

**Team 9 - Product Backlog: CS407**

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**Problem Statement:**

Customers often find themselves struggling to find out whether a particular product, being either a food product or medicine, fits their dietary needs. They want to make sure the product does not have any conflict to their allergy restrictions, and want to find out fast. There are a few applications that have similar functionalities, but they are outdated and only supports old version of mobile devices with not user-friendly UX. Our app allows users to take a snap of a QR code, barcode or take a picture of the ingredient section from the product packaging to quickly identify whether the product is safe for them.

**Background Information:**

**Targeted Users :**

In the modern era, the majority of people are aware of what allergies they have due to the easy accessibility of allergy tests. However, when consuming medication or food in one’s daily life, ascertaining the safety of consuming that product becomes difficult due to many different aspects. Looking through long lists of ingredients in tiny font and researching each ingredient can be a tedious process for someone with allergies. AllergySnap aims to help users with allergies easily identify and avoid ingredients in potentially harmful products with a simple image recognition system.

**Similar Applications:**

There are a few applications that provide similar services such as AllergyEats, Shopwell, Sift Food Labels, and Food Allergy Snapper. However, many of these applications attack the problem from different angles and focus solely on food. AllergyEats provides a guide to allergy friendly restaurants based on a user’s location. Sift Food Labels and Shopwell focus more on helping users to understand food nutrition information easier. FoodAllergySnapper is not designed with a user friendly interface. The purpose of these applications align with our goals of safely and efficiently archiving product ingredient information and helping users make decisions on food and medicine.

**Limitations:**

Pre-existing applications are streamlined and work well, but they all have similar issues

guiding a user only within food categories. AllergySnapper and various food ingredient analyzing applications all perform step by step food/restaurant guide with ease, but AllergySnap take one step further bringing allergy reaction alert method that recognize the ingredient of both food and medicine and alert user when it reacts to their allergies. This allows users to utilize their smartphone to easily validate adequate intake of food and medicine.

**Environment:**

AllergySnap will be a mobile application. Users will be able to utilize the camera on their phones to take pictures of medications and food they want information about. The backend will keep track of users created by the application. The frontend UI for AllegySnap will be designed using Android Studio and XML. Google Vision API will be utilized to incorporate image-to-text processing.

**Functional Requirements:**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Function Requirement** | **Hours** | **Status** |
| 1 | As a developer, I would like to set up the development environment for front-end and back-end. | 10 | Proposed |
| 2 | As a user, I would like to Sign up | 10 | Proposed |
| 3 | As a user, I would like to Login | 10 | Proposed |
| 4 | As a user, I would like to Logout | 5 | Proposed |
| 5 | As a user, I would like to be able to login with my AllergySnap account | 10 | Proposed |
| 6 | As a user, I would like to be able to login with Google | 10 | Proposed |
| 7 | As a user, I would like to be able to login with Facebook | 10 | Proposed |
| 8 | As a user, I would like to be able to login with Twitter | 10 | Proposed |
| 9 | As a user, I would like to delete my account | 5 | Proposed |
| 10 | As a user, I would like to change my password | 10 | Proposed |
| 11 | As a user, I would like to have my own personal profile for the application | 20 | Proposed |
| 12 | As a user, I would like to edit my personal information | 20 | Proposed |
| 13 | As a user, I would like to upload an avatar/picture for my profile | 10 | Proposed |
| 14 | As a user, I would like to have a settings function | 20 | Proposed |
| 15 | As a user, I would like to be invite a friend through email | 20 | Proposed |
| 16 | As a user, I would like to be able to store personal information such as date of birth and etc when registering | 20 | Proposed |
| 17 | As a user, I would like to be able to take a picture of a barcode of a consumable and save the parsed information of that consumable | 40 | Proposed |
| 18 | As a user, I would like to be able to take a picture of a QR Code of a consumable and save the parsed information of that consumable | 40 | Proposed |
| 19 | As a user, I would like to be able to take a picture of the ingredients section of a consumable package and save the parsed information of that consumable | 50 | Proposed |
| 20 | As a user, I would like to manually input medications I’m using and have them stored in my list of medications | 30 | Proposed |
| 21 | As a user, I would like to input my allergy/personal limitations in order to filter potentially harmful consumables | 40 | Proposed |
| 22 | As a user, I would like to see if I would have an allergic reaction/personal limitation to a certain medication | 40 | Proposed |
| 23 | As a user, I would like to see if I would have an allergic reaction/personal limitation to a certain consumable | 40 | Proposed |
| 24 | As a user, I would like to see if multiple medications I am taking conflict with one another | 30 | Proposed |
| 25 | As a user, I would like to have a compiled list of harmful consumables based on inputted medications and allergies | 20 | Proposed |
| 26 | As a user, I would like to be recommended consumables to intake based off my allergies and medications **(if time allows)** | 20 | Proposed |
| 27 | As a user, I would like to be recommended medications to intake based off my allergies and medications **(if time allows)** | 30 | Proposed |
| 28 | As a user, I would like to receive alerts for intaking/receiving prescribed medication or vaccines already inputted | 40 | Proposed |
| 29 | As a user, I would like to have multiple profiles within one account for family/friends **(if time allows)** | 30 | Proposed |
| 30 | As a user, I would like to have a terms and conditions box on how my medical information is used and will have to agree to it when creating my new account. **(if time allows)** | 10 | Proposed |
| 31 | As a user, I would like to have a pollen alert, which locates where I am at, and notify me when pollen concentration is high. **(if time allows)** | 20 | Proposed |

**Non-Functional Requirements:**

* Application will be interesting, instinctive, and visually appealing user interface.
* Application will be easy to use and robust.
* Application will have pop ups if any error occurs.
* Application will have cleanly organized and well-documented code.
* Application will be maintainable and testable.
* Application will store the required information safely and securely.

**Response Time:**

AllergySnap’s response time will be affected by the process time of Google Vision API, the RESTful API implementation, and the algorithms and data structures that we will put into place. On the user’s end, the device they are using can also affect overall response time.

**Usability:**

AllergySnap will be visually appealing on android devices with a clean and modern user-interface. The design is significant because we want the users to be able to take pictures or enter information without any confusion and stress. The design will be swift and interactive, allowing for users to jump between allergy alerts and additional features. We will make sure that there is a seamless integration with Firebase so that the user can send and retrieve the information easily.

**Security:**

Security is critical for AllergySnap as the medical details stored about the user are critical to a user’s identity. As a result, we need to take steps to make sure only innocent users can access their account. Firebase is hosted on a Secure Sockets Layer and establishes an encrypted link between the user and the host. We will expatiate the Firebase rules to ensure the security of our Firebase data. When the user forgets their password we will not tell them if it was the password or username that failed the verification.The failed verification message to be displayed will be vague, for example, "Invalid username and/or password." This prevents attackers from brute-forcing valid usernames without knowing their passwords.

**Scalability:**

The system should be able to handle about 8,000 users efficiently where the system would have fast response time and bandwidth. Firebase is hosted on Google servers and this will allow for fast access as well.

**Use Cases:**

**Case 1: Open the application**

|  |  |
| --- | --- |
| *Action*  1. Download and open the application. | *System Response*  2. Application opens, takes user to Login if not logged in and Home Menu if logged in |

**Case 2: Create an account (Sign up)**

|  |  |
| --- | --- |
| *Action*  1. Input credentials to text boxes  Username must be a valid email address between 3-254 characters.  Username must not already be in use.  Password must be 8-30 characters and the password confirmation field must match. | *System Response*  2. Confirms signup, takes user to Home Menu  Otherwise displays an error message |

**Case 3: Login to account**

|  |  |
| --- | --- |
| *Action*  1. Input credentials  Username must be a valid email address between 3-254 characters.  Username must be an existing account..  Password must be 8-30 characters. | *System Response*  2. Confirms successful login  Otherwise displays an error message |

**Case 4: Logout of an account**

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| --- | --- |
| *Action*  1. Tap the logout button in navigation bar | *System* *Response*  2. User is logged out and taken back to Login |

**Case 5: Login with AllergySnap**

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| --- | --- |
| *Action*  1. User types email and password under the respective textboxes on the login page  User must exist. | *System Response*  2. System accesses user account database |

**Case 6: Login with Google**

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| --- | --- |
| *Action*  1. User clicks login with Google button  Google user must exist. | *System Response*  2. System accesses Google login api |

**Case 7: Login with Facebook**

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| --- | --- |
| *Action*  1. User clicks login with Facebook button  Facebook user must exist. | *System Response*  2. System accesses Facebook login API |

**Case 8: Login with Twitter**

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| --- | --- |
| *Action*  1. User clicks login with Twitter button  Twitter user must exist. | *System Response*  2. System accesses Twitter login API |

**Case 9: Delete account**

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| --- | --- |
| *Action*  1. Choose delete account from Profile page  3. Confirm account deletion | *System Response*  2. Open a prompt for confirmation of account deletion  4. Confirms account is deleted, takes user to login page |

**Case 10: Change password**

|  |  |
| --- | --- |
| *Action*  1. Tap change password in Profile Settings  3. Input login, current password, and new password  Username must match current user.  Old password must match current password.  New password must be 8-30 characters. | *System Response*  2. Takes user to change password page  4. Confirms current password is correct and acknowledges a new password was set  Otherwise displays an error message |

**Case 11: View personal profile**

|  |  |
| --- | --- |
| *Action*  1. Click profile in the navigation bar  User may choose to leave some fields blank. | *System Response*  2. Display user's information; e.g. age and favorite hobby |

**Case 12: Edit personal information as a user**

|  |  |
| --- | --- |
| *Action*  1. Clicks edit personal information button  3. User enters and submits form | *System Response*  2. Editing Personal Information form appears  4. System updates user database with updated information |

**Case 13: Upload images as a user**

|  |  |
| --- | --- |
| *Action*  1. Clicks upload image for profile  3. User selects where to import picture from  5. User selects image | *System Response*  2. Image upload prompt for browsing mobile device appears  4. System opens that location or application  6. System uploads image to database and updates user database |

**Case 14: Settings function in personal profile**

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| --- | --- |
| *Action*  1. Tap the settings button in the navigation bar | *System Response*  2. User is navigated to Settings |

**Case 15: Invite friend through email**

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| --- | --- |
| *Action*  1. User taps share button in Menu page  3. User inputs email into text box  Must be a valid email address | *System Response*  2. System shows user email invite page and prompts user to input email  4. System uses // to send email to target email |

**Case 16: Store personal information**

|  |  |
| --- | --- |
| *Action*  1. User inputs personal information such as date of birth and gender, etc.  If information is invalid, user is prompted | *System Response*  2. System validates information |

**Case 17: Take picture of barcode and store ingredient information**

|  |  |
| --- | --- |
| *Action*  1. User taps camera button in Menu  3. User takes picture of barcode of a consumable  If code is invalid, user is prompted | *System Response*  2. Opens camera for use  4. Information on the consumable is parsed and stored in consumables list |

**Case 18: Take picture of QR and store ingredient information**

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| --- | --- |
| *Action*  1. User taps camera button in Menu  3. User takes picture of QR of a consumable  If code is invalid, user is prompted | *System Response*  2. Opens camera for use  4. Information on the consumable is parsed and stored in consumables list |

**Case 19: Take picture of ingredients label of consumable and store relevant information**

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| --- | --- |
| *Action*  1. User taps camera button in Menu  3. User takes picture of ingredients label of consumable  If picture is invalid, user is prompted | *System Response*  2. Opens camera for use  4. Ingredient information is parsed and stored in consumables list |

**Case 20: Manually input medication in use as a user**

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| --- | --- |
| *Action*  1. User taps medication button in navigation bar  3. User taps add button  5. Input medication name, dosage, number of doses to take a day and number of days to take medication | *System Response*  2. Takes user to user’s medication list  4. User is taken to add medication page  6. Finds ingredient information and validates it  Prompts user if not found |

**Case 21: Add personal limitations**

|  |  |
| --- | --- |
| *Action*  1. User taps personal limitations button in navigation bar  3. User taps add button  5. Input personal limitation/allergies | *System Response*  2. Takes user to user’s personal limitation list  4. User is taken to add personal limitation page  6. Searches for personal limitation information and validates it  Prompts user if not found |

**Case 22: Check conflict with medication**

|  |  |
| --- | --- |
| *Action*  1. User taps Quick Search button in navigation bar  3. User searches medication | *System Response*  2. Takes user to search bar    4. Shows if user has a personal/allergic conflict with a medication  Prompts user if not found |

**Case 23: Check conflict with consumable**

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| --- | --- |
| *Action*  1. User taps Quick Search button in navigation bar  3. User searches consumable | *System Response*  2. Takes user to search bar    4. Shows if user has a personal/allergic conflict with a consumable  Prompts user if not found |

**Case 24: Medication Conflicts**

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| *Action*  1. User taps Medication Conflicts button in navigation bar | *System Response*  2. Shows user all conflicts between inputted medications |

**Case 25: List of harmful consumables to user**

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| --- | --- |
| *Action*  1. User taps Conflicts button | *System Response*  2. System shows many consumables that would be harmful for the user based on inputted medications and allergies |

**Case 26: Recommended consumables**

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| --- | --- |
| *Action*  1. User taps Recommended button in navigation bar | *System Response*  2. Shows user recommended consumables based off inputted foods, medications and inputted personal limitations |

**Case 27: Recommended medications**

|  |  |
| --- | --- |
| *Action*  1. User taps Recommended button in navigation bar | *System Response*  2. Shows user recommended medications based off inputted foods, medications and personal limitations |

**Case 28: Vaccine/Prescribed Medication Alerts**

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| --- | --- |
| *Action*  1. User inputs allergy and medication information | *System Response*  2. System alerts user when they need to take their medication/get a vaccine |

**Case 29: Adding accounts to a profile**

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| --- | --- |
| *Action*  1. Clicks add profile  3. Second user accepts invitation to join account | *System Response*  2. Request is sent to other account  4. System adds profile to account |

**Case 30: Agreement to terms and conditions**

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| --- | --- |
| *Action*  1. User clicks checkbox terms and conditions checkbox | *System Response*  2. System then allows user to sign up |

**Case 31: Pollen alerts**

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| --- | --- |
| *Action*  1. User allows application to have access to location | *System Response*  2. System alerts user when pollen concentration is high at their location |