Project Deliverable 1 – Requirements and Use Cases

System Overview

      Our application, SnapBuy, is a mobile app that allows users to take a picture of any product they desire and search for a website to buy it from. The app would recognize the general category for which the product belongs in (ex. a pair of Jordans belongs under "shoes") and find a place online where you can buy other products under the same category.

Rationale for Building System

      For the longest time, users were not able to search for a product they want by image, and they would have to comprehend the image and search for it on the web themselves. We, the developers, wanted to build an app that would solve this problem and return the product search results from the biggest online retailer/stores. Amazon has a similar functionality on their app that allows for users to take a video of a product and search for it in their database. It is not the main functionality of their app, and the results returned are from Amazon's own listings.

Methodology Used

      Requirements generation was conducted experimentally and organically with all team members present. We downloaded Amazon's app just to test out their product recognition capabilities and dissected its functionality. Functional requirements were discussed first, and conceptualized based on the high-level processing pipeline, e.g. the Input stage in the pipeline necessitates a functional requirement of picture or video recording. Non-functional requirements were determined based on prerequisites for functional requirements, as well as general usability requirements.

Functional Requirements

1. Take a Picture: SnapBuy shall include camera functionality to take pictures of objects. This requirement has the highest priority because the average user's objective relies on this feature. The goal of the app is to take pictures of objects and search for them on the web, so being able to take a picture should be the most important function.
2. Image Analysis: The second highest priority requirements involves analyzing an image and generating keywords. This function is necessary for relevance and proper operation of the following requirements. It is also key in the average user's objective.
3. Web Search: SnapBuy shall automatically search specific websites with the keywords generated from image analysis for the desired product. The app should be able to search these websites directly to pull that website's specific product information and present these product listings to the user. While this function does have high priority, it is not any higher because a user could use the keywords generated and take those to whatever

search engine they would like. This function, however, will automate the process for the user and is considered one of the main selling points for the app.

4. Website Redirection: Once the user is presented with product listings, SnapBuy shall allow the user to press on a listing to be redirected to the webpage that the listing was retrieved from. While also a very important function to the user's experience, it is not entirely necessary for the overall function of the app.
   Stretch Goals:
5. Search Refinement/Filtering: Being able to further refine and/or filter the search, users should be able to customize their search options. The rationale for this being a low priority requirement concerns the average user's workflow and development time constraints. Because the user does not need to rely on this feature to have a positive experience, and because development time may not allow for its implementation, refinement and filtering is a low priority requirement.
6. List Sort: SnapBuy could have a settings page that includes an option to sort the product list. A user could sort by price, website name, product name, or tag match. The priority of this function is low because the default sorting should already be optimized for the user. Additionally, the time to implement this function may not be feasible.

Non-functional Requirements
1. High Usability
   a. Subjective Measurement Criteria:
      i. 1-10 scale of user comfort with UI and flow
   b. Objective Measurement Criteria
      i. Time it takes a new user to successfully find a product they want to
2. Short Search and Result Generation Time
   a. Objective Measurement Criteria
      i. If a search (searches consist of Image Analysis and Web Search) for a product yields a result in five (5) seconds or less, a low search time has been achieved
3. Permissions Requirements
   a. The app will require, at a minimum, access to the device's camera in order to take pictures or videos
   b. Accomplishment of stretch goals will additionally require access to device storage in order to save pictures and videos

Use Case Descriptions

1. Use case name and identifier: U1 - Taking a picture of a product
2. Objective - User can take a picture of a product to find identical products online
3. Priority - High

4. Source - John Smith (user)
5. Actors - user, application
6. Flow of Events
    1. Basic Flow -
        i. Initiated when user opens the app
        ii. The app asks for camera permission
        iii. User gives permission to use mobile device's camera
        iv. User takes a picture of the product
        v. App returns a list of products matching the image description from different stores
    2. Alternative Flow -
        i. Initiated at step ii, the app's image recognition cannot recognize the user's picture
        ii. The app displays an error message
        iii. The user views the error message
        iv. The user is directed to take another picture
    3. Exceptions - Exceptions that may happen during the execution of the use case
        i. Initiated at step ii, user does not give permission to access camera
        ii. The application closes
7. Includes (other use case IDs)
8. Preconditions - The user has the app downloaded to their mobile device
9. Post conditions - The user will have seen buying options for the item they took a picture of
10. Notes/Issues - The store results must load within 5 seconds

1. Use case name and identifier: U2 - Access the App's Settings
2. Objective - A user can navigate to the settings to change preferences
3. Priority - High
4. Source - Jane Doe (user)
5. Actors - User, application
6. Flow of Events
    1. Basic Flow -
        i. Initiated when the user opens the app
        ii. The app asks for camera permission
        iii. User gives permission to use mobile device's camera
        iv. The user clicks the settings option
        v. The user changes the settings

      vi. The user changes the settings options
2. Alternative Flow -
      i. Initiated at step iv
      ii. The user does not change any settings
      iii. The user closes the settings option
3. Exceptions - Exceptions that may happen during the execution of the use case
      i. Initiated at step ii, user does not give permission to access camera
      ii. The application closes
7. Includes (other use case IDs)
8. Preconditions - The user has the application downloaded to their mobile device
9. Post conditions - The user has changed a settings option
10. Notes/Issues - The setting change should be saved and kept

1. Use case name and identifier - U3 - Sort by price of products returned
2. Objective - The user can choose to sort the products returned by highest or lowest price, or just by relevance
3. Priority - Medium
4. Source - John Doe (user)
5. Actors - user, application
6. Flow of Events
    1. Basic Flow -
      i. Initiated when user opens the app
      ii. Include U2: Access the App's Settings
      iii. The app asks for camera permission
      iv. User gives permission to use mobile device's camera
      v. The user clicks the setting option
      vi. The user can then choose which price options to sort by
      vii. The user closes the settings option
    2. Alternative Flow -
      i. Initiated at step v
      ii. The user does not change any settings
      iii. The user closes the settings option
    3. Exceptions -
      i. Initiated at step ii, user does not give permission to access camera
      ii. The application closes
7. Includes (other use case IDs): U2
8. Preconditions - The user has the application downloaded to their mobile device

9. Post conditions - The user has changed the price sorting option
10. Notes/Issues - The price sorting change is saved

1. Use case name and identifier: U4 - Click a product returned by the search
2. Objective - A user can click a product returned by the product image search
3. Priority - High
4. Source - Jane Smith (user)
5. Actors - User, application
6. Flow of Events
    a. Basic Flow -
        i. Initiated when user opens the app
        ii. The app asks for camera permission
        iii. User gives permission to use mobile device's camera
        iv. Includes U1- Buying a product
        v. User can then select a specific product to be redirected to the specific stores website
    b. Alternative Flow -
        i. Initiated when at step v, the user does not select any of the products returned
        ii. User can select to retake the picture of the product
    c. Exception Flow -
        i. Initiated at step ii, user does not give permission to access camera
        ii. The application closes
7. Includes (other use case IDs): U1
8. Preconditions - The user has the application downloaded to their mobile device
9. Post conditions - The user has been redirected to a store's product page
10. Notes/Issues - The redirect should happen within 5 seconds

Contributions

- George managed the work for this deliverable.
- The work was allocated based on the approximate words needed to complete each section and the amount of brain power needed.

George - System overview, Rationale, Contributions

Morgan - Functional req.

Adrian - Non-functional req., Methodology

Mike - Use case descriptions