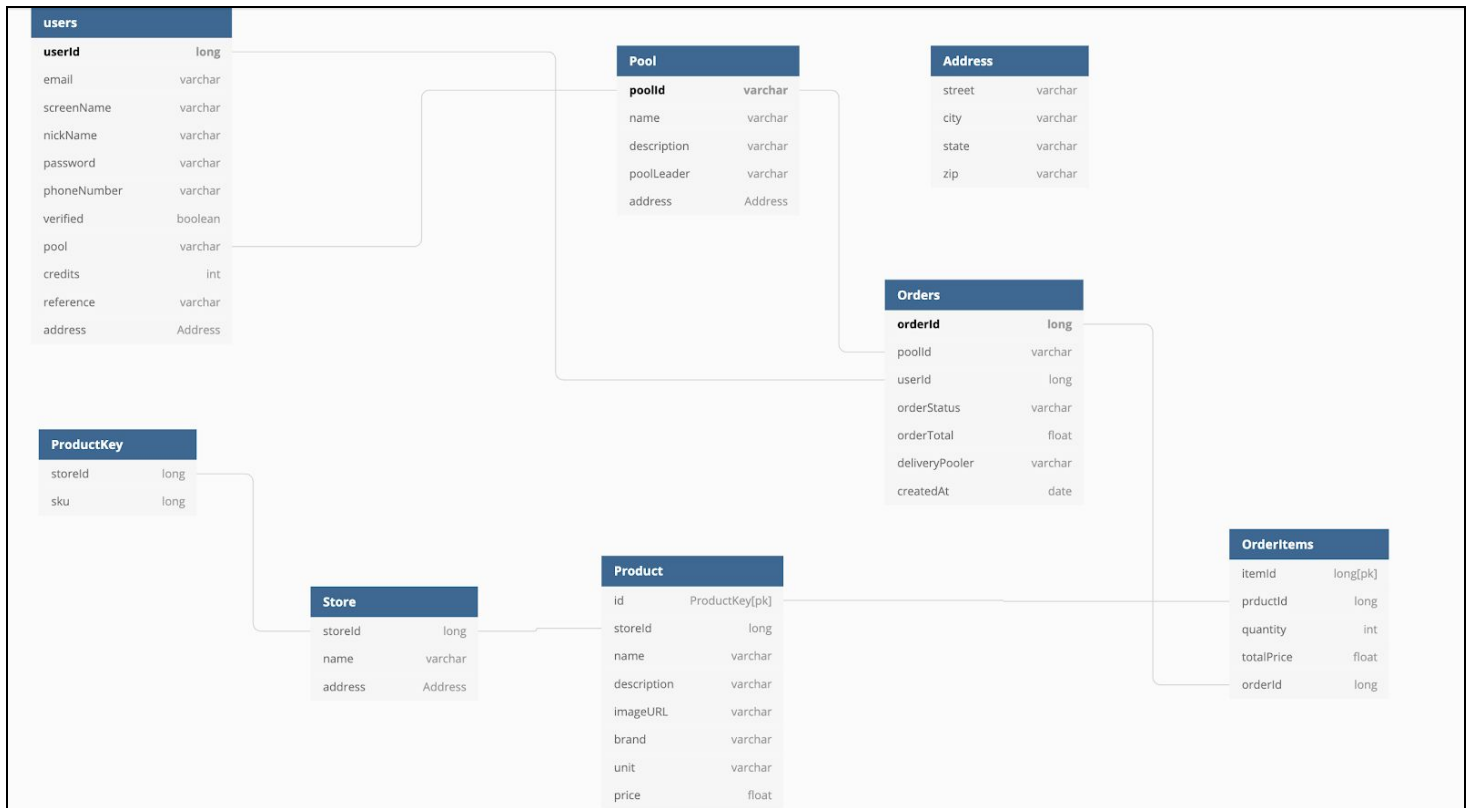# High Level Design and Component Level Design

High Level Design:
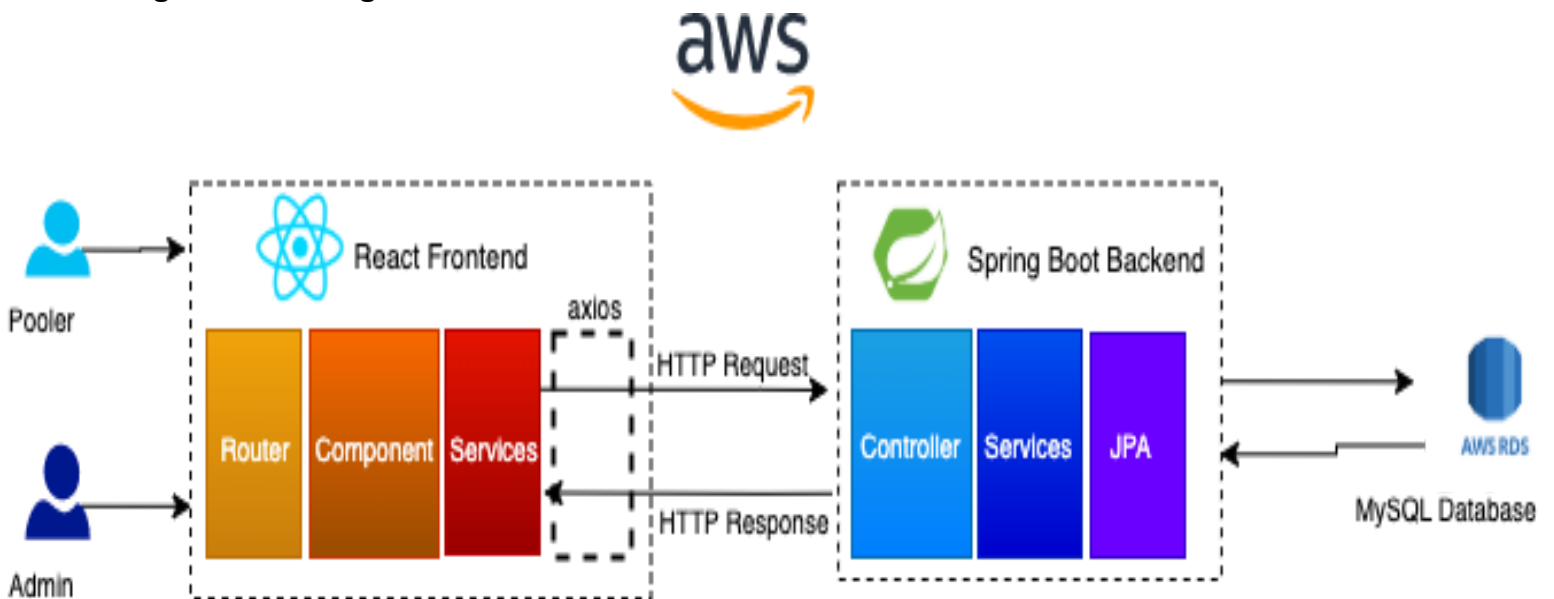
Component - Level Design:

Database Design:

Technology Choices

Backend:
- The programming language used for backend is Java.
- We have used the **Spring Boot** framework for developing the REST APIs.
- As a relational DBMS, we used **Amazon RDS** as our database system.
- For the Database Interaction, we used **Java Persistence API** (JPA).

Frontend:
- The programming language used for frontend is Javascript
- We have used the **ReactJS** Framework for developing UI components
- The frontend makes Axios calls to the backend. The Request and Response are in **JSON** form.
- Google Authentication using **Firebase** is enabled.

Deployment:
- The application is hosted on **Amazon AWS EC2** instance.

Source Code Management:
- We have used **GitHub** for Source Code Management

Description of Features and Screenshots

In order to access the application, the users need to register with the system. This can be done in two ways,

1.) Through System Registration
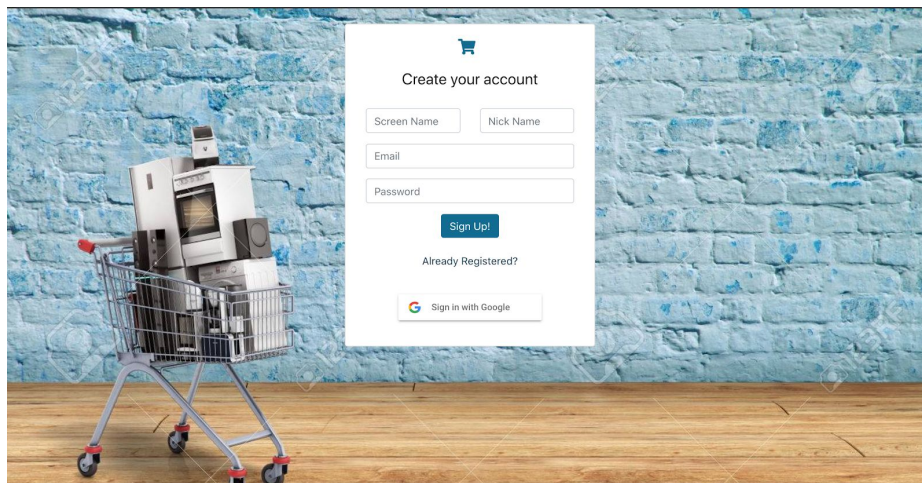
2.) Through Google Signup
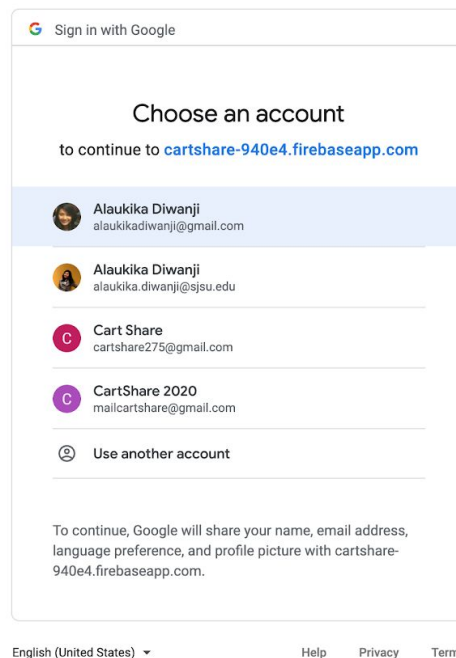
After registration, there is a verification mail sent out to the user. The users cannot login or avail any functionality without verifying their account.
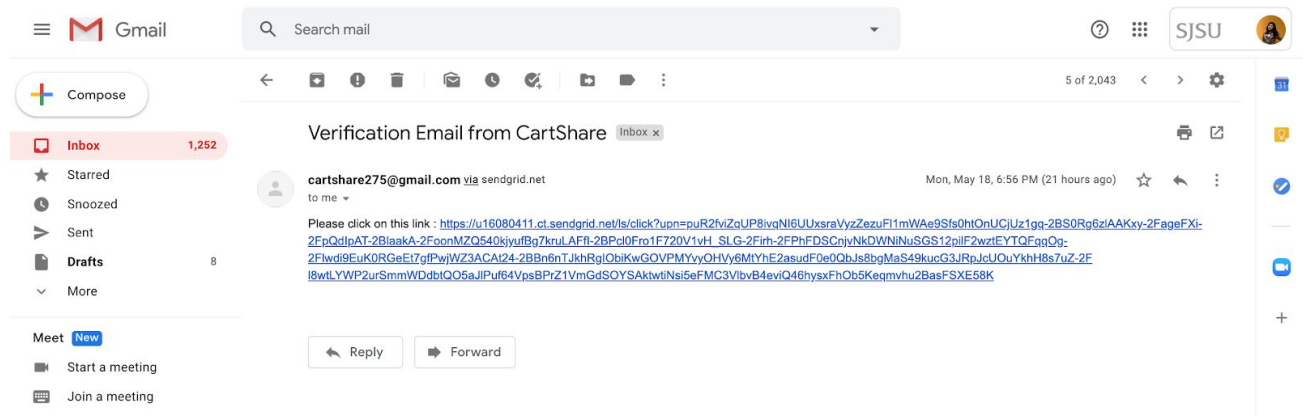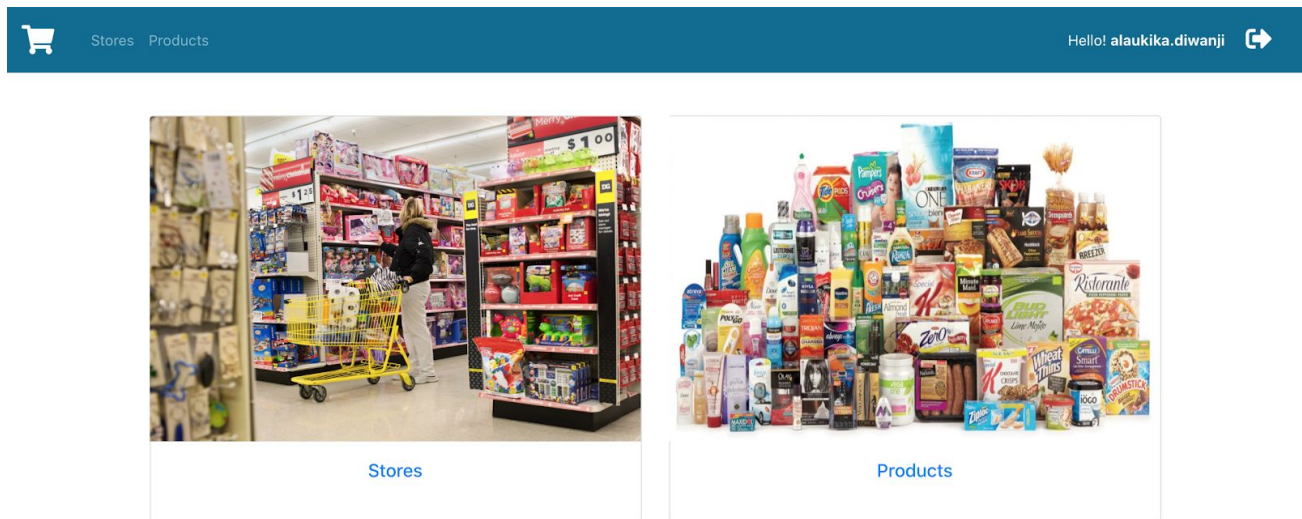

There are two main users for the application :

   1.) Admin
   2.) Pooler

The user can login through the system or use Google authentication.
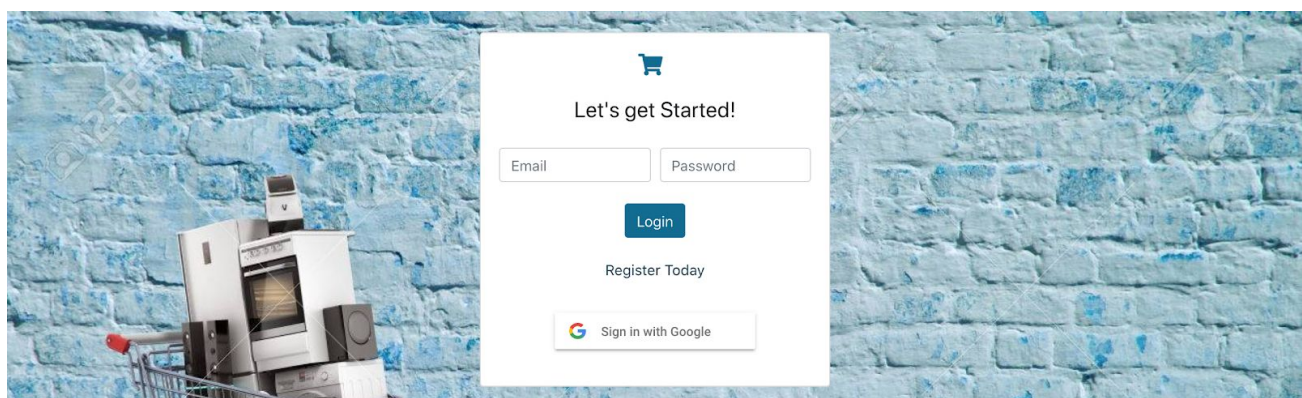
Admin

Any user with the email domain as 'sjsu.edu' is assigned the role of 'Admin' There are two main modules for the Admin:

Stores

The Admin is responsible for managing all the tasks pertaining to maintaining the stores in the system.

● Add Stores : The Admin can add stores. The Store name needs to be unique in the system.

● View Stores : The Admin can view all the stores that have been added.

Stores List

ID	Name	Address	City	State	Zipcode	Action
13	Target	Alameda Road	San Jose	CA	95126	✏ 🗑
15	Patel Brothers	Indian Store	San Jose	CA	95113	✏ 🗑
16	Lucky	1641 N Capitol Ave	San Jose	CA	95132	✏ 🗑
17	Safeway	1300 W San Carlos St	San Jose	CA	95126	✏ 🗑
18	New India Bazar	Indian Store, Near Patel Brothers	San Jose	CA	95113	✏ 🗑
21	Walmart	El Camino Royal	San Jose	CA	95113	✏ 🗑
22	Dollar Tree	Down Town	San Jose	CA	95112	✏ 🗑

- Edit Stores : The Admin can edit the details of the stores.
- Delete Stores : The Admin can delete the stores. The system ensures that there are no unfulfilled orders in the system for that particular store.

Stores List

Name	Address	City	State	Zipcode	Acti
Target	Alameda Road	San Jose	CA	95126	💾 ✕

Products

The Admin is responsible for managing all the tasks pertaining to maintaining the products in the system. He/she can assign these products to the stores.

- Add Products : The Admin can add Products to the system.

Stores Products

Hello! alaukika.diwanji

Back

Add Product

Product Name

Description

Brand

img

Unit

Price

Store Name   Search

SKU

Add Clear

- View Products : The Admin can view the Products added to the system. Moreover, he/she can search the products through storeID, sku or product name.

- Update Products : The Admin can update the products in the system.
- Delete Products : The Admin can delete the Products in the system. The systems ensures that there are no unfulfilled orders for that product.

Pooler

The functionalities of the Pooler as as follows:

Browse All Stores

- The user, after logging in, views all the stores in their home page. They can browse through all the registered stores and view the store description and address. They can visit whichever store they want to, and browse their products.
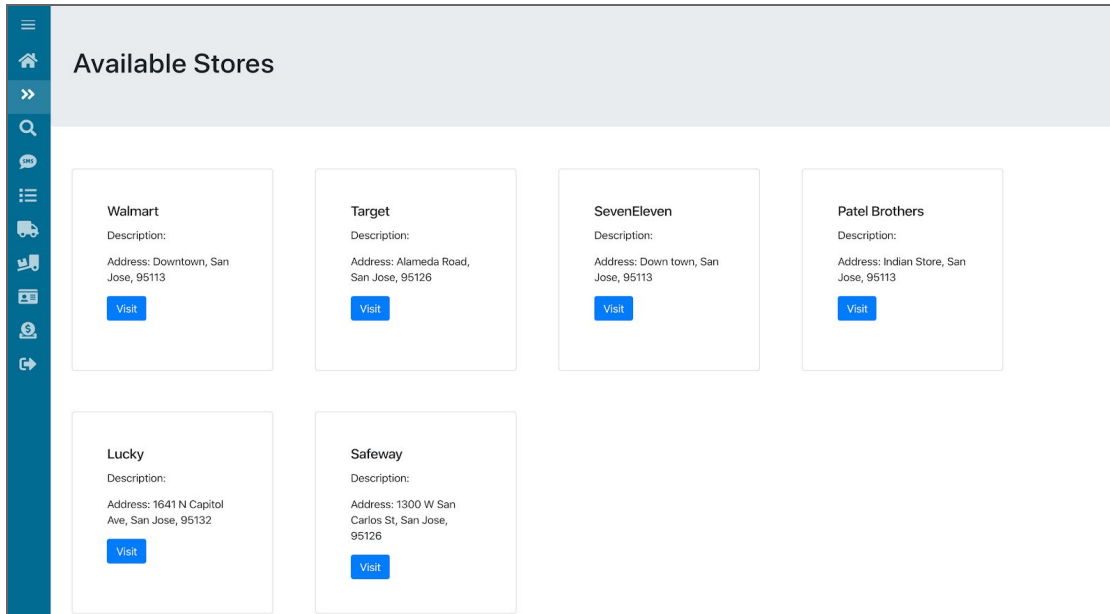
The Store

- When the user clicks the 'Visit' button, she is redirected to the store's page. Here the user can view all the products the store is offering and add the same to their cart.
- However, a user can only add a product if she is assigned to a pool. That is, a non-pooler can only view the products of the store but cannot add the products to the cart.
- The user can view the product details like description, unit, price, along with a pretty image for the same.
- She'll be provided with buttons to add or subtract quantities of the selected product, and an 'Add to Cart' button to do the needful.
- Furthermore, the user can also search the specific product she desires from the whole pool of products, and the catalog will be filtered accordingly.

Pool

The Pooler can view the pool he/she is a part of

The user can browse for pools and ask to join any of the pools. In order to be a part of the Pool, the user needs to specify a reference. Only after the reference pooler approves the user, the User can avail the benefits of the Pool.

Browse Pools Here

🔍

| San Jose | Search |

NearSJSU | Enter reference's ScreenName. Can also be the Pool Leader. | Join Pool

1 Washington Square San Jose California 95192

Evergreen | Enter reference's ScreenName. Can also be the Pool Leader. | Join Pool

San Fernando, san Carlos San Jose 95112 95132

The Pooler can message fellow Pool members

Message Poolers

| kaniks0717 | ▾ | Filter | Clear |

Your Message:

I have picked up your Order! :)

Send Message

If the Pooler is not part of any pool, then he/she can create a new Pool.

You are not member of any Pool yet!

Create your own Pool.

Create

Add your new pool details.

Pool ID
Pool5

Pool Name
SpartansPool

Pool Description
Pool for spartans

Pool Street
San Fernando

Pool City
San Jose

Pool State
California

Pool Zip
95112

Create a new Pool

Shopping Cart

- After selecting her products, and adding the same to the cart, the user(pooler) can view her shopping cart for verifying and eventually placing the order.
- The user can view the products and modify the same but adding/subtracting the quantities, as well as deleting the product altogether.
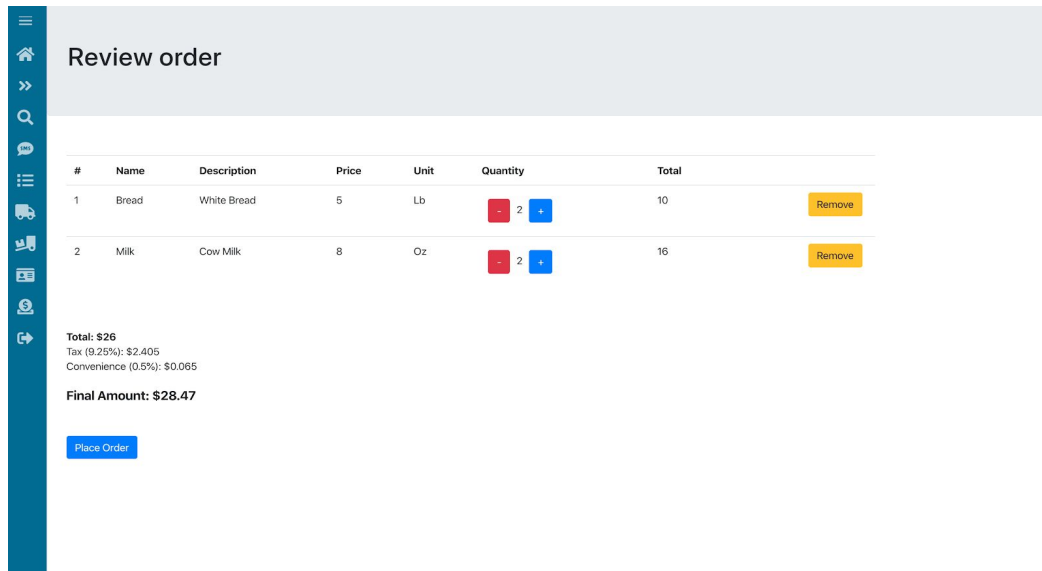
- The user, after finalizing, can place their order, given they've already entered their address beforehand.
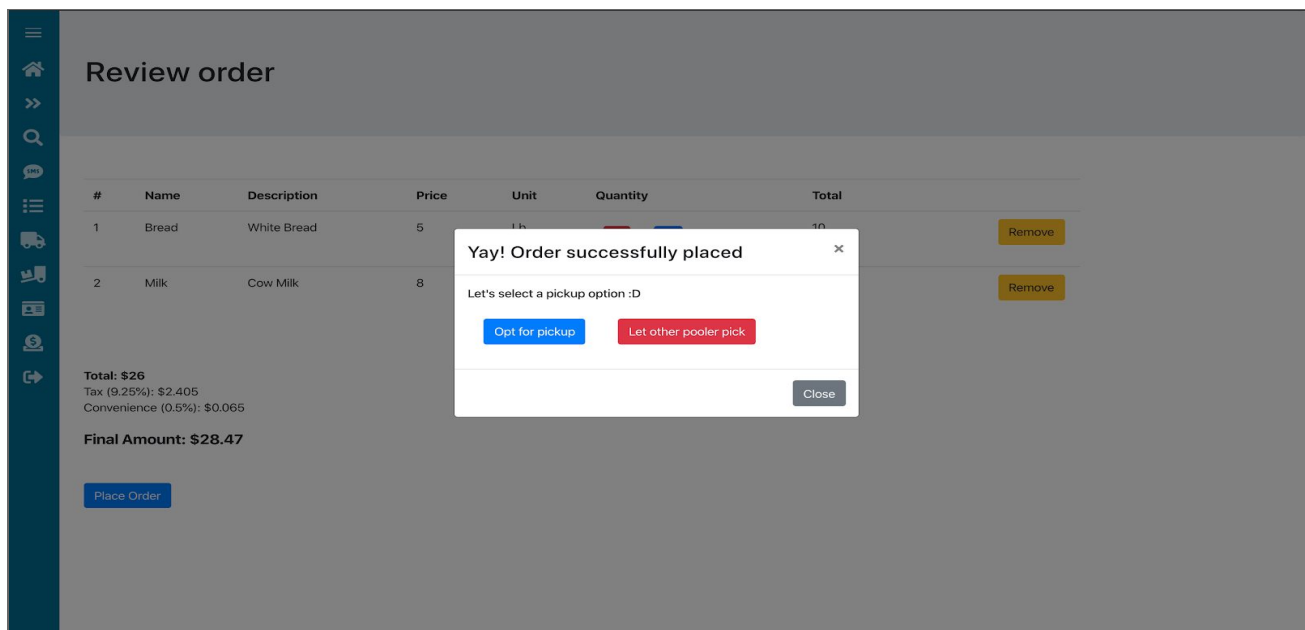
Contribution Credit Reminder:

Review order

#	Name	Description		
1	Cocoa powder	cocoa powder		Remove

Reminder

OK

Your Contribution Credits: -5

Total: $12
Tax (9.25%): $1.11
Convenience (0.5%): $0.03

Final Amount: $13.14

Place Order

Confirmation Popup:

Review order

#	Name	Description		
1	Cocoa powder	cocoa powder		Remove

!

You will lose one Contribution Credit point if you agree to continue

OK

Total: $12
Tax (9.25%): $1.11
Convenience (0.5%): $0.03

Final Amount: $13.14

Place Order
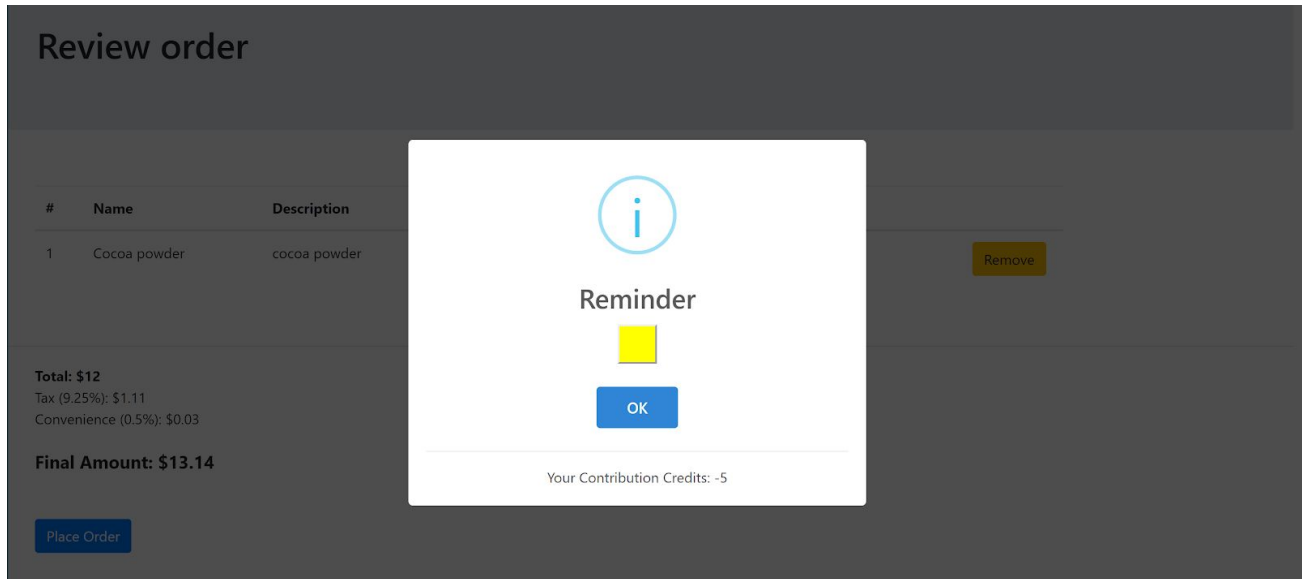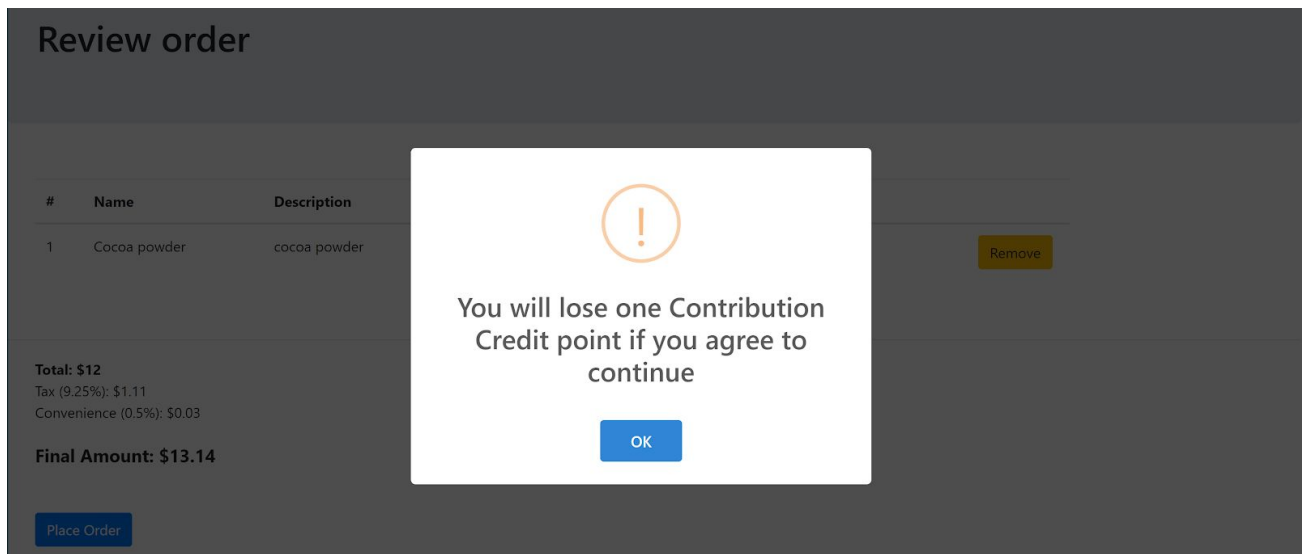
If the pooler chooses the option of "Self pickup", he will be shown all the available pickups of the fellow poolers.

Fellow Poolers' Available Pickup Page:

Orders Available For Pickup

How many orders are you willing to pickup for your fellow poolers?

[1] [Submit]

[Skip this step and Go to My Orders]

Order

Product Name: Cocoa powder

Product Brand: Hersheys

Product Description: cocoa powder

Product Price: 6.0

Product Quantity: 4 pc

Total Price: 24.0

Product Name: Hangers

Product Brand: Hangers

Product Description: Hangers

Product Price: 4.0

Product Quantity: 4 dozen

Total Price: 16.0

Invalid Entry:

Orders Available For Pickup

How many orders are you willing to pickup for your fellow poolers?

[11] [Submit]

[Skip this step and Go to My Orders]

Order

Product Name: Cocoa powder

Product Brand: Hersheys

Product Description: cocoa powder

Product Price: 6.0

Product Quantity: 4 pc

Total Price: 24.0

Product Name: Hangers

Please Enter a number from 1 to 10

Invalid Order Number

[OK]

Email Updates Sent:

The following email is sent to the fellow pooler whose order is chosen by the delivery pooler.

Your CartShare Orders Will be delivered by your fellow pooler! Inbox ×

mailcartshare@gmail.com via sendgrid.net
to me ▾

Your order at Store Safeway will be picked by your fellow pooler.

The following email is sent containing order details (excluding buyer information) to the delivery pooler.

mailcartshare@gmail.com via sendgrid.net
to me ▾

ORDER
Order Total: 13.14

Product Name: Cocoa powder
Product Brand: Hersheys
Product Description: cocoa powder
Product Price: 6.0
Product Quantity: 2
Total Price (Qty * Product Price): 12.0

ORDER
Order Total: 16.425

Product Name: Muffins
Product Brand: Walmart
Product Description: Muffins
Product Price: 5.0
Product Quantity: 3
Total Price (Qty * Product Price): 15.0

All Orders

- The user can also view all his past(and current) orders in a different 'My Orders' page.
- Here she can view all the order specific details, the constituted products as well as the order status.
- If the order status is 'Delivered', a button called 'Report' gets active, rendering the user to report the scenario if she actually has not received the order despite the status.
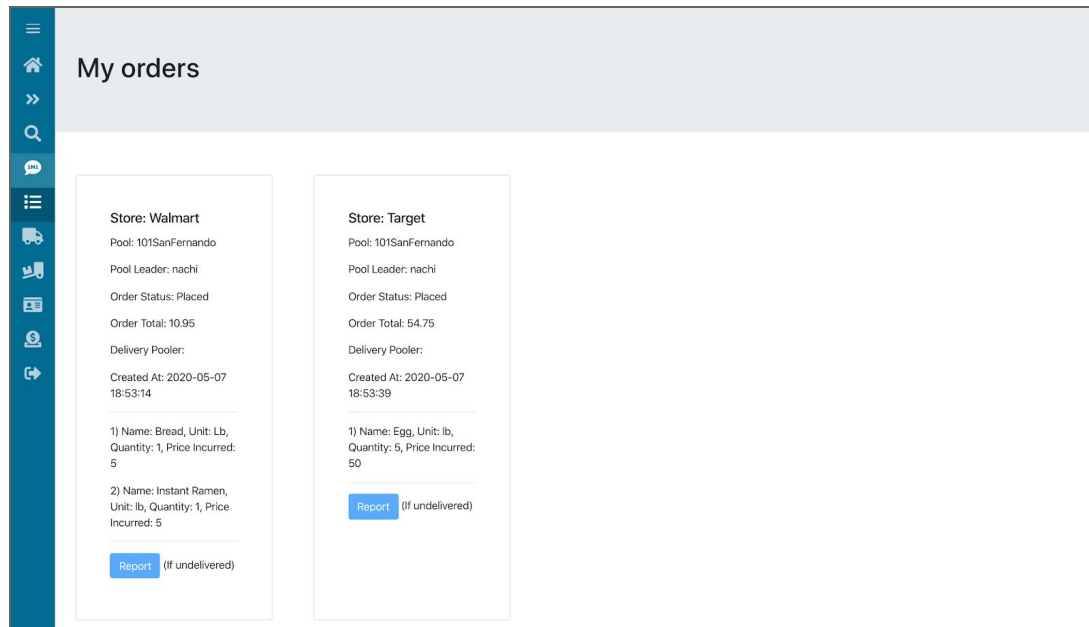
Testing Plan and Results

- We used Apache JMeter to load test our hosted application
- We tested the /login api on our deployed server for 1000 user threads keeping a loop count of 10, and got throughputs and deviation as shown below:
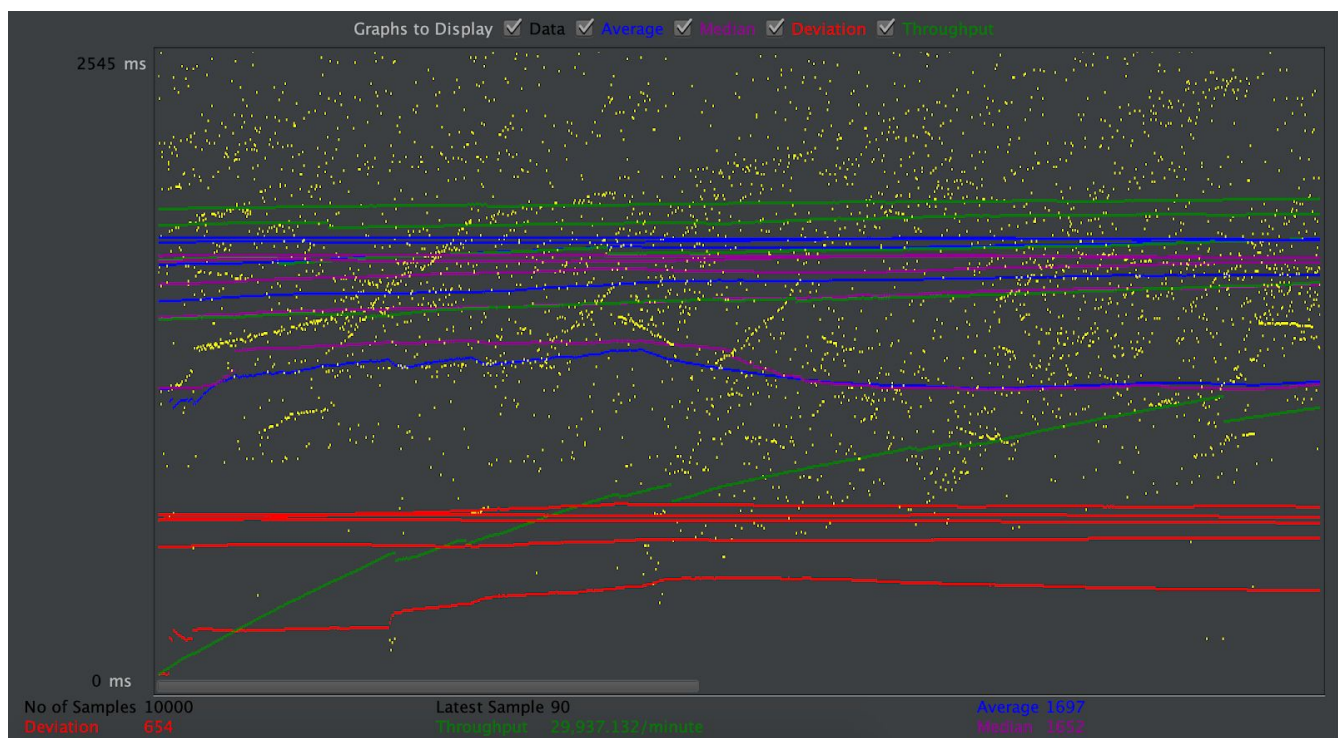
- Testing for /getAllStores which fetches all the stores registered on the application. The throughput, deviation and other metrics displayed below:

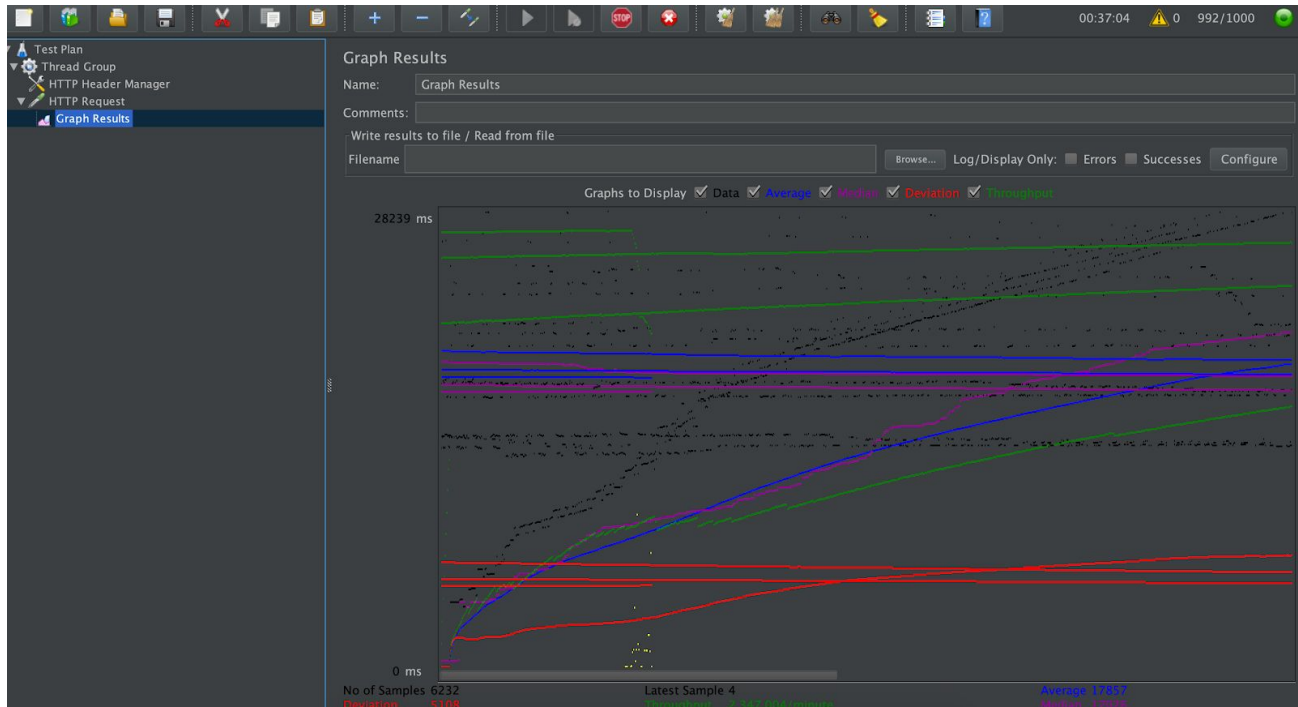# Lessons Learned and Possible Future Work:

CartShare application has been an excellent platform to leverage our knowledge of Web development using ReactJS and Spring Boot. It has honed our programming skills and gave us a better sense of enterprise level application development. Through this application development we have undergone the entire software development lifecycle and learnt the values like teamwork, collaboration and coordination.

We can future extend this application in terms of building a mobile application for ease of access and portability. This will smoothen the process of order delivery and pickup. Moreover, we can also enable the SMS alerts for users and real-time tracking of order using GPS when the Pooler is out for delivery. Moreover, we can also also include a ShopKeeper persona where the Manager of the store can manage his respective stores and also manage the inventory of products, thus making everything online. This will also allow the out-of-stock option. Moreover, we can also enrich the shopping experience by giving the option of substituting a product which is out-of-stock.