Software Requirements Specification

for

SuperPrice - Price Matching and Delivery Application >

Version 1.0 approved

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

SuperPrice is a price matching and delivery application, which will help users to compare the prices of products in local stores. In this SRS document, the following will be discussed: functional and non-functional requirements, use cases, system architecture, user interface design, assumptions and constraints, dependencies, testing and acceptance criteria.

1.2 Document Conventions

Bold and underline - headings

1.3 Intended Audience and Reading Suggestions

This document is designed to guide developers, project managers, and testers while developing, managing, and testing the application.

1.4 Product Scope

The focus of this SuperPrice project is the development of an easy-to-use price matching and delivery application. The Super Price app will show you the best prices of items from different stores and supermarkets in your area. The app will allow you to shop easily, save time and money while offering a variety of delivery options. Realtime price drop and special offer alerts will also be provided by the app. To make it more reliable, the app will be based on user reviews and ratings. At the end of the day, SuperPrice's goal is to make shopping easier for consumers and local businesses alike.

1.5 References

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. Provide enough information so that the reader could access a copy of each reference, including title, author, version number, date, and source or location.>

2. Overall Description

2.1 Product Perspective

<Describe the context and origin of the product being specified in this SRS. For example, state whether this product is a follow-on member of a product family, a replacement for certain existing systems, or a new, self-contained product. If the SRS defines a component of a larger system,</p>

relate the requirements of the larger system to the functionality of this software and identify interfaces between the two. A simple diagram that shows the major components of the overall system, subsystem interconnections, and external interfaces can be helpful.>

2.2 Product Functions / Functional Requirements

• Product Search and Categorization:

- Allow users to search for specific products or browse through different categories.
- Provide a smooth and hassle-free shopping experience.

• Price Comparison:

- Enable users to search for products and compare prices across various local supermarkets.
- Help users identify the store offering the lowest price for their desired items.

• Delivery Organization:

- o Facilitate user-organized deliveries, offering multiple flexible delivery options.
- o Ensure convenient and efficient delivery arrangements.

Notifications and Alerts:

- o Provide timely notifications and alerts about price drops and special offers.
- Ensure users are informed of opportunities to save money.

• User Reviews and Ratings:

- Allow users to leave reviews and ratings for supermarkets and products.
- o Enhance reliability and assist users in making informed purchasing decisions.

• User-Friendly Interface:

- o Prioritize simplicity and ease of use for both novice and experienced shoppers.
- o Ensure an intuitive and accessible application interface.

2.3 User Classes and Characteristics

<Identify the various user classes that you anticipate will use this product. User classes may be differentiated based on frequency of use, subset of product functions used, technical expertise, security or privilege levels, educational level, or experience. Describe the pertinent characteristics of each user class. Certain requirements may pertain only to certain user classes. Distinguish the most important user classes for this product from those who are less important to satisfy.>

2.4 Operating Environment

<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist.>

2.5 Design and Implementation Constraints

<Describe any items or issues that will limit the options available to the developers. These might include: corporate or regulatory policies; hardware limitations (timing requirements, memory requirements); interfaces to other applications; specific technologies, tools, and databases to be used; parallel operations; language requirements; communications protocols; security</p>

considerations; design conventions or programming standards (for example, if the customer's organization will be responsible for maintaining the delivered software).>

2.6 User Documentation

<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>

2.7 Assumptions and Dependencies

<List any assumed factors (as opposed to known facts) that could affect the requirements stated in the SRS. These could include third-party or commercial components that you plan to use, issues around the development or operating environment, or constraints. The project could be affected if these assumptions are incorrect, are not shared, or change. Also identify any dependencies the project has on external factors, such as software components that you intend to reuse from another project, unless they are already documented elsewhere (for example, in the vision and scope document or the project plan).>

3. External Interface Requirements

3.1 User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

3.2 Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

3.3 Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be</p>

implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

3.4 Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

4. Other Nonfunctional Requirements

4.1 Performance Requirements

Response Time:

- The application should respond to user actions, such as product searches and price comparisons, within 2 seconds to ensure a smooth and seamless user experience.
- Rapid response times will prevent user frustration and maintain engagement.

• Search and Comparison Speed:

- The application must be capable of handling simultaneous product searches and price comparisons for multiple users without significant delays.
- Searches and comparisons should complete within 1 second, even during peak usage.

4.2 Security Requirements

User Data Protection:

 User data, including personal details and payment information, must be encrypted both during transmission and storage to prevent unauthorized access.

• Authorization Levels:

 Different user roles (users, administrators) should have appropriate levels of access and permissions to ensure data integrity and prevent unauthorized actions.

• Secure API Integration:

 APIs connecting with supermarket systems and payment gateways should use secure communication protocols (e.g., HTTPS) and require API keys or tokens for access.

4.3 Software Quality Attributes

Usability:

The application's user interface should be intuitive and easy to navigate

Availability:

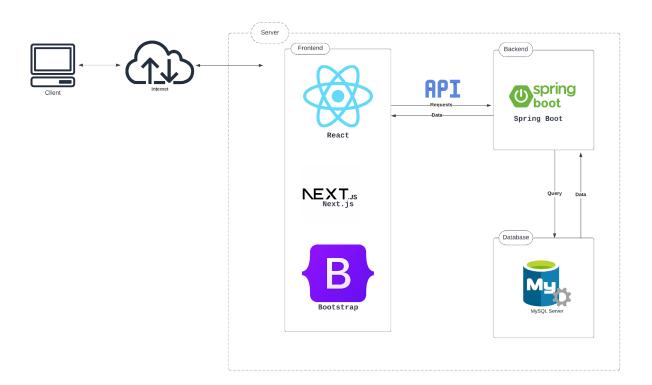
• The application's server infrastructure should provide high availability,

5. Other Requirements

• Database Requirements:

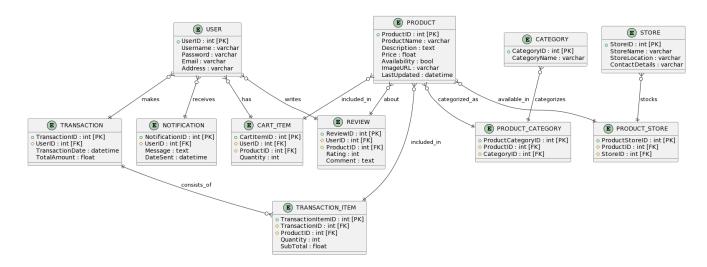
 The application's database should support efficient storage and retrieval of product information, and reviews.

6. System Architecture



- o Client: Represents the user's web browser.
- o **Internet**: Represents the internet through which the user accesses the application.
- o Frontend (Next.js/React): The frontend framework where the user interface is built.
- Backend (Spring Boot): The backend framework handling business logic and data processing.
- MySQL: The database where data is stored.
- API: Represents the various APIs that the frontend might call.

7. Data Model



PRODUCT:

- o Represents individual grocery items.
- Attributes: ProductID, ProductName, Description, Price, Availability, ImageURL, LastUpdated.
- o Relationships:
- Many-to-Many with CATEGORY through PRODUCT_CATEGORY association table.
- o Many-to-Many with STORE through PRODUCT STORE association table.
- o **One-to-Many** with **REVIEW**: A product can have multiple reviews.
- One-to-Many with TRANSACTION_ITEM: A product can be part of multiple transactions.
- One-to-Many with CART ITEM: A product can be added to multiple carts.

CATEGORY:

- Represents different categories of products.
- Attributes: CategoryID, CategoryName.
- o Relationships:
- Many-to-Many with PRODUCT through PRODUCT CATEGORY association table.

STORE:

- Represents supermarkets and stores.
- Attributes: StoreID, StoreName, StoreLocation, ContactDetails.
- Relationships:
- Many-to-Many with PRODUCT through PRODUCT_STORE association table.

USER:

- Represents registered users.
- o Attributes: UserID, Username, Password, Email, Address.
- Relationships:
- One-to-Many with REVIEW: A user can write multiple reviews.
- One-to-Many with TRANSACTION: A user can make multiple transactions.
- One-to-Many with NOTIFICATION: A user can receive multiple notifications.
- One-to-Many with CART_ITEM: A user can have multiple items in their cart.

REVIEW:

- o Represents user reviews and ratings for products.
- o Attributes: ReviewID, UserID, ProductID, Rating, Comment.
- o Relationships:
- Many-to-One with USER: Each review is written by one user.
- Many-to-One with PRODUCT: Each review is about one product.

TRANSACTION:

- o Represents a purchase made by a user.
- o Attributes: TransactionID, UserID, TransactionDate, TotalAmount.
- Relationships:
- One-to-Many with TRANSACTION_ITEM: A transaction can consist of multiple items.
- Many-to-One with USER: Each transaction is made by one user.

TRANSACTION_ITEM:

- o Represents individual items within a transaction.
- o Attributes: TransactionItemID, TransactionID, ProductID, Quantity, SubTotal.
- Relationships:
- Many-to-One with TRANSACTION: Each transaction item is part of one transaction.
- o Many-to-One with PRODUCT: Each transaction item represents one product.

NOTIFICATION:

- Represents notifications sent to users.
- Attributes: NotificationID, UserID, Message, DateSent.
- Relationships:
- Many-to-One with USER: Each notification is received by one user.

CART ITEM:

- o Represents items added to a user's shopping cart.
- o Attributes: CartItemID, UserID, ProductID, Quantity.
- Relationships:
- Many-to-One with USER: Each cart item belongs to one user.
- Many-to-One with PRODUCT: Each cart item represents one product.

PRODUCT CATEGORY (Association Table):

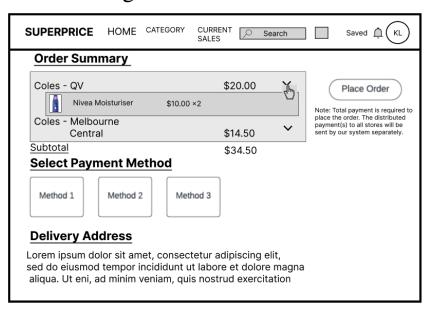
- Resolves the many-to-many relationship between products and categories.
- Attributes: ProductCategoryID, ProductID, CategoryID.

PRODUCT STORE (Association Table):

- o Resolves the many-to-many relationship between products and stores.
- o Attributes: ProductStoreID, ProductID, StoreID.

8. User Interface Design / Wireframes

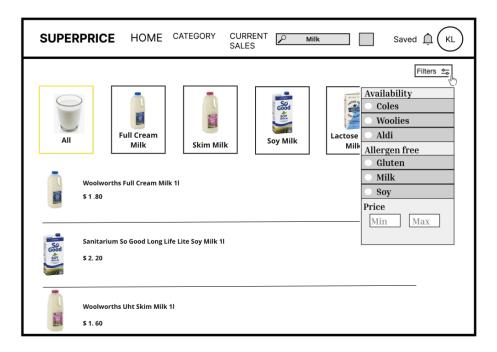
1. Checkout Page



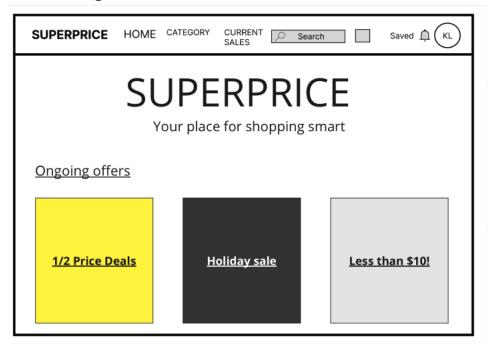
2. Category Hover view



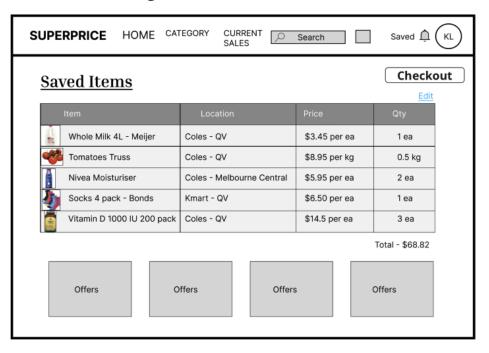
3. Filter View



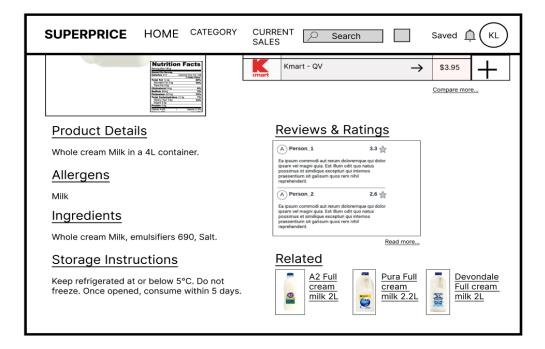
4. Home Page



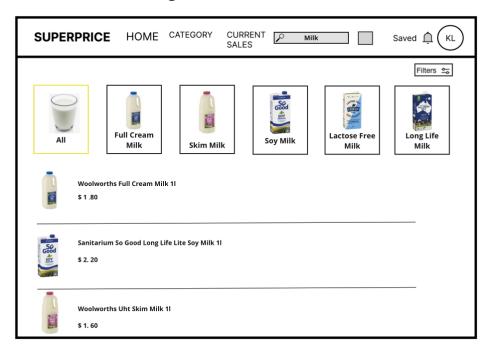
5. Saved Items Page



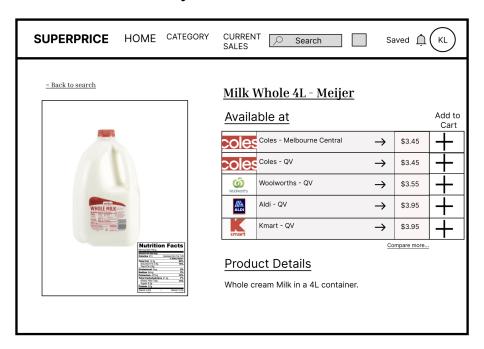
6. Product Details View



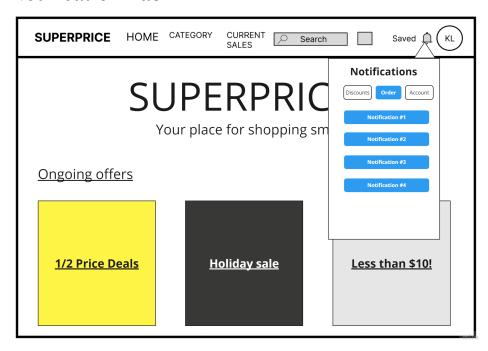
7. Search Results Page



8. Product Availability View



9. Notification Tab



9. Assumptions and Constraints

Assumptions:

- 1. Single Database: The architecture assumes a single MySQL database instance. In a real-world scenario, there might be multiple databases or replicas for scalability and redundancy.
- 2. Stateless Backend: The backend is assumed to be stateless, meaning it doesn't maintain any user session information. Any state information required is either stored in the database or on the client side.
- 3. Single Backend Instance: The diagram shows a single backend instance. In reality, there might be multiple instances for load balancing and failover.
- 4. Monolithic Backend: The backend is assumed to be monolithic, even though there's a mention of services. In a microservices architecture, each service could be a separate entity with its own database.
- 5. Static Pages: The pages (Homepage, ProductPage, CheckoutPage) are assumed to be static and served by Next.js. Dynamic content is fetched via API calls.
- 6. Direct Database Access: The backend has direct access to the database. In some architectures, there might be a separate data access layer or service.

Constraints:

- 1. Scalability: With a single database and backend instance, scalability might be a concern. Horizontal scaling strategies would need to be considered.
- 2. Performance: Direct database access from the backend can introduce latency, especially if the database is not optimized or if complex queries are used.
- 3. Security: Direct exposure of API to the frontend can be a security risk. Proper authentication and authorization mechanisms need to be in place.
- 4. Maintenance: A monolithic backend can become complex over time, making it harder to maintain and deploy.
- 5. Database Dependency: The system is heavily dependent on the MySQL database. Any downtime or performance issues with the database will directly impact the application.
- 6. Limited Integration Points: The diagram shows a single "Services" integration point. In reality, there might be multiple third-party services (e.g., payment gateways, recommendation engines) that the backend interacts with.

10. Dependencies

- Springboot
- React

7. Testing, User Stories, and Acceptance Criteria

		Priority	
Story #1:	Item Checkout	Effort	
As a	user		
l want	to be able to review my order summary	/,	
So that	l can select a payment method, and resshipping address during checkout.	view your	
Acceptance criteria	Given that I am checking out, I should be able to see my order summary and total, address and be able to select the payment method.		
Test Case	Test Case: Select Payment Method Description: Ensure the user can select a payment method during t Preconditions: User is on the checkout page with an order summar Steps: Review the order summary. Select a payment method (e.g., credit card, PayPal). Provide necessary payment information. Continue to the next step. Expected Result: The user successfully selects a payment methon ext step of the checkout process	y displayed.	

		Priority
Story #2:	Notifications	Effort
As a	user	
l want	I would like to be notified of any new disco	unts
So that	l can keep track of all the discounts.	
Acceptance criteria	I should get notified of any new discounts as soo There is option to get notified via app notification There is a view to filter the discounts	
est Case	Quick Access to Latest Deals Description: As a deal-seeking shopper, I want quick access discounts, and special offers on the website's home page to advantage of limited-time promotions. Test Case: Display Latest Deals on Home Page Senario: The user visits the website's home page. Steps to Reproduce: a. Open the web browser. b. Navigate to the website's home page. Expected Outcome: The home page should prominently dis discounts, and special offers.	save money and take

		Priority
Story #3:	Availability of an item	Effort
As a	budget-conscious shopper,	
l want	to see if a specific product is currently in stock at nearby supermarkets,	
So that	I can decide where to buy it without making an unnecessary trip.	
Acceptance criteria	Given I am a budget-conscious shopper, When I search for a specific product, Then I should see a list of supermarkets have the product in stock near me.	that
Test Case	Description: To check availability of product Steps: 1. Search for product 2. View item page Expected Outcome: Availability of product on different stores is seen	

		Priority	
Story #4:	Delivery Tracking	Effort	
As a	online shopper		
l want	to be able to track my order's delivery status	in real-time,	
So that	I can be informed of its whereabouts and estimated time of arrival, ensuring I'm availal	ble to receive	e it.
Acceptance criteria	Given I have placed an order and it's ready for delivery, When I go to the 'My Orders' section in the application, Then I should see a 'Track Delivery' option for my recent order. Given I click on the 'Track Delivery' option, When the tracking page loads, Then I should see the current status of my delivery (e.g., "Out for delivery", "Arriving soon", "Delayed"). Given I'm on the delivery tracking page, When I look at the delivery details,		
Test Case	Test Case: Track delivery Preconditions: Logged into an account. Steps 1. Make a mock purchase to be dilvered 2. Track the delivery drive Expected result: Delivery driver is accurately tracked.		

		Priority
Story #5:	Product Search and Categorization	Effort
As a	online user	
l want	to easily search for products and view them c	ategorized,
So that	I can quickly find what I'm looking for without browsing through unrelated items.	
Acceptance criteria Given I'm on the app homepage, When I use the search bar, Then I should see relevant product results based on my search query. Given I'm browsing products, When I look at the navigation or filter options, Then I should see products categorized (e.g., "Dairy", "Electronics").		
Test Case	Test Case: Search for items Steps: 1. Input an item into the search bar 2. Check if system returns related items Expected output: System only shows items related to the search ten .	m.

		Priority		
Story #6:	Price Comparison	Effort		
As a	Online Shopper			
l want	to be able to compare the price of a produ supermarkets	to be able to compare the price of a product at different supermarkets		
So that	I can save on spending			
Acceptance criteria	Given I am an online shopper, when I click on a searched product, Then I get a list of all prices for that product supermarkets around me.	in		
Test Case	Test Case: Compare prices for items from different stores Steps: 1. Search for an item 2. Click the item from the search page • Expected result: The prices for the Item from different stores a	are displayed.		

		Priority	
Story #7:	Saved Items Page	Effort	
As a	logged in online shopper		
l want	to be able to view a list of my sav	ed items	
So that	I can make changes to my selection	n	
Acceptance criteria	Given I am a logged in online shopper, when I click on the saved option on the navigation bar, Then I get a list of all products I have added to my list along with their respective loctions, prices and quantities.		
Test Case	Test Case: Verify a logged-in online shopper can access and view their list of save product details. Preconditions: User is logged in to an account Steps: 1. Visit the saved items page Expected result: System returns all the items saved by this account. 1. Item Checkout	ed items, including	

		Priority	
Story #8:	Home Page	Effort	
As a	deal-seeking shopper		
l want	to have quick access to the latest deals, disc and special offers on the website's home pa		
So that	I can save money and take advantage of limited	-time promotions	
Acceptance criteria	Given I open the website's home page, When I scroll or navigate to the "Ongoing offers" section, Then I should be presented with a curated list of current deals and offers.		
Test Case	Description: Home page has good design for it Steps: 1. Open the website Expected outcome: Good designed home page that clearly shows all the i	features.	

		Priority	
Story #9:	Filter Search	Effort	
As a	price-conscious shopper		
l want	to filter all the search results for an item to than a certain amount	less	
So that	l can stay in my budget.		
Acceptance criteria	Civan that I am on the Coarch regults nage		
Test Case	Filter Search Results by Price Description: As a price-conscious shopper, I want to filter search less than a certain amount to stay in my budget. Text Case: Filter Search Results by Price Senaric: The user searches for a specific tem and applies a price support of the search bar. Learner the item's name in the search bar. Learner the item's name in the search bar. Learner the item's name in the search results should only display items \$50.	ce filter.	

		Priority	
Story #10	Filter Search	Effort	
As a	online shopper who does not like the qualit	y of one brand,	
I want	to filter all the search results for an item to show the item in all brands except that brand,		
So that	I can save time while searching.		
Acceptance criteria	Given that I am on the Search results page, When I click on the the "Filters" option Then I can see the option to filter the item by brand.		
Test Case	Filter Search Results by Brand Description: As an online shopper who does not like the qualit filter search results for an item to show the item in all brands: time while searching. Test Case: Filter Search Results by Excluding Brand Scenario: The user searches for a specific item and excludes a steps to Reproduce: a. Enter the item's name in the search bar. b. Apply a filter to exclude a specific brand. Expected Outcome: The search results should not display item brand.	except that brand to save particular brand.	

		Priority	
Story # 11	Category search	Effort	
As a	user looking for specific products		
l want	to navigate through a category dropdown on the website's home page to easily filter and explore different product categories and subcategories,		
So that	I can quickly find the items I need.		
Acceptance criteria	Given I open the app's home page, When I interact with the category dropdown menu, Then I should see a list of main categories, including "All," "Specials," "Grocery," "Meat," "Dairy," and more.		
Test Case	Description: Verify that a user can view items organized by their response the category page and using filters. Preconditions: User is on the category page. Steps: 1. Navigate to a specific category page (e.g., "Electronics," "Clothing 2. Observe the displayed items within the chosen category. Expected Result: The user can view a list of items that belong to the only items that match the filters selected.	ig." "Home Decor").	

Story #:12	Category search	Priority
		Effort
As a	health-conscious shopper	
l want	to be able to easily filter and explore organi specific categories using the app's category	
So that	I can make healthier choices while shopping	g.
Acceptance criteria	Given I open the app's home page, When I interact with the category dropdown n Then I should see an option to filter for "Orga products within each main category.	
	Description: Check that the category section is working. Preconditions: User is on the category page. Steps: 1. Choose category from menu 2. Get all items in that category Expected Result: User get items in that category.	

Story #:13		Priority	
	Product Details Section	Effort	
As a	user allergic to certain allergens,		
l want	to check the ingredients list and get information on the allergens contained in a pro	duct	
So that	I can buy the safe product for myself.		
Acceptance criteria	Given that I can see a searched product, When I click on the product and scroll to the "Product Details" section, Then I can see the entire ingredients list and allergen warnings for the same.		
Test Case	Description: Show details of a product to the user Steps: 1. Click on product to visit its product page. 2. Observe the displayed product details, including: Expected Result: The user is able to view the Product name, Description, product, Price, Shipping information, Ingrediants/Contents and Customer product information on the product detail page.		

		Priority
Story #14	Product Details Section	Effort
As a	shopper confused about the storage of various p	oroducts,
l want	to know the storage instructions for a product	
So that	I can store it in the correct manner.	
Acceptance criteria	Given that I am on the search results page, When I click on a product and scroll to the "P section, Then I can see the storage instructions provi for that product.	
Test Case	Test Case: Display Storage Instructions for a Product Scenario: The user selects a specific product and seeks its storage it Steps to Reproduce: a. Browse the product catalog. b. Select a product of interest: c. Look for storage instructions on the product details page. Expected Outcome: The product details page should clearly display instructions for the selected product.	

		Dul a vita .	
Story #:15	Item Checkout Page	Priority	
		Effort	
As a	online shopper,		
l want	to be able to view my selected items one last time during checkout,		
So that	I know which items are from which store(s).		
Acceptance criteria	Given that I am on the "Saved Items" page, When I click on the the "Checkout" option Then I am taken to the checkout page where I can see all the items and their price(s) listed store wise.		
Test Case	Description: To buy the item required Preconditions: User is on the checkout page with an item selected. Steps: 1. Select "Purchase" button. 2. Enter address 3. Choose payment method 4. Confirm payment details Expected Result: The user's order will go through and be delivered to th	em.	

SEPT Feature Project

