



# CS410 Team Bronze

## Fall 2025

### Design

# Spoiler Alert

## ‘No Surprises at the Table’



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# Meet the Team!



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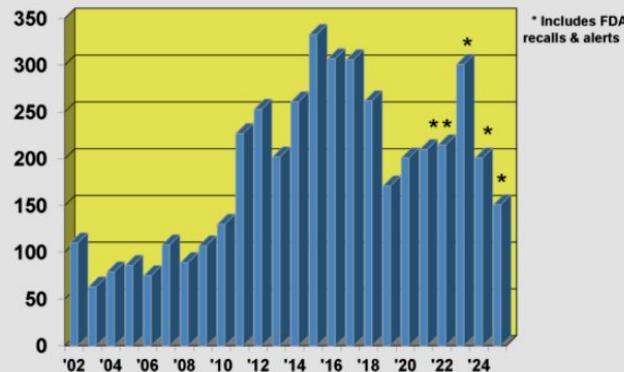


**Mark Stoegbauer**  
Webmaster

# FSIS Issues Public Health Alert For Ready-To-Eat Meals Containing Pasta That May Be Contaminated with Listeria

## Food recalls happen all around us...

U.S. FDA Food Allergen Recall Incidents  
2002-2025



- Foodborne Illnesses such as Listeria and Salmonella. Allergen Contamination. Foreign Materials, including heavy metals.
- These are all dangerous, especially for the most vulnerable among us.
- These can all be life threatening for the elderly, pregnant, allergic, and immunocompromised.

# And they're still happening.

- The FDA has reported almost 300 recalls in the last year.
- This comes out to millions of pounds of food.
- Almost 60 million pounds of Hillshire Brands corn dogs were recalled late this September.

58 million pounds of corn dogs recalled over possible wood in the batter

 nbcnews.com | 1 day ago

Jimmy Dean and State Fair are included in the recalled brand list.



News report on the huge corn dog recall.



## Listeria Outbreak Linked to Prepared Pasta Meals

### FAST FACTS

- **Cases:** 20 (3 new)
- **Hospitalizations:** 19 (3 new)
- **Deaths:** 4 (1 new)
- **States:** 15 (2 new)

CDC report about an ongoing recall involving Trader Joes and Albertsons Pasta

# Yet, many don't hear about recalls.



TASTE OF HOME. GETTY IMAGES

Two potential issues are ignorance and incentive. Some people just don't think they could get sick from the chance of encountering a recalled good, or just don't think about it.

The average person does not see many FDA or CDC reports.

According to Dr. William Hallman during the 2025 Food Safety Summit:

- 13% of Americans visit government sites for recall information.
- Only 3% are subscribed for automatic reports on recalls.

This can even affect the companies terribly. With some infected food lawsuits involving millions of dollars.

Such as when Conagra paid over \$40 million in civil lawsuits over salmonella in peanut butter.

# The Problem

Food recalls happen all the time, however, there isn't an adequate reporting system overall. It is vital that everybody receives topical recall reports promptly, yet many do not. This is a major safety concern for consumers, as companies don't take proper precautions.

Despite official resources being a thing, their own notifications are restricted to email, not an optimal form in the age of the smartphone. Existing apps also fall short, not being personalized or appealing enough to the average user to be noteworthy.





# Who is Affected

## Users

### **Everyday consumers:**

Anyone who buys, cooks, or consumes food can benefit.

### **Health-conscious individuals:**

People with dietary restrictions, chronic illnesses, or vulnerable immune systems.

### **Families and caregivers:**

They need immediate alerts about recalls to protect their children, elderly, or others at higher risk.

## Stakeholders

**Farmers:** Faster reporting helps them protect their reputation and respond quickly.

**Stores:** Timely alerts allow them to pull unsafe products from shelves before customers are harmed.

**Restaurants:** Food service providers who could unknowingly serve recalled items.

**Regulatory agencies:** Improves public safety by ensuring information reaches more people faster

# Problem Characteristics

- Cause
- Effect

## Awareness Gap:

- Food recalls announced by the FDA/USDA spread slowly and unevenly.
- Consumers aren't aware of unsafe conditions that may cause harm

## Customization Gap:

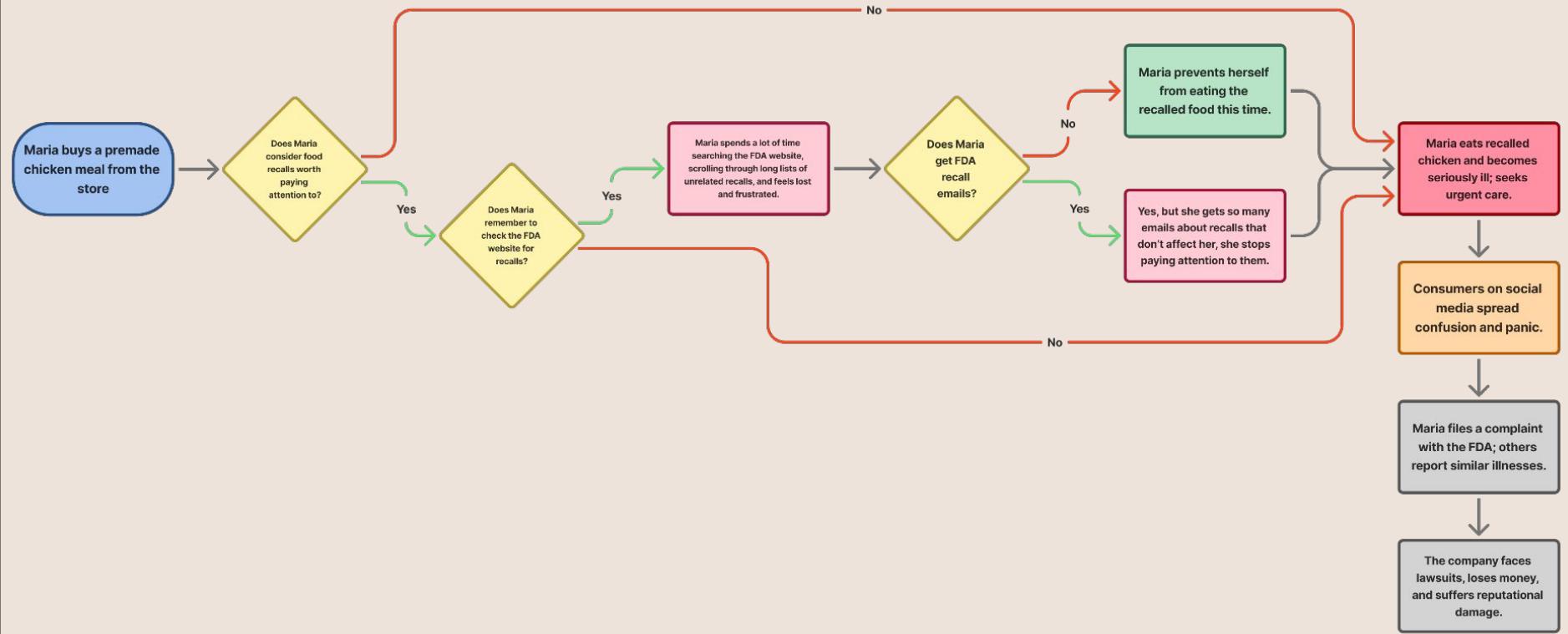
- Other apps do not allow you to customize what medium you are notified by, rather only having one method of notification
- User experience suffers at the cost of mediocre interfaces

## Engagement Gap:

- Many consumers don't view recalls as something that requires urgent attention
- This causes consumers to be uninformed for prolonged periods of time, causing risk.

## Urgency Gap:

- There are no direct, reliable channels to consistently reach users with information regarding recalls
- Misinforms people with allergies to be put at risk



## Current Process Flow



# Solution Statement

Spoiler Alert: An innovative web & mobile application that delivers personalized, immediate, and trustworthy food recall alerts.



- ★ **Speed & Urgency** → Instant notifications (push, email).
- ★ **Clarity** → Simple, consumer-friendly language for critical information.
- ★ **Personalization** → Allergy filters, barcode/receipt scanning, custom channels.
- ★ **Trust** → Direct FDA/USDA data in one reliable platform.

Result: Families, caregivers, and vulnerable individuals stay safe – no surprises at the table.

# Solution Characteristics

## Centralized Recall Awareness

A single platform where recall information is collected and delivered consistently so consumers don't miss important updates on recalled products. Information is conveyed in a clear and concise manner to make recall information easy for consumers to understand.

## Personalized Notifications

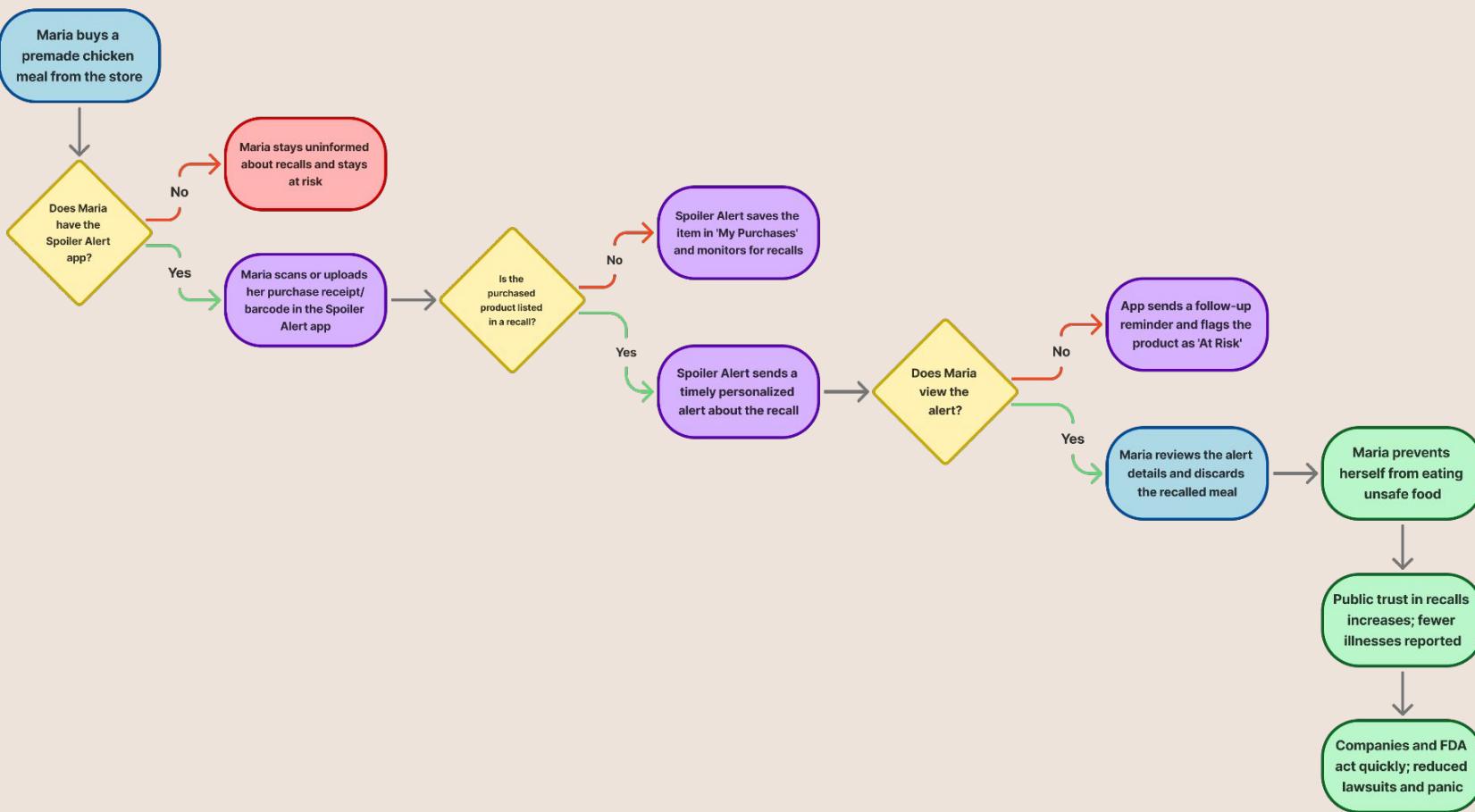
Users are given flexible options on how they wish to be notified of recalls. The consumer has the customizability to make their choice of app notifications, text messages, or emails to fit best into their daily life.

## Consumer Motivation

Notifications highlight the immediate importance of recalls. Users will be able to get relevant recall information based on their individual preferences, keeping them motivated to stay informed.

## Immediate and Reliable Alerts

The use of dependable and customizable delivery of notifications ensures recall information reach users without delay. Users that have specific allergies or conditions can have alerts marked as critical.



Solution Process Flow

# Basically, what will it do?



- Provide the user with **notifications** on recalls for **food, home goods, cosmetics, and pharmaceuticals**
- Allow the user to choose the form of notifications they get such as **email or in-app notifications**
- The user will have a limited number of scans per week to **read barcodes on specific products** and save it to their inventory in order to be later notified for future recalls
- Provide up-to-date **FDA notifications** on recalls
- The user will be able to search **keywords** such as “chicken” or “bread” to search for recalls from **any company**, as well as searching for the company itself
- Allow the user to add specific **allergies** in order to get future notifications on recalls involving cross contamination or previously unlisted allergens in products
- Allow the user to keep track of their purchase history through an **inventory**



# What will it do when you go premium?



- The user will have an unlimited number of scans to **read barcodes on specific products** and save it to their inventory in order to be later notified for future recalls
- Allow the user to **scan receipts** from recent purchases to add all items from the receipt to their inventory in order to be notified for future recalls



# What it doesn't do:



- The app will not **crowdsource information** on recalls in any way.
- Provide information for recent recalls on **automobile or watercraft** products
- Allow the user to take a picture of a product **outside of its container** to find recall information on it
- Guarantee **legal/medical advice** or substitute official government recall sources
- Track recalls **outside the U.S.**
- Act as a **universal scanner** for every product type on the market
- **Automatically refund or replace** recalled products
- Detect **counterfeit goods** or **verify authenticity** of products
- Work without **internet access**

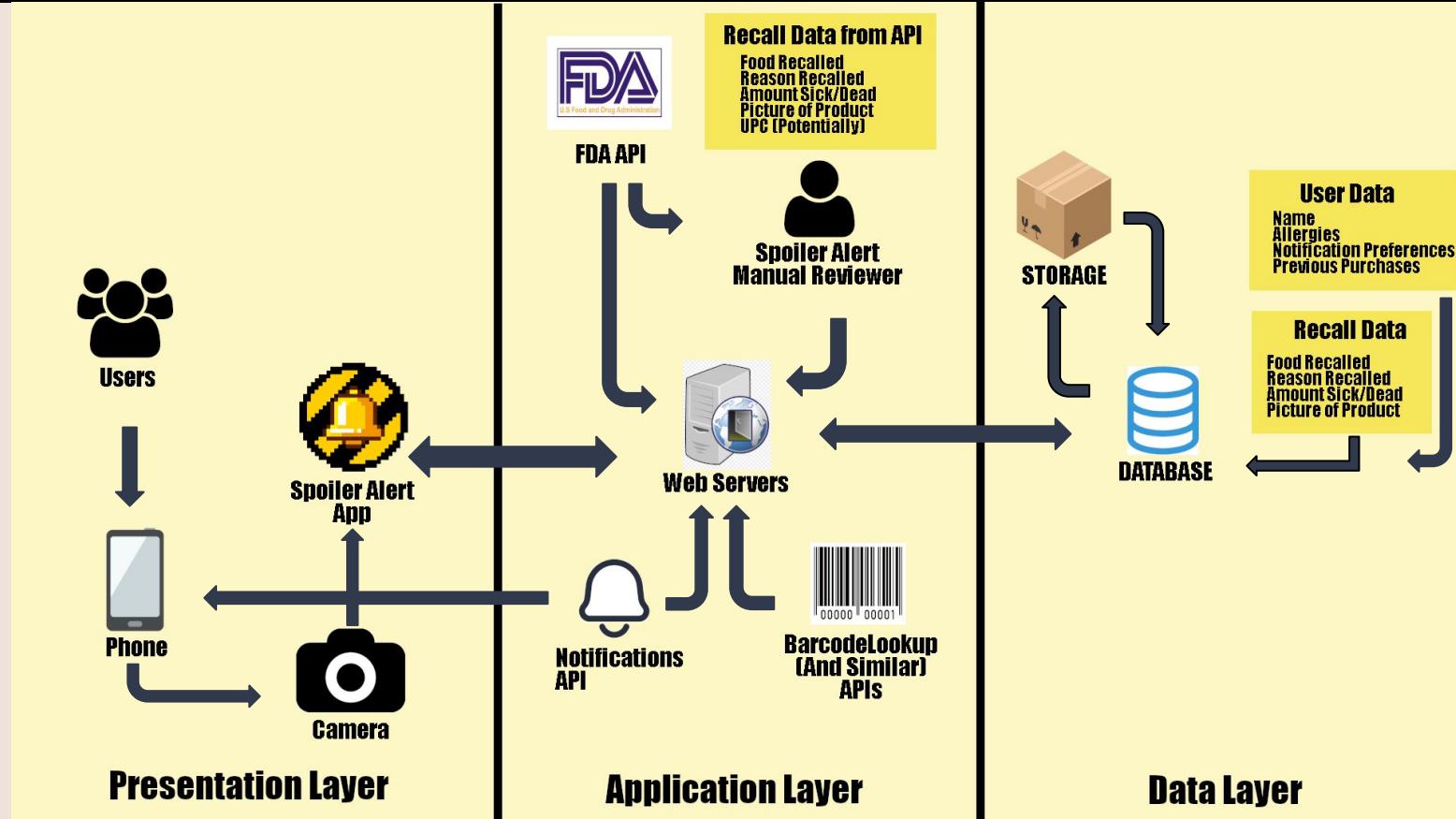


# Competition Matrix



	Spoiler Alert	Food Recalls & Alerts	Target	USA Recalls
Food Recall Reports	✓	✓	✓	✓
User-Friendly Interface	✓	✓	⚠ Too complicated	✓
Notification Customization	✓ Email, Push-notifications	⚠ Push-notifications	✗	⚠ Email, Push-notifications
Barcode Scanner (Free)	✓	✗	✗	✓
Subscription for Premium Features	✓	✓	✗	✓
Scan Receipt (Premium)	✓	✗	✗	✗
Customized Allergens Alerts (Premium)	✓	✗	✗	✗
Keyword Recall Search	✓	✓	✓	✓

# Major Functional Components





# Development Tools

Communication	Discord
Version Control	Git / GitHub
IDE	VSCode
Collaboration	ClickUp
Front End	Swift
Back End	Python (Flask Library)



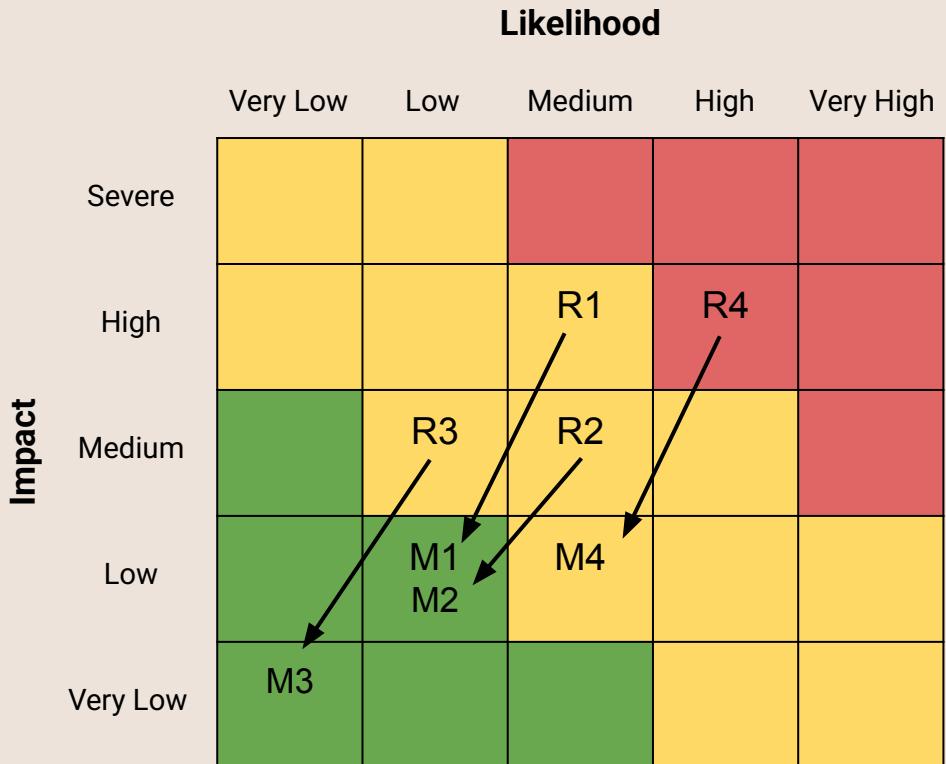
# User Risks

## Risk Factors:

- R1:** Users may suffer from alert fatigue, from recalls concerning products not relevant to the user.
- R2:** Users may forget to turn push notifications on, causing a delay in information.
- R3:** Regional differences may cause misinformation.
- R4:** Users may not want to share their personal medical information with the app.

## Mitigations:

- M1:** Spoiler Alert customizes reports, so the user only gets notified of the reports that are relevant to them.
- M2:** Spoiler Alert will alert users that their notifications are off whenever they open the app.
- M3:** Spoiler Alert will ensure that the regions affected will be one of the first things users see when looking at a recall.
- M4:** Spoiler Alert will ensure users that the app will encrypt and responsibly store the data. Users may also continue to use the app without entering this data at all.





# Technical Risks

## Risk Factors:

**R1:** Certain stores may have unique product code formats on their receipts that the app will have trouble looking up.

**R2:** Low user camera quality can result in unreadable scanning

**R3:** APIs may have downtime or contain broken data, slowing down or stopping Spoiler Alert's ability to report.

**R4:** Most recall APIs (FDA, USDA, CPSC) do not include UPCs in their metadata, making it difficult for Spoiler Alert to match scanned product barcodes to active recalls.

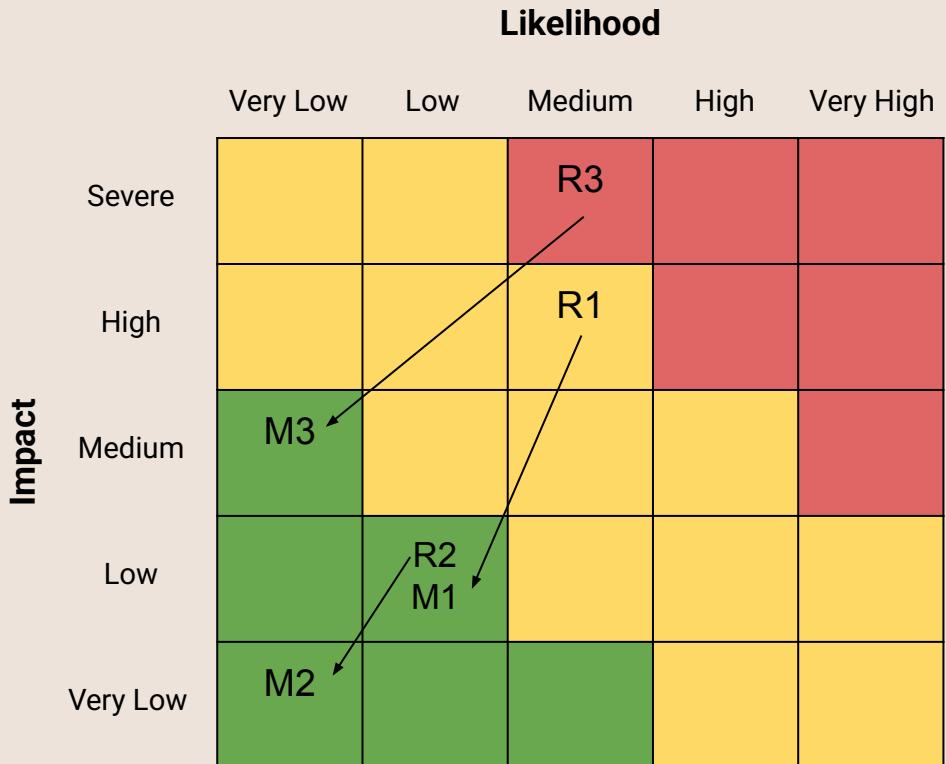
## Mitigations:

**M1:** Spoiler Alert will work with the bigger stores to make those product codes searchable for recall logging.

**M2:** In the case camera quality makes the receipt unreadable, the user can manually input the product code.

**M3:** If APIs for any reason are unreadable, the servers will attempt to read from the API a few more times. If this still fails, sources will be manually reviewed by staff until the API works once more.

**M4:** Spoiler Alert will maintain its own UPC database from manufacturer sites, official recall web pages, and product catalogs when the real APIs don't include it.





# Legal/Security Risks

## Risk Factors:

**R1:** Personal information, such as medical and payment information, can be subject to data leaks.

**R2:** Relying on companies relaying information to Spoiler Alert may cause misinformation and conflict with FDA announcements.

**R3:** Companies may try to litigate Spoiler Alert for reports that damage their image.

**R4:** The app may collect sensitive personal and medical information without consent.

**R5:** User purchases a product that gets recalled later on. SpoilerAlert may not connect the purchase to the recall and will fail to inform the user.

## Mitigations:

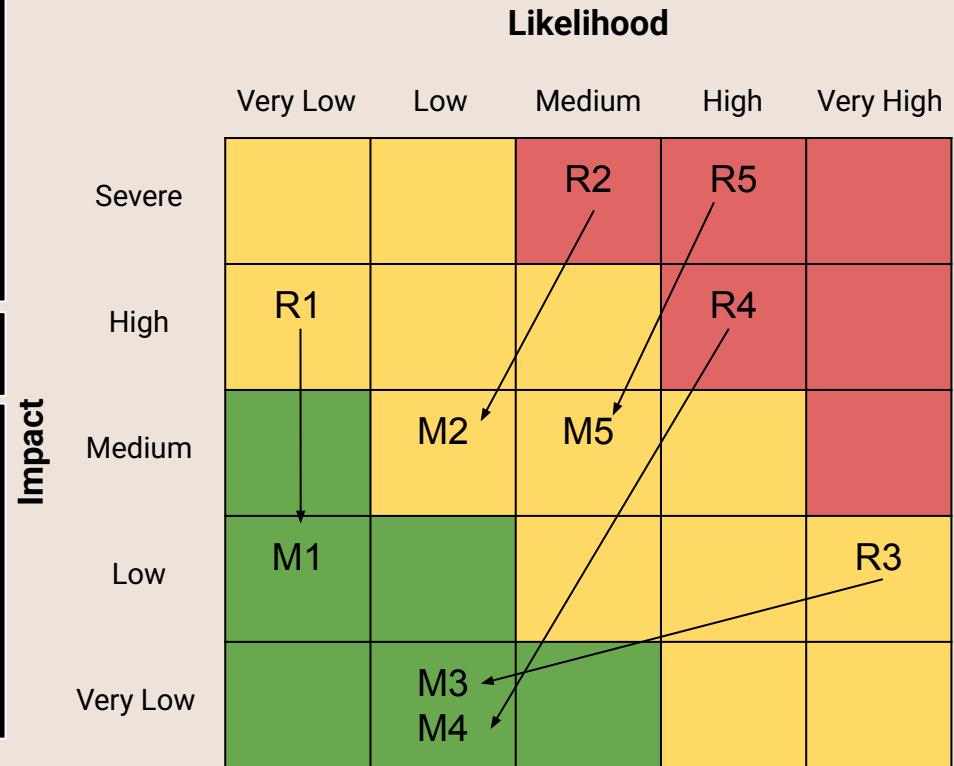
**M1:** SpoilerAlert uses up-to-date security protocol to assure against data attacks.

**M2:** Spoiler Alert will cite sources and allow the user to authenticate the information they are receiving is true.

**M3:** Companies should be held accountable for harm regardless of litigation.

**M4:** App informs and gets users consent with terms of service and privacy policy agreement upon account creation.

**M5:** Popup disclaimer and user agreement to warn about possible missed recalls and limit SpoilerAlert's liability.



# Our Conclusion

Spoiler Alert is important because it is the next frontier in user safety and awareness!

Many of those who may not get quick, consistent communication are at risk of food poisoning and contaminated food. Awareness could save millions of lives!

With multiple channels of notification, Spoiler Alert is fills the gap for obtaining recall information, combining all the utilities of existing solutions and more.



**Spoiler Alert**  
**'No Surprises at the Table'**



# User Roles

## Free User:

Free users get the baseline functionality of Spoiler Alert, which includes:

- Recall Notifications
- Keyword Searching
- Inventory & Barcode scanning

## Premium User:

Premium users get extended functionality from Spoiler Alert, including:

- Everything Free users have access to
- Receipt scanning
- Unlimited scanning

## Recall Reviewer:

RRs are in charge of manually updating recall information the API doesn't, including:

- Keyword searching
- Recall Notifications
- Recall UPC Linking

## Administrator:

Admin's goals are to ensure quality control and consistency across the app.

Admins have all of the functionality of the app and can make direct changes to information and member status.



# User Stories

As a new user, I would like to sign up for Spoiler Alert, so I can be notified immediately when a food recall affects me.

As a general user, I would like to receive notifications through email or in-app notifications so I can be alerted no matter where I am.

As a general user, I would like to view a list of recent recalls on the app page, so I can stay informed even if I miss an alert.

As a general user, I would like to search and filter recalls by food type or brand, so I can quickly find products I use.

As a general user, I would like to view recall details, such as the cause and affected regions so I can decide whether I need to take action.

As a general user, I would like to create an account that saves my preferences, so I don't need to reselect them every visit.

As a basic user, I would like to use my limited barcode scanning to check for recalls and get notifications on individual items.

As a general user, I would like to filter include non-food items, like cosmetics or medication, so I have a complete safety overview.



# User Stories

As a premium user, I would like to set up advanced filters, so I only see the recalls most relevant to my household.

As a premium user, I would like to scan receipts, so I can instantly check whether my purchased items are affected.

As a premium user I want to have unlimited barcode scanning to check for recalls and get notifications on individual items.

As a recall reviewer at Spoiler Alert, I would like to be able to link an unlisted UPC I found to an ongoing recall in the app.

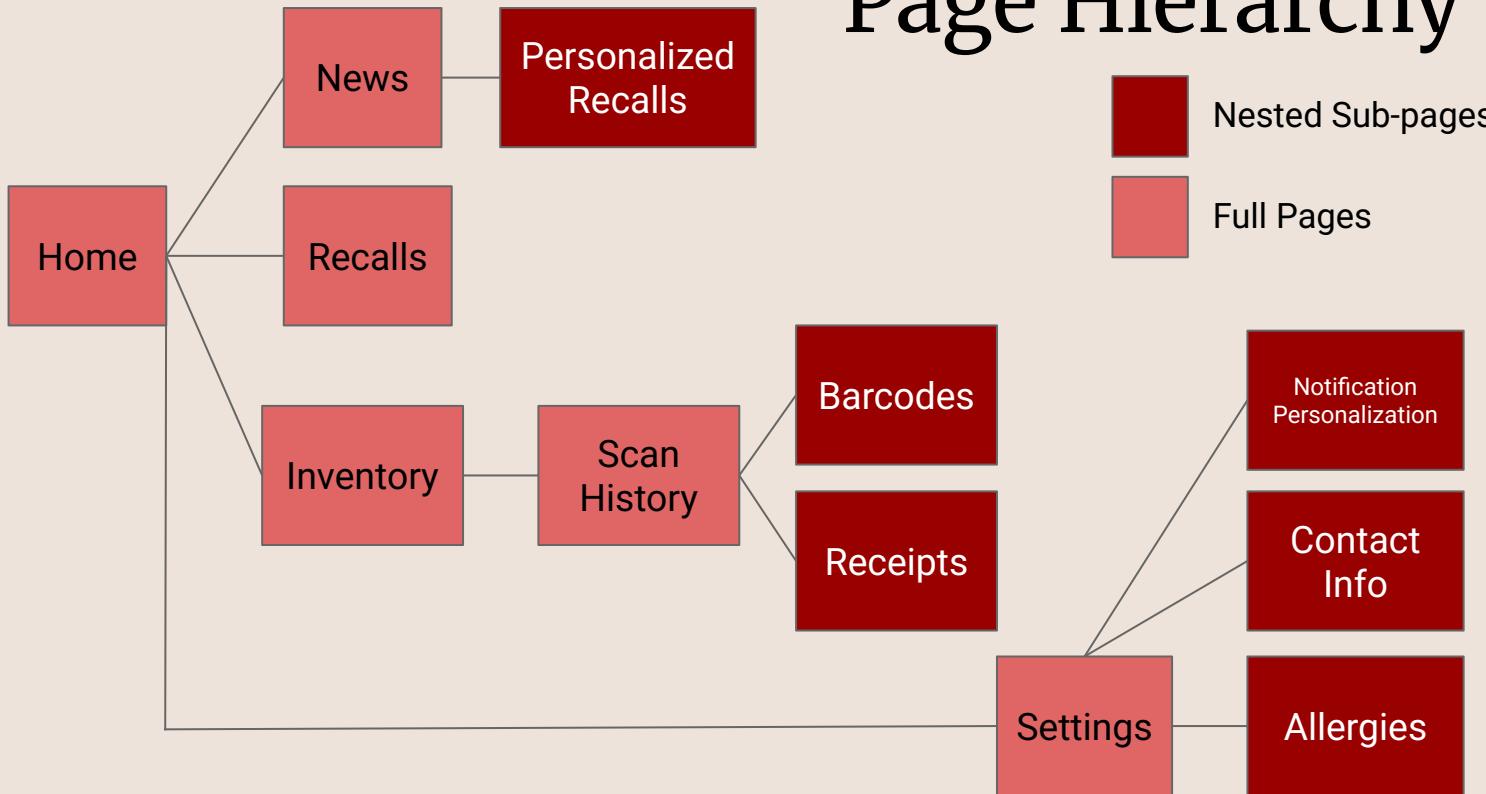
As a recall reviewer, I would like to import recalls and update missing information if the API fails to import recall data.

Category	Feature	Free User	Premium User	Recall Reviewer	Admin
Notifications	Recall Notifications	✓	✓	✓	
Item Tracking	Inventory Management	✓	✓		
	Barcode Scanning	⚠	✓		
	Receipt Scanning		✓		
Searching	Keyword Recall Search	✓	✓	✓	
Employee Tools	Recall UPC Linking			✓	

# Feature Table



# Page Hierarchy Layout

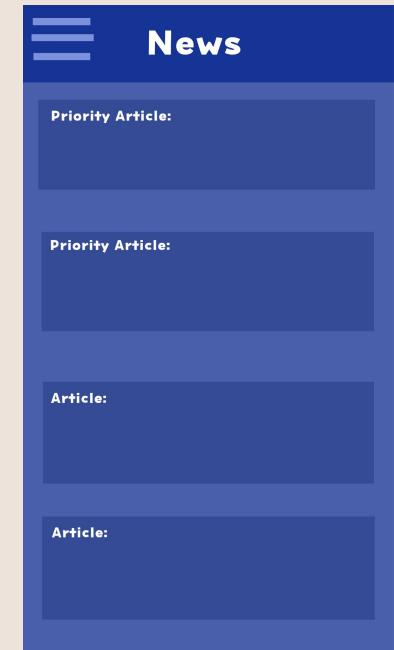
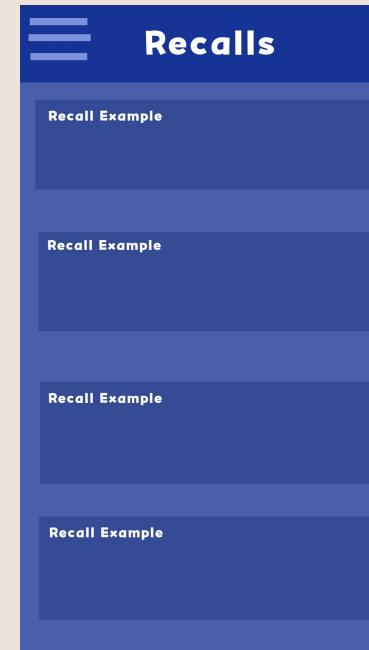
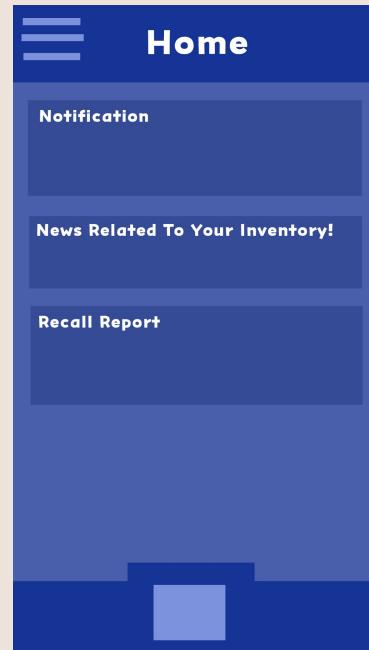


User Interface Mockups



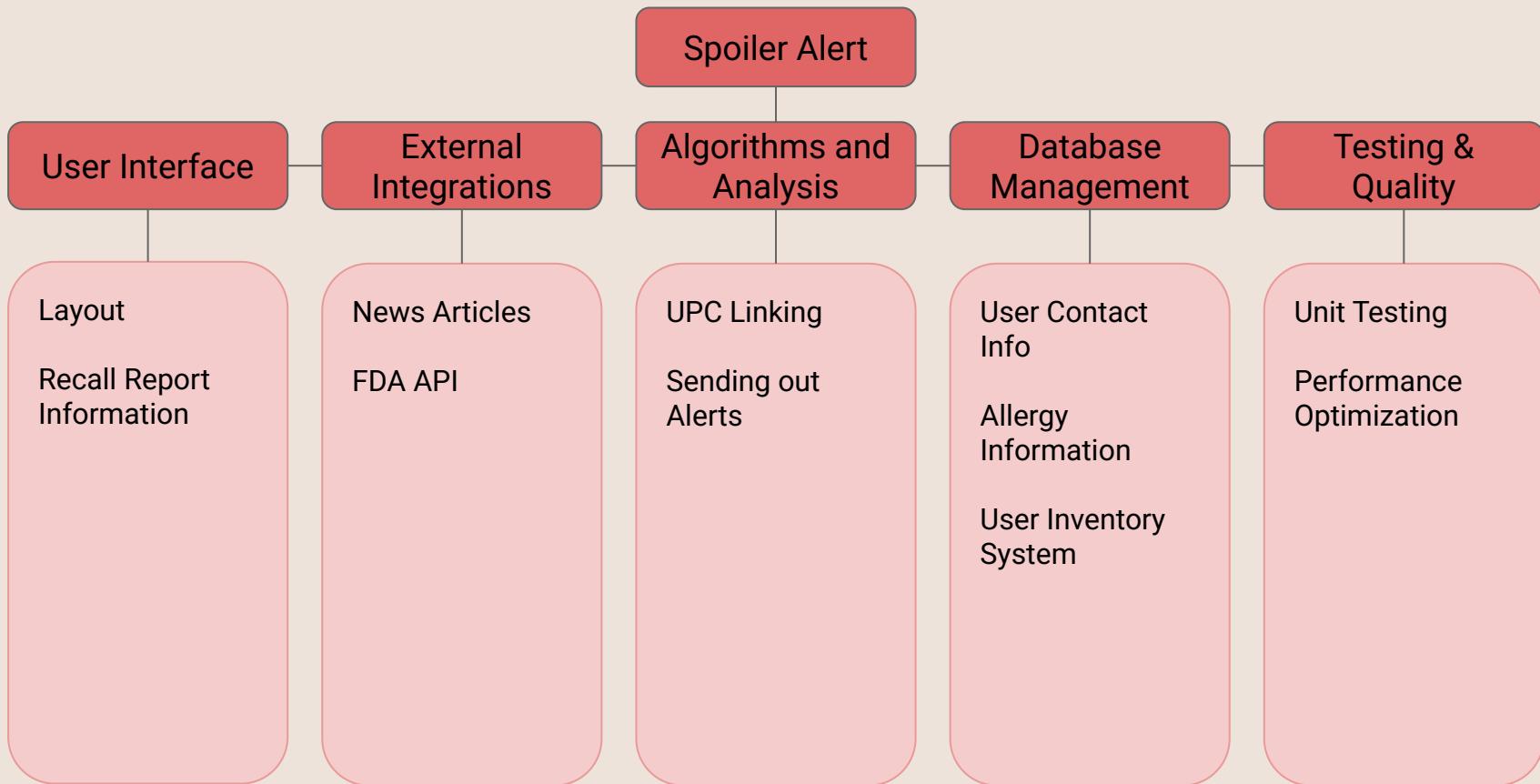
- Dark mode is planned
- An expandible hamburger menu allows for a less cluttered app environment
- The home page displays important notifications and reports related to you (if any)
- Recalls are expandable and can also show related information like articles and similar recalls
- A settings menu allows you to change important information when necessary

# Page Design



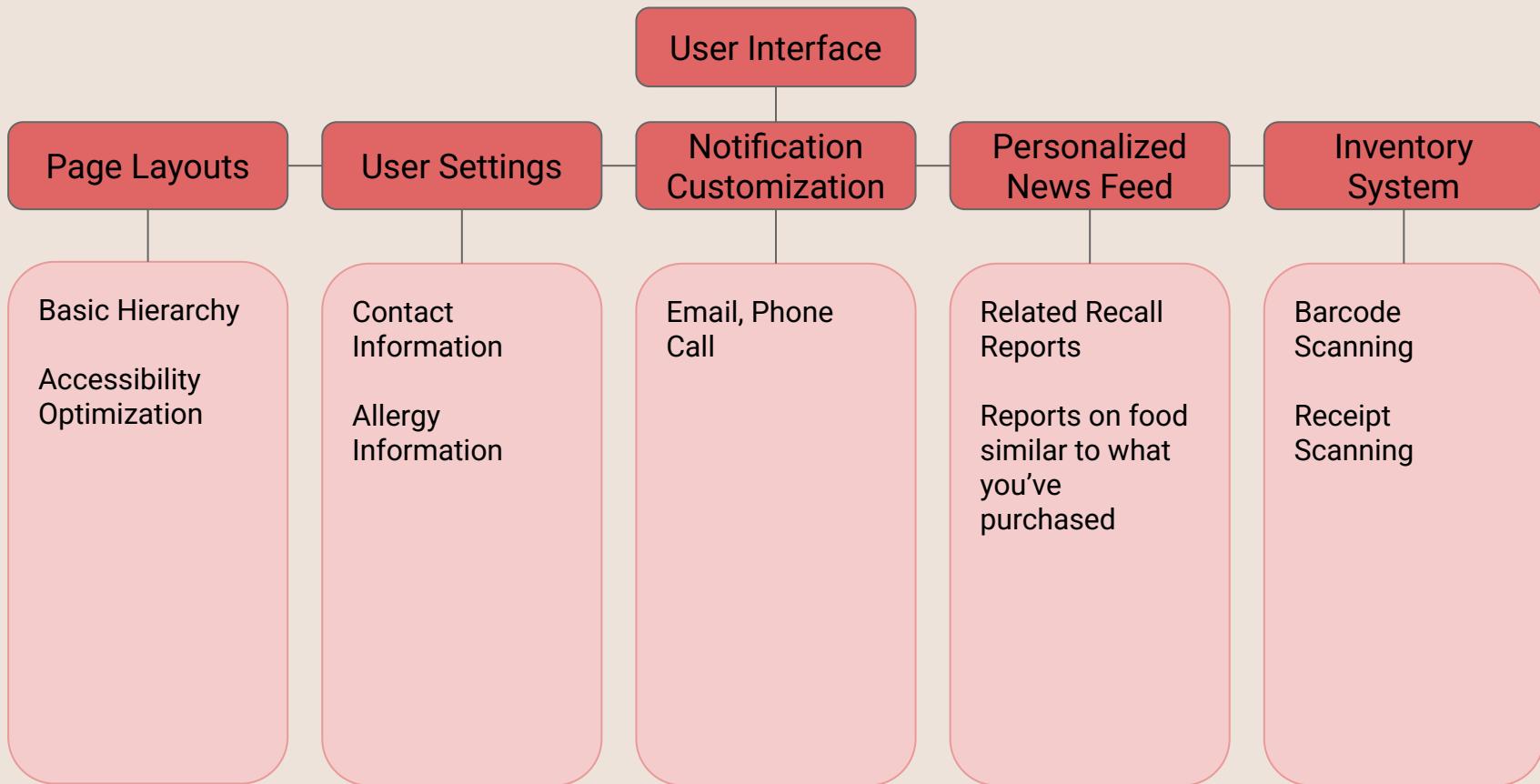
## User Interface Mockups





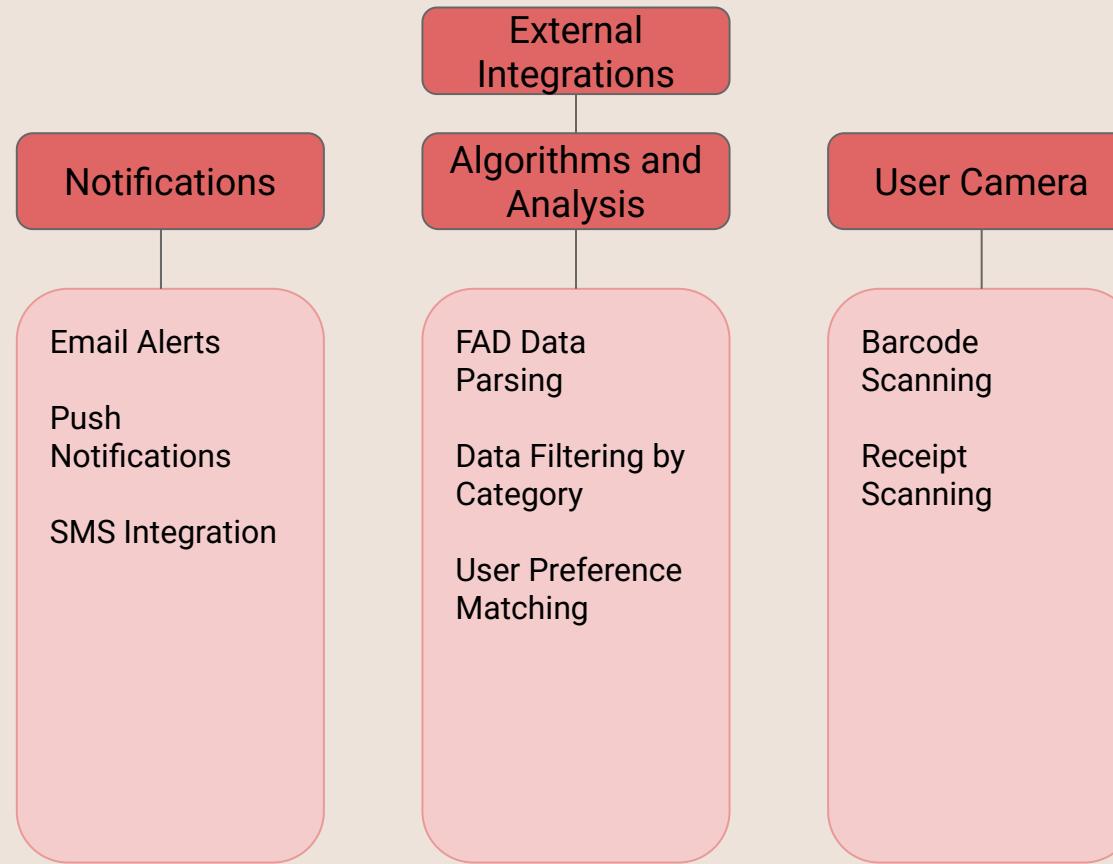
# Work Breakdown Structure





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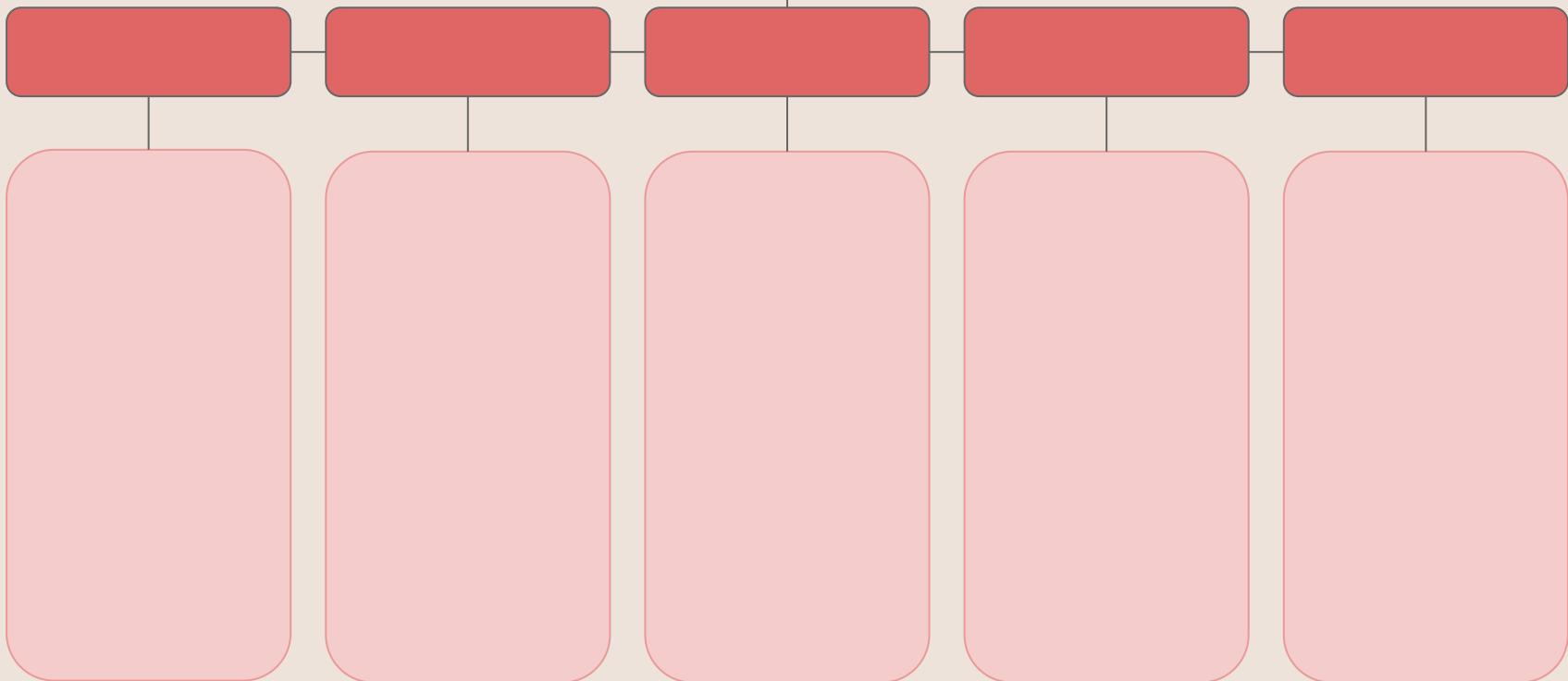




# Work Breakdown Structure

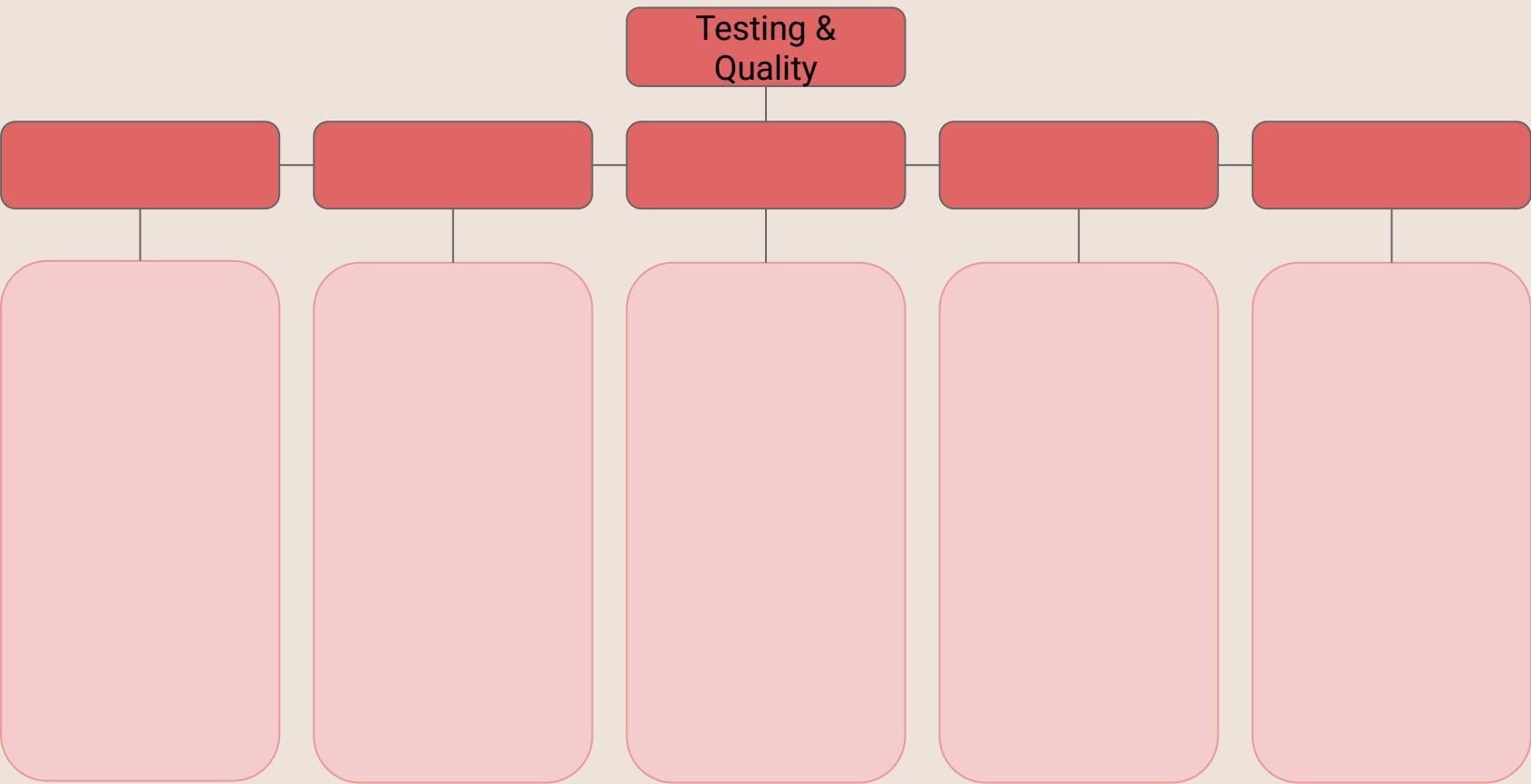


## Algorithms and Analysis



# Work Breakdown Structure





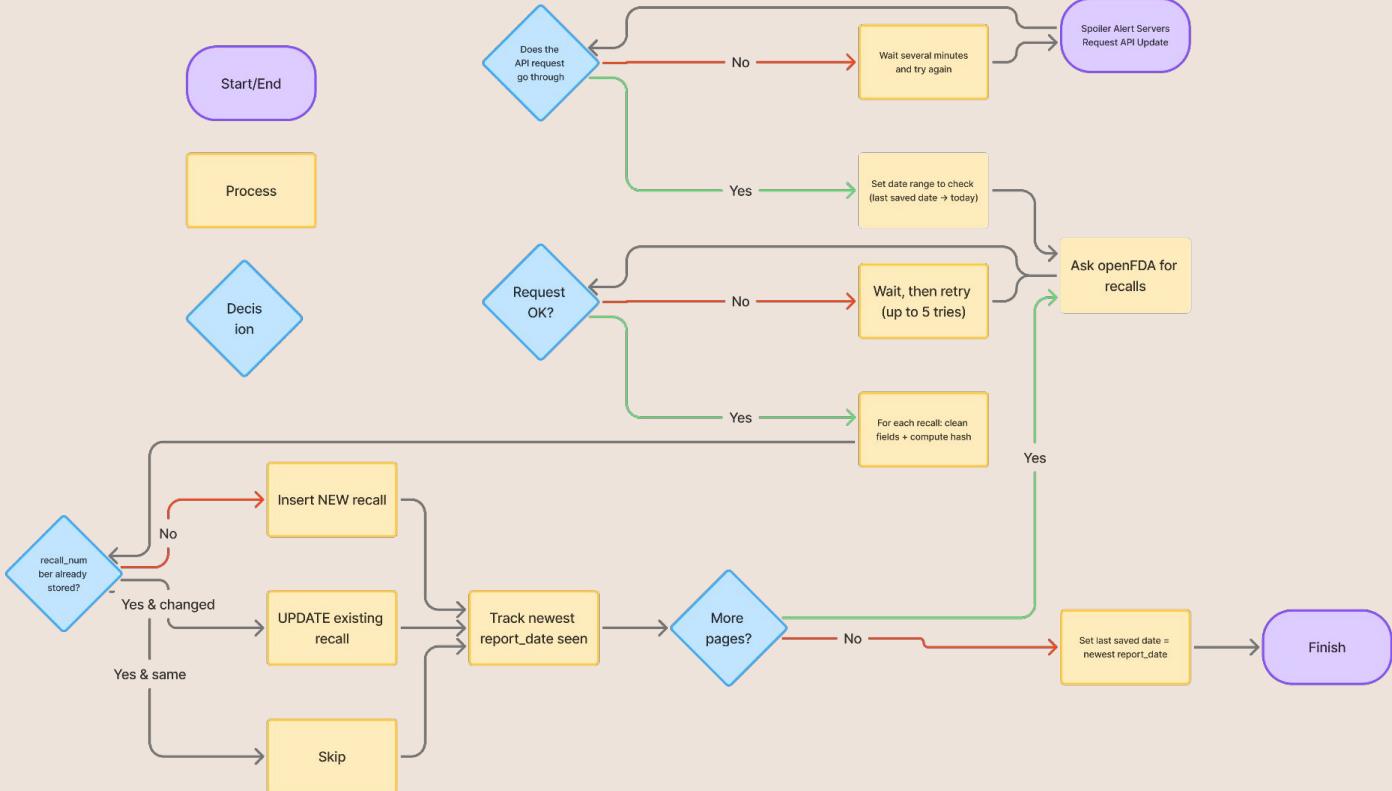
# Work Breakdown Structure



# Algorithms: FDA API Data Grabbing



Description of individual algorithm



# Algorithms: Recall to UPC Linking

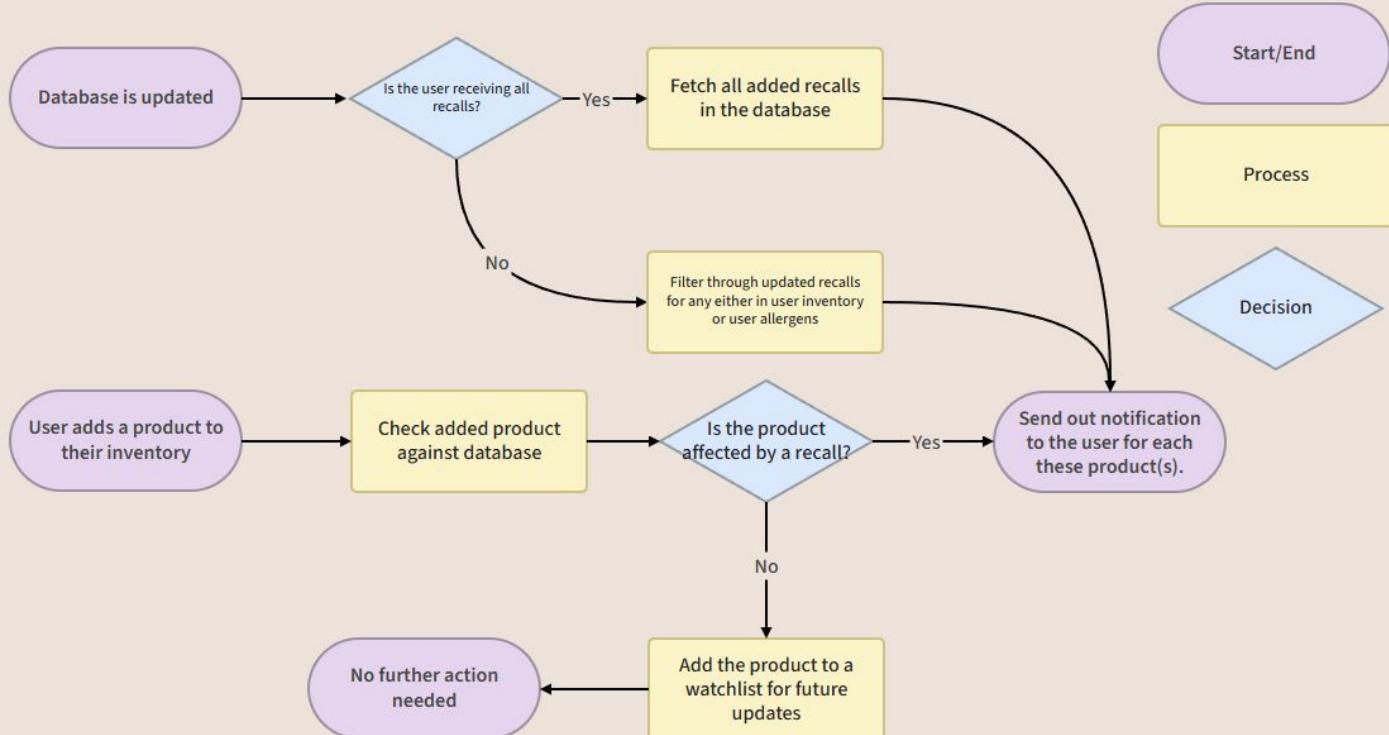


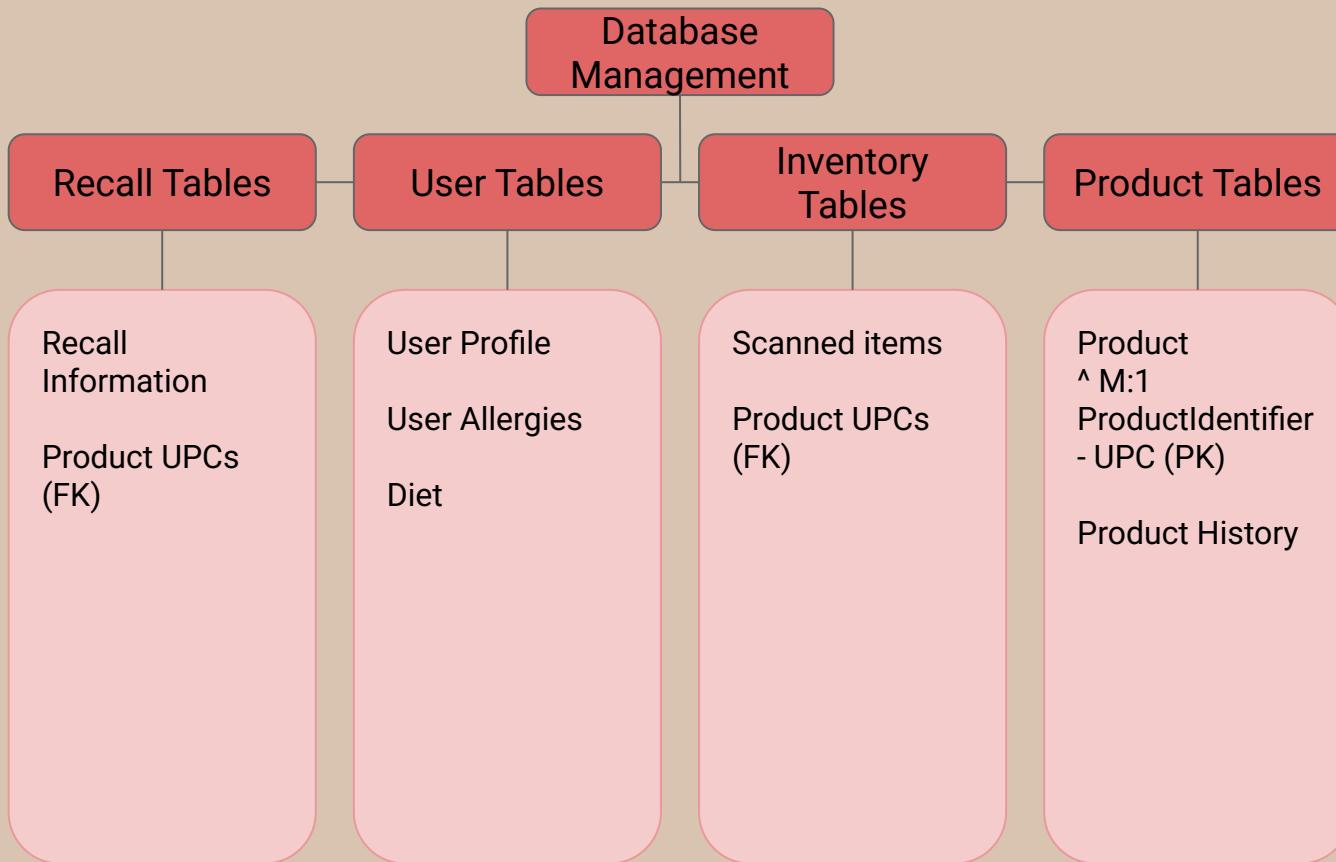
Description of  
individual  
algorithm

# Algorithms: Sending out recall alerts



Description of individual algorithm

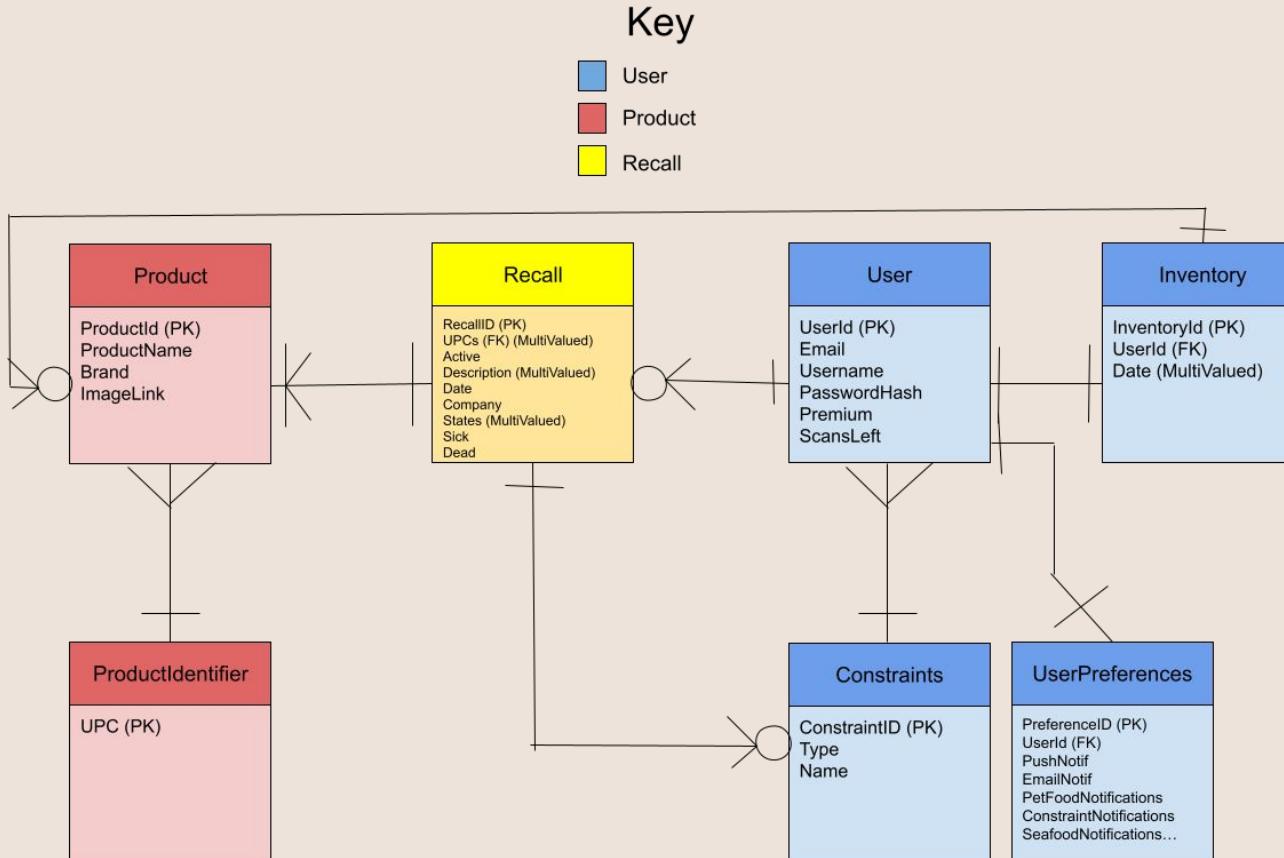




# Work Breakdown Structure



# Database Schema



# Sprint Breakdown

Sprint 0	Sprint 1	Sprint 2	Sprint 3
<input type="checkbox"/> Setup Github repo	<input type="checkbox"/> Build login and signup	<input type="checkbox"/> Implement user accounts and profiles	<input type="checkbox"/> Integrate FAD/USDA recall APIS
<input type="checkbox"/> Prepare dev tools and frameworks	<input type="checkbox"/> Add basic navigation and UI layout	<input type="checkbox"/> Connect to backend for user data	<input type="checkbox"/> Display recall feed and search features
<input type="checkbox"/> Setup code repositories			
Sprint 4	Sprint 5	Sprint 6	Sprint 7
<input type="checkbox"/> Add push notifications	<input type="checkbox"/> Add premium features	<input type="checkbox"/> Create app outline and design for user-friendly access	<input type="checkbox"/> Test and fix bugs
<input type="checkbox"/> Enable alert customization settings	<input type="checkbox"/> Set up payment and subscription flow		<input type="checkbox"/> Improve UI and performances

# References

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*Conagra Subsidiary Sentenced in Connection with Outbreak of Salmonella Poisoning Related to Peanut Butter.* US Justice Department.

<https://www.justice.gov/archives/opa/pr/conagra-subsidiary-sentenced-connection-outbreak-salmonella-poisoning-rela-ted-peanut-butter>