

Deliverable #1 Template : Software Requirement Specification (SRS)

SE 3A04: Software Design II – Large System Design

Tutorial Number: T03

Group Number: G07

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IMPORTANT NOTES

- Be sure to include all sections of the template in your document regardless whether you have something to write for each or not
 - If you do not have anything to write in a section, indicate this by the *N/A*, *void*, *none*, etc.
- Uniquely number each of your requirements for easy identification and cross-referencing
- Highlight terms that are defined in Section 1.3 (**Definitions, Acronyms, and Abbreviations**) with **bold**, *italic* or underline
- For Deliverable 1, please highlight, in some fashion, all (you may have more than one) creative and innovative features. Your creative and innovative features will generally be described in Section 2.2 (**Product Functions**), but it will depend on the type of creative or innovative features you are including.

1 Introduction

1.1 Purpose

The purpose of this document is to identify software requirements, background info regarding the Shroomify product and its users, and use cases.

The intended audience for this document are the internal stakeholders on the project, such as developers, managers, executives, investors, domain experts, and anybody involved in the development of Shroomify. Note that there is no prior knowledge required.

1.2 Scope

Shroomify, the mushroom identification application will allow users to identify mushrooms based on data collected in the field while foraging. The application is expected to use three independent sources of identification called "experts". The experts are not intended to be real individuals, but rather software components that will provide identification based on user provided data.

The three experts are expected to be:

- Macro Photo Expert: This expert will use a photo of the mushroom taken using a camera to identify the mushroom. The user will be required to take a photo of the mushroom and upload it to the application. The expert based on a CNN (Convolutional Neural Network) will identify the mushroom along with a confidence score.
- Micro Photo Expert: This expert will use a photo of the mushroom taken using a microscope to identify the mushroom. The user will be required to take a photo of the mushroom under a microscope and upload it to the application. The expert based on a CNN (Convolutional Neural Network) will identify the mushroom along with a confidence score.
- Text Description Expert: This expert will use textual descriptions of the mushroom, the location of the mushroom and other relevant information to identify the mushroom using a natural language processing model (NLP). The user will be required to input the textual information into the application and the NLP model will provide an identification and confidence score.

Shroomify is not expected to provide any guarantees regarding the classification of the mushrooms, only a confidence percentage with a classification ranging from 0-100% Each expert module is expected to output a confidence probability ranging from 0.0 to 1.0 and a forum component will use each output and confidence probability to make the final decision.

If the user chooses to accept the mushroom identification outputted by the application, the application will also provide the user with a list of similar mushrooms and recipes that can be prepared using the identified mushroom.

To use the application the user is required to create an account so that the application can create a profile for the user to store their previous identifications and preferences. The user will also be able to access the application without creating an account, but the application will not store any of the user's data between app uses.

1.3 Definitions, Acronyms, and Abbreviations

- **CNN - Convolutional Neural Network:** A type of deep learning model used in image processing and computer vision tasks. It is essential for our app's image-based mushroom identification.
- **NLP - Natural Language Processing:** A field of **AI** that helps computers understand and process human language. It is useful in our app for analyzing text-based mushroom descriptions.
- **API - Application Programming Interface:** A set of protocols and tools that allow different software applications to communicate. Our app uses APIs to interact with external databases and services, such as image recognition models and recipe sources.
- **GUI - Graphical User Interface:** The visual interface through which users interact with the app. Our app provides an intuitive GUI to ensure smooth user experience.
- **VR - Virtual Reality:** A technology that creates an immersive digital environment. While not a core feature of our app, VR could be used for educational or training purposes related to mushroom identification.
- **AR - Augmented Reality:** A technology that overlays digital information onto the real world. Future enhancements of our app could incorporate AR to provide real-time mushroom identification in the field.
- **GPS - Global Positioning System:** A navigation system that provides location data. Our app can use **GPS** to tag the locations where users find mushrooms, helping track collection spots.
- **BE - Business Event:** A significant occurrence that affects business processes. In our app, a business event could be a user identifying a mushroom, saving it, or sharing it with the community.
- **VP - Viewpoint:** A perspective from which system requirements and design are considered. Different viewpoints in our project include those of regular users, researchers, and foragers.
- **UI - User Interface:** The design and layout of the app that enables user interaction. Our app ensures a clean UI to enhance usability.
- **UX - User Experience:** The overall experience users have while interacting with the app, including ease of use and satisfaction. Our app focuses on optimizing UX by providing seamless navigation, accessibility, and engaging features.
- **RMSE - Root Mean Square Error:** A statistical measure used to evaluate the accuracy of predictive models by calculating the square root of the average squared differences between predicted and actual values. In our app, RMSE can be used to assess the accuracy of the mushroom recognition model.
- **AI - Artificial Intelligence:** The field of computer science focused on creating systems that can perform tasks requiring human intelligence, such as learning, reasoning, and problem-solving. Our app uses AI for mushroom identification and classification.

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1.5 Overview

Section 2 will be discussing the overall product description and describe the general factors that affect the product. This will include product perspective and functions, user characteristics, assumptions and dependencies, and apportioning of requirements. Section 3 includes a Use Case Diagram for the scenario of identifying a mushroom in the wild. Section 4 highlights the function requirements and specifies all the uses cases by their Business Events. Section 5 will then move on to Non-Functional requirements, discussing look and feel, usability and humanity, performance, security, and cultural and political requirements. Finally, section A contains a division of labour.

2 Overall Product Description

2.1 Product Perspective

Shroomify is a mobile mushroom identification app that allows users to submit a text description, macro photo, or micro photo of a mushroom and get detailed information on it. It will function similarly to Google Lens which lets users identify objects with their camera, but it will be specifically tailored to fungi allowing for more accuracy. The product will use state of the art machine learning-based services to determine the species. Location data will be used to narrow down the results, allowing for more accuracy. Users will have a profile where they can save their mushrooms.

The system will interact with Plant.id’s identification api and an NLP in order to determine the specific fungi and if it is edible. It will be clarified to the user that they are only to consume the mushrooms at their own risk. If the mushroom is determined to be edible, the product will recommend recipes the user can cook using said mushroom.

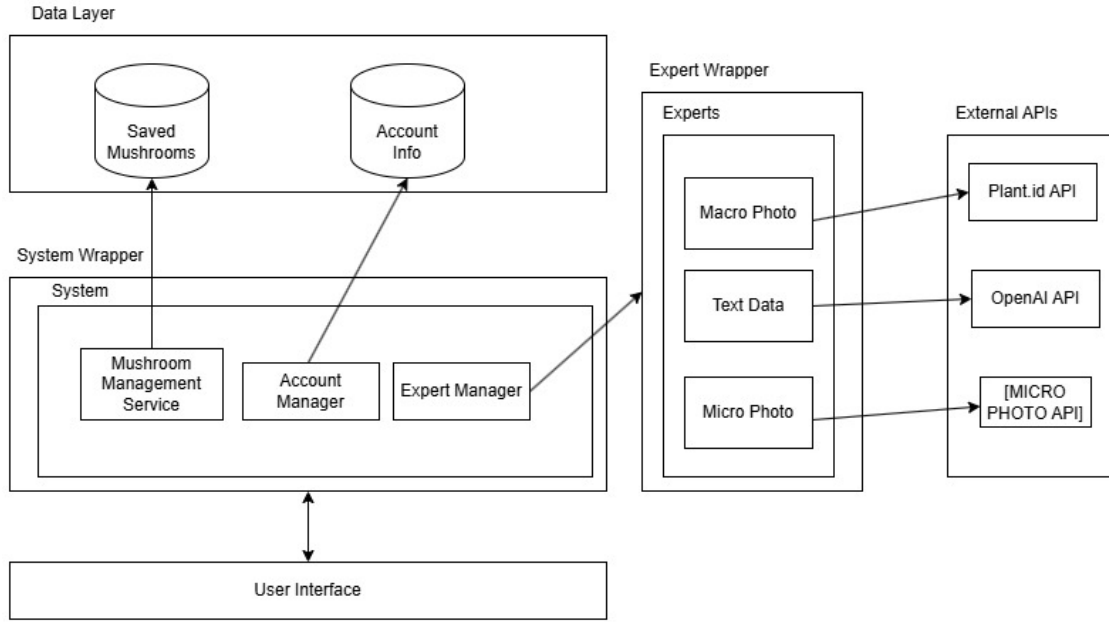


Figure 1: System Diagram.

2.2 Product Functions

Modules	Functions
Decision Forum	<ul style="list-style-type: none"> • Mushroom Identification: The decision forum shall poll experts based on inputs provided to attempt to identify a mushroom. • User Input: The decision forum shall accept three user inputs - a macro photo, a micro photo, and a text description and validate the inputs. • Voting: The decision forum shall poll the experts and output a final decision based on the expert's outputs and confidence probabilities.
Account Manager	<ul style="list-style-type: none"> • Account creation: The account manager shall allow users to register and create an account. • Account deletion: The account manager shall allow users to delete their account. • Account modification: The account manager shall allow users to modify their account. • Account login/logout: The account manager shall allow users to login and logout of their account.
Recipe Recommender	<ul style="list-style-type: none"> • Recipe Identification: The recipe recommender shall recommend a list of recipes based on the identified mushroom. • Recipe Filtering: The recipe recommender shall allow users to filter the list of recipes based on dietary restrictions. • Recipe Favoriting: The recipe recommender shall allow users to favorite recipes.

Table 1: Product Functions

2.3 User Characteristics

General characteristics of the intended users of the product:

1. Education Level: Basic Literacy required
 - Users with the ability to read, write, and comprehend simple instructions should face no problems using the app.
2. Experience: No prior experience required
 - First-time users should be able to navigate without difficulty, as the app is assumed to be user-friendly.
3. Technical Expertise: Familiarity with touchscreen devices
 - Users with basic knowledge of touchscreen interactions, such as swiping, tapping, and typing, should have no issues using the app.

2.4 Constraints

- **Time Constraints:** The timeline constraints placed by developers and stakeholders will affect the outcome of the product as it limits resources and development time.
- **Budget Constraints:** The project budget of \$0 limits the technologies the developers can use since certain APIs or resources cost money to use.
- **Device Constraints:** The device of a typical user must be considered as the computing power and RAM usage will be limited for our app.
- **Storage Constraints:** Depending on how much data is stored, there may be limitations on the amount of data that can be stored on a user's device or online.

2.5 Assumptions and Dependencies

Assumptions made while interpreting what the software being developed aims to achieve.

1. The function of identifying a mushroom is different from discovering the different types of mushrooms.
2. ~~Innovative feature 1: The user can collect mushrooms. When they identify one, it's saved to their account as a collect~~
3. ~~Innovative feature 2: After the user has found an edible mushroom, they can find recipes for it.~~
4. Assume "Identify Mushroom using photo" implies displaying the camera app to take a picture.
5. The app will only be used in Canada.

Other assumptions that, if it fails to hold, could require a change to the requirements:

1. The product shall have uninterrupted access to an internet connection.
2. Assume that users have granted all necessary permissions for the app to function properly.
3. Assume that third-party libraries and dependencies remain compatible with future updates.
4. Assume that APIs remain compatible with future updates.

2.6 Apportioning of Requirements

- **Varying Language Options:** The initial version of the app only supports English; however, in the future, additional language options will be implemented to create a more inclusive environment for a broader user base.
- **Offline Usage:** The initial release of the application will require an internet connection to identify mushrooms. Future versions may include an offline identification feature, allowing users to access identification tools without being connected to an internet network.
- **VR/AR for Mushroom Identification:** In the initial release, the app will rely on macro and micro photos for identification, with users being presented with a new screen of information regarding the identified mushroom. A future update may include augmented reality (AR) functionality that overlays information about mushrooms directly onto the camera's view in real time.
- **Competitive Gameplay:** While the initial version focuses on individual mushroom identification, future updates may include competitive gaming features to create a more engaging experience for users. This could be implemented with a leaderboard ranking users based on the number of mushrooms identified or rare mushroom discoveries.

3 Use Case Diagram

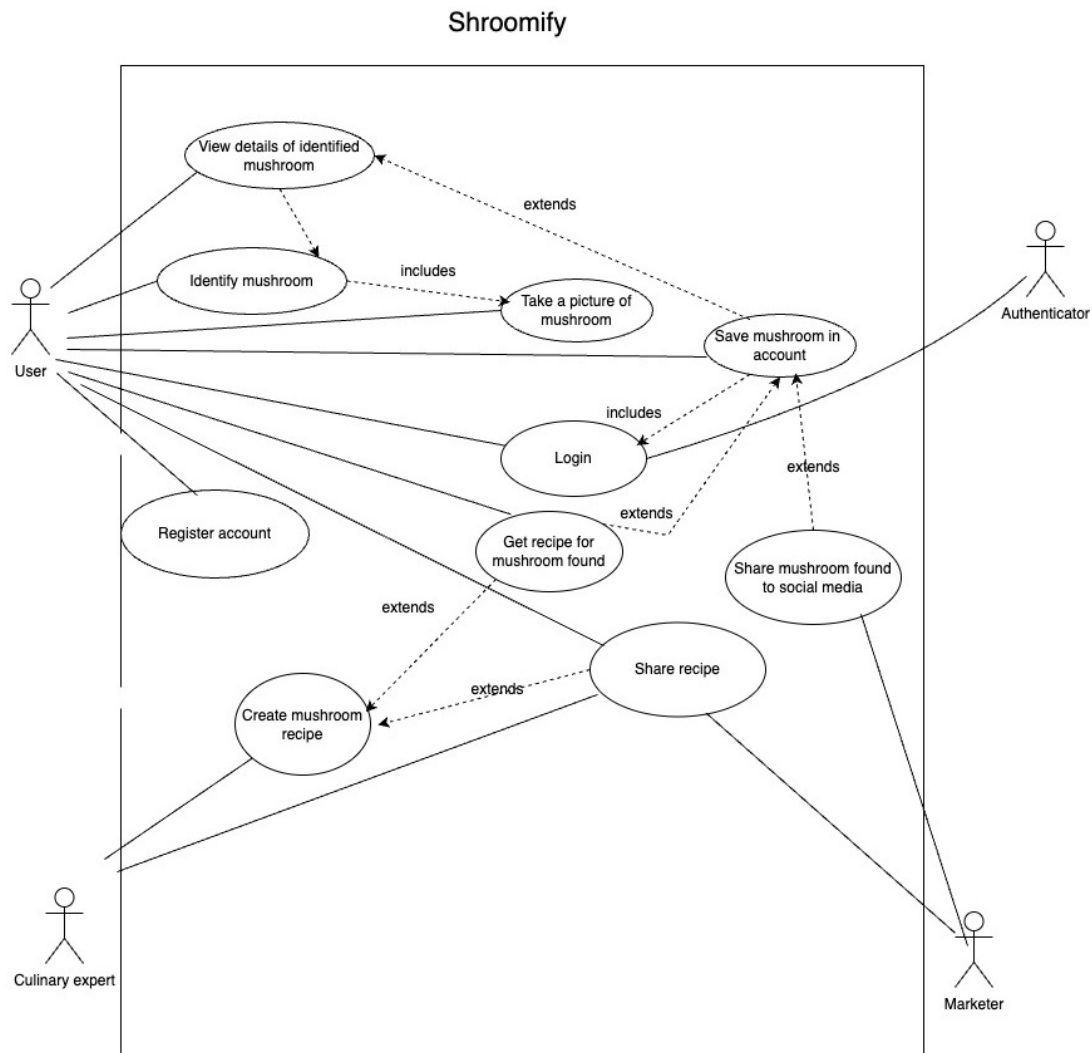


Figure 2: Use Case Diagram for Shroomify.

4 Highlights of Functional Requirements

Main Business Events:

- BE1: Identify a mushroom.
- BE2. Save Mushroom to Profile.
- BE3. Recipe Recommendation.
- BE4. Sharing on Social Media.
- BE5. Account Registration.
- **BE6. User Login.**

Viewpoints:

- VP1: User
- VP2: External Providers
- VP3: Marketing
- VP4: Mycologist (Fungi expert)
- VP5: Culinary Expert

BE1. Identify a mushroom.

Pre-condition: User has the app opened and has completed initial app setup.

VP1. User #1

Main Scenario:

1. The user accesses the **Mushroom Identification** page.
2. The user selects the option to **upload images** for identification.
3. The system displays all available images from the device's gallery.
4. The user selects and confirms the **macro** (overall appearance) and **micro** (detailed features) images of the mushroom.
5. The system verifies whether the selected images are valid and usable.
6. If valid, the system uploads the images to the **Macro & Micro Image Identification Expert** and displays a confirmation checkmark.
7. The user selects the option to provide additional **textual information** for identification.
8. The system presents a structured **identification form**.
9. The user inputs a **description** of the mushroom along with its **GPS location**.
10. The system verifies the submitted information and uploads it to the **Textual Identification Expert**.
11. The user initiates the **mushroom identification process**.
12. final decision is reached, the system displays the **identification result** along with the **confidence probability**.

VP2. External Provider

1. The external system receives an image upload request.
2. System begins transferring images for the image based experts.
3. System sends back upload complete and successful message to client.
4. System receives a completed form to store.
5. System sends back success message to client.
6. System receives a request to start identification process.
7. System validates inputs provided and starts the identification process.
8. Once the decision forum reaches a final decision, the system sends the results to the client.

VP3. Marketing

N/A

VP4. Mycologist

1. Mycologist wants to ensure an overall decision system accuracy rate.

VP5. Culinary Expert

N/A

Post condition: User has received mushroom identification results with a confidence level.

Global Scenario:

1. The user accesses the **Mushroom Identification** page.
2. The user selects the option to **upload images** for identification.
3. The system displays all available images from the device's gallery.
4. The user selects and confirms the **macro** (overall appearance) and **micro** (detailed features) images of the mushroom.
5. The system verifies the selected images for validity and usability.
6. If valid, the system uploads the images to the **Macro & Micro Image Identification Expert**.
7. The **External Provider System** receives the image upload request.
8. The external system processes and transfers the images for expert analysis.
9. Upon successful upload, the external system sends a confirmation message to the client.
10. The system displays a confirmation indicator to the user.
11. The user selects the option to provide additional **textual information** for identification.
12. The system presents a structured **identification form**.
13. The user inputs a **description** of the mushroom along with its **GPS location**.
14. The system verifies the submitted information and uploads it to the **Textual Identification Expert**.
15. The **External Provider System** receives and stores the submitted form.
16. A confirmation message is sent to the user upon successful submission.
17. The user initiates the **mushroom identification process**.
18. The **External Provider System** receives the request and begins processing.
19. The system validates the provided images and textual inputs before proceeding.
20. Identification results undergo additional validation based on heuristics provided by a **Mycologist**.
21. Once a final decision is reached, the system sends the **identification results** to the user along side with the confidence probability.

BE2. Save Mushroom to Profile #2

Pre-condition: The user is logged in and viewing a mushroom identification result.

VP1. User #1

Main Success Scenario:

1. System displays the mushroom identification result with a "Save to Profile" option.
2. User selects the "Save to Profile" option.
3. Mushroom data is sent to the Database for storage.
4. System updates the user's profile with the mushroom information and displays a confirmation message.

Secondary Scenario:

- 2i. The system fails to update the user profile with the mushroom information.
 - 2i.1 The system attempts to retry the update operation.
 - 2i.2 If the retry fails, the system displays an error message indicating that the save operation was unsuccessful.

- 3i. Database fails to upload the Mushroom Information.
 - 3i.1 The system attempts to retry the database upload.
 - 3i.2 If unsuccessful, the system displays an error message indicating that the database upload failed.

VP2. External Services (Database/API) #2

- 3i. Database error message is received, logged, and troubleshooted.

VP3. Customer Support #3

- 2i. System should prompt an error page with suggestions to retry the operation or provide a link to contact customer support.

VP4. Marketing #4

N/A

VP5. Mushroom Expert #5

N/A

Global Scenario:

Pre-condition: The user is logged in and a mushroom identification result is available.

Main Success Scenario:

- 1. System displays the mushroom identification result with a “Save to Profile” option.
- 2. User selects the “Save to Profile” option.
- 3. Mushroom data is sent to the Database for storage.
- 4. System updates the user’s profile with the mushroom information and displays a confirmation message.

Secondary Scenario:

- 2i. The system fails to update the user profile with the mushroom information.
 - 2i.1 The system attempts to retry the update operation.
 - 2i.2 If the retry fails, the system displays an error message indicating that the save operation was unsuccessful.
- 3i. Database fails to upload the Mushroom Information.
 - 3i.1 The system attempts to retry the database upload.
 - 3i.2 If unsuccessful, the system displays an error message indicating that the database upload failed.

BE3. Recipe Recommendation

Pre-condition: User has identified a mushroom and it is classified as safe for consumption. The user has an active account.

VP1. VP1: User #1

Main Success Scenario

- 1. User navigates to the Recipe Recommendation page.
- 2. System checks if the identified mushroom is edible.
- 3. System fetches curated recipes that involve the identified mushroom.
- 4. System displays a list of recipe options with preparation details and ingredient lists.

5. User selects a recipe to view cooking steps in detail.
6. System provides step-by-step cooking instructions along with safety tips.
7. User has the option to save the recipe for later or share it with others.

Secondary Scenario

- 3i. No recipes found for the mushroom.
 - 3i.1 System notifies the user that no recipes are available.
 - 3i.2 System suggests searching for other edible mushrooms.
- 4i. User selects a recipe, but the link is broken.
 - 4i.1 System displays an error message and offers alternative recipes.
- 5i. Mycologist reports an error in mushroom classification.
 - 5i.1 System removes the recipe and warns the user.

VP2. VP2: External Provider #2

Main Success Scenario

1. External system provides API data for recipes.
2. System fetches and updates recipe recommendations.

Secondary Success Scenario

- 1i. External system API is unavailable.
 - 1i.1 System notifies the user that recipe recommendations cannot be updated.
 - 1i.2 System suggests trying again later or browsing previously saved recipes.
- 2i. External system returns incomplete or invalid data. previously saved recipes.
 - 2i.1 System logs the error and excludes incomplete data from the recommendations.
 - 2i.2 System notifies the user of potential missing recipes and offers existing curated options.

VP3. VP3: Marketing #3

Main Success Scenario

1. User has the option to share the recipe with others through social media.

Secondary Success Scenario

- 1i. System fails to connect to the selected social media platform.
 - 1i.1 System notifies the user of the issue and suggests trying again later.

VP4. VP4: Mycologist #4

Main Success Scenario

1. Mycologist ensures that the system only recommends safe mushrooms.
2. System updates recommendations based on the mycologist's approval.

Secondary Success Scenario

- 1i.1 Mycologist identifies a misclassified mushroom.
- 1i.2 System removes the related recipes and notifies users who saved or interacted with them.

VP5. VP5: Culinary Expert #5

Main Success Scenario

1. Culinary expert curates and verifies the quality of recommended recipes.

Secondary Success Scenario

- 1i.1 Culinary expert curates and verifies the quality of recommended recipes.
- 1i.2 System removes the flagged recipe and notifies the users who saved or interacted with it.

Post-condition:

- User has successfully found a recipe and received cooking steps.

Global Scenario:

Pre-condition: User has identified a mushroom and it is classified as safe for consumption. The user has an active account.

1. User navigates to the Recipe Recommendation page.
2. System verifies if the mushroom is safe to eat.
3. System retrieves a list of appropriate recipes.
4. User selects a recipe and follows the cooking instructions.
5. System records user interactions for future recipe recommendation improvements.

BE4. Sharing on Social Media #4**Pre-Condition:**

The user has successfully identified a mushroom using the application. The user has an account and has access to at least one social media platform.

VP1. User #1**Main Success Scenario**

1. The user selects the "Share on Social Media" option after identifying an object.
2. The system displays a list of supported platforms (e.g., Facebook, Instagram).
3. The user selects a preferred platform for sharing.
4. The system requests authentication if the user is not already logged in.
5. Upon successful authentication, the system submits the post to the selected platform.
6. The system generates an auto-formatted post, including an image, object details, and a brief description.
7. The user customizes the post by adding a caption, hashtags, or tagging friends.
8. The user submit the post to be shared.
9. The user receives confirmation that the post was successfully shared.

Secondary Scenario

- 4i. System fails to authenticate the user.
 - 4i.1 The authentication process fails due to incorrect credentials.
 - 4i.2 The system prompts the user to retry or reset their password.
 - 4i.3 If multiple failed attempts occur, the system suggests contacting support.
- 5i. System fails to connect to the selected social media platform.
 - 5i.1 The API request is rejected due to platform downtime or permission errors.
 - 5i.2 The system informs the user and suggests alternative sharing options.
 - 5i.3 The system saves the post in a queue to retry later.
- 7i. User enters invalid post content.
 - 7i.1 The system detects restricted words or prohibited content.
 - 7i.2 The system notifies the user and requests modifications.
 - 7i.3 The user edits the post and resubmits it.

VP2. External Providers (Social Media Platforms and APIs) #2**Main Success Scenario**

1. The system sends a post request to the selected social media platform's API.
2. The external provider validates the request for format and compliance.

3. The platform processes and schedules the content for posting.
4. The provider returns a success response confirming the post is published.
5. The platform allows users to interact with the post through likes, comments, and shares.
6. The system logs the response for future tracking and analytics.

Secondary Scenario

- 1i. System fails to connect to the selected social media platform.
 - 1i.1 The API request is rejected due to platform downtime or permission errors.
 - 1i.2 The system informs the user and suggests alternative sharing options.
 - 1i.3 The system saves the post in a queue to retry later.

VP3. Marketing #3

Main Success Scenario

1. The marketing team tracks user engagement metrics on social media.
2. The system collects data on shared posts, including reach, impressions, and interactions.
3. The team analyzes the data to understand sharing trends and user demographics.
4. Insights are used to optimize promotional strategies and improve app visibility.
5. The marketing team develops targeted campaigns encouraging more social sharing.
6. Influencers or key users with high engagement are identified for potential collaborations.

Secondary Scenario

- 2i. The system fails to track user engagement data accurately.
 - 2i.1 The system fails to collect data on shared posts, including reach, impressions, and interactions.
 - 2i.2 The analysis process is impacted due to incomplete or inaccurate data.
 - 2i.3 Insights derived from the engagement metrics are unreliable, leading to ineffective promotional strategies.
 - 2i.4 The marketing team identifies the issue and implements corrective actions, such as refining data collection mechanisms or integrating third-party analytics tools.

VP4. Fungi Expert #4

Main Success Scenario

1. A fungi expert discovers a shared post related to an identified mushroom.
2. They verify the accuracy of the identification using the provided details.
3. They engage by commenting with additional information.
4. The expert shares related educational content to increase public knowledge.
5. If necessary, they report misinformation to the app's support team.

Secondary Scenario

- 3i. Fungi expert fails to engage with the post.
 - 3i.1 The expert's comment fails to post due to restricted words or prohibited content.
 - 3i.2 The system flags the comment as potentially violating community guidelines.
 - 3i.3 The expert is prompted to edit and resubmit the comment.
- 4i. The expert encounters difficulties sharing educational content.
 - 4i.1 The content-sharing feature malfunctions or experiences downtime.
 - 4i.2 The system informs the expert and suggests retrying later.
 - 4i.3 The expert is given the option to save the content as a draft.
- 5i. The misinformation report submission fails.
 - 5i.1 The report submission does not go through due to a system error.

- 5i.2 The expert is notified and given the option to retry.
- 5i.3 The system saves the report and automatically resubmits it later.

VP5. Cooking Expert #5

Main Success Scenario

- 1. A cooking expert finds a shared post about an edible mushroom.
- 2. They verify the information to ensure it is correctly identified as safe.
- 3. The expert engages by suggesting cooking methods or preservation techniques.
- 4. They share additional culinary content, such as recipes or food pairings.
- 5. If the mushroom has unique nutritional benefits, they highlight its value.
- 6. The expert may reshare the post to food communities to expand reach.

Secondary Scenario

- 3i. Cooking expert fails to engage with the post.
 - 3i.1 The expert's comment fails to post due to restricted words or prohibited content.
 - 3i.2 The system flags the comment as potentially violating community guidelines.
 - 3i.3 The expert is prompted to edit and resubmit the comment.
- 4i. The expert encounters difficulties sharing educational content.
 - 4i.1 The content-sharing feature malfunctions or experiences downtime.
 - 4i.2 The system informs the expert and suggests retrying later.
 - 4i.3 The expert is given the option to save the content as a draft.

Global Scenario:

Pre-Condition:

The user has successfully identified a mushroom within the application. The user has an account and has access to at least one social media platform.

Main Success Scenario

- 1. The user selects the **Share on Social Media** option after identification.
- 2. The system prompts the user to log in (if not already authenticated).
- 3. The user enters their account credentials.
- 4. The system authenticates the user.
- 5. The system provides sharing options, including supported social media platforms.
- 6. The user selects a preferred platform for sharing.
- 7. The system generates an auto-formatted post containing an image, object details, and a description.
- 8. The user customizes the post with a caption, hashtags, or tagged friends.
- 9. The system sends the post request to the selected social media platform's API.
- 10. The external platform processes the request and publishes the post.
- 11. The system confirms successful sharing and notifies the user.

Secondary Scenario

- 4i. System fails to authenticate the user.
 - 4i.1 The authentication process fails due to incorrect credentials.
 - 4i.2 The system prompts the user to retry or reset their password.
 - 4i.3 If multiple failed attempts occur, the system suggests contacting support.
- 8i. User enters invalid post content.
 - 8i.1 The system detects restricted words or prohibited content.

- 8i.2 The system notifies the user and requests modifications.
- 8i.3 The user edits the post and resubmits it.

- 9i. System fails to connect to the selected social media platform.
- 9i.1 The API request is rejected due to platform downtime or permission errors.
- 9i.2 The system informs the user and suggests alternative sharing options.
- 9i.3 The system saves the post in a queue to retry later.

Post-Condition:

The user receives a confirmation message indicating that the post was published.

BE5. Account Registration

Pre-condition: User does not have an existing account and the app is installed on their device.

VP1. User #1

Main Success Scenario

1. User navigates to the Sign-Up page.
2. System prompts the user to enter required details:
 - Full Name
 - Email Address
 - Password
 - (Optional) Location for improved mushroom identification accuracy.
3. User enters details and presses “Create Account.”
4. System verifies the input:
 - Checks if the email is valid.
 - Ensures the password meets security requirements.
 - Confirms the email is not already in use.
5. System creates the account and sends a verification email.
6. User verifies their email by clicking the confirmation link.
7. System activates the account and redirects the user to the home page.

Secondary Scenario

- 3i. User enters an invalid email format.
 - 3i.1 System prompts the user to enter a valid email.
- 3ii. Password does not meet security requirements.
 - 3ii.1 System displays password guidelines.
- 4i. Email is already registered.
 - 4i.1 System suggests the user logs in instead.
- 5i. User does not receive verification email.
 - 5i.1 System allows resending the verification email.
- 6i. User does not verify the email.
 - 6i.1 System reminds the user after 24 hours.

VP2. External Provider #2

Main Success Scenario

1. External provider handles authentication services.
2. System grants the user access to the application features.

Secondary Scenario

- 1i. External provider fails to authenticate the user.

- 1i.1 System notifies the user of the issue and suggests retrying or resetting their password.

VP3. Marketing #3

N/A

VP4. Customer Support #4

N/A

VP5. Customer Success #5

Main Success Scenario

- i. Displays customer satisfaction form.

Secondary Scenario

- 1i. System fails to load the customer satisfaction form.
- 1i.1 System notifies the user of the issue and suggests retrying later.
- 1i.2 System logs the error for troubleshooting and provides an alternative feedback option (e.g., email support).

Global Scenario:

- 1. User navigates to Sign-Up.
- 2. System prompts the user to enter details.
- 3. User submits their information.
- 4. System validates the input.
- 5. System creates the account and sends a verification email.
- 6. User verifies the email and logs in.
- 7. System activates the account and grants access.

Post-condition: User successfully registers and verifies their account.

BE6. User Login

Pre-condition: User has an existing account and the app is installed on their device.

VP1. User #1

Main Success Scenario

- 1. User opens the app.
- 2. System prompts the user to enter required details:
 - Email Address
 - Password
- 3. User enters details and presses “Login”
- 4. System verifies the input:
 - Checks if the email is valid.
 - Finds account with matching email.
 - Verifies the password for the account.
- 5. System approves user login.

Secondary Scenario

- 3i. User enters an invalid email format.
 - 3i.1 System prompts the user to enter a valid email.
- 4i. Email is not found in account database.
 - 4i.1 System alerts the user that their account was not found.
- 4ii. Password does not match the account.
 - 4ii.1 System prompts the user to re-enter their password.
- 5i. System fails to approve user login.
 - 5i.1 System notifies the user that their login was unsuccessful.

5i.2 System suggests retrying or resetting their password.

5i.3 System suggests contacting customer support.

VP2. External Provider #2

N/A

VP3. Marketing #3

N/A

VP4. Customer Support #4

Main Success Scenario

1. User contacts customer support.
2. System connects user with customer support agent.
3. System facilitates communication between user and agent.
4. User receives assistance from customer support.
5. User logs in after issue resolution.

VP5. Customer Success #5

N/A

Post-condition: User successfully logs in and gains access to their account.

5 Non-Functional Requirements

5.1 Look and Feel Requirements

5.1.1 Appearance Requirements

LF-A1. The system shall maintain a consistent theme and branding across all interfaces.

Rationale: The system shall use a color scheme, fonts, and icons that align with the app's theme to ensure visual consistency and reinforce brand identity. [1]

LF-A2. The system shall provide a minimalist and uncluttered interface to enhance user experience.

Rationale: The design should avoid excessive elements, providing a clean layout that allows users to focus on identification and information retrieval without distractions.[2]

LF-A3. The system shall ensure clear visual differentiation of elements for improved usability.

Rationale: Buttons, menus, and icons must have distinct shapes, sizes, or colors to improve accessibility and prevent user confusion.

LF-A4. The system shall support high-quality image display without distortion or loss of detail.

Rationale: Since users rely on macro and micro photos for identification, the app must support high-resolution image uploads and clear previews.

LF-A5. The system shall offer both dark and light mode options for user preference and accessibility.

Rationale: The system should offer both dark and light modes to accommodate different user preferences and enhance readability in various lighting conditions.[3]

5.1.2 Style Requirements

LF-S1. The system shall implement a responsive design to ensure compatibility across various devices.

Rationale: Device screens vary in shape and size, so the application should be designed to adapt to all screen dimensions.

- LF-S2. The system shall provide intuitive navigation and a consistent layout for a seamless user experience.
Rationale: Menus, buttons, and features should be positioned consistently to help users quickly understand the interface and navigate efficiently.
- LF-S3. The system shall support accessibility features for users with visual impairments to enhance inclusivity.
Rationale: The system should follow accessibility standards, including scalable text, color contrast adjustments, and screen reader compatibility.[4]
- LF-S4. The system shall display loading indicators and feedback messages to inform users of system status.
Rationale: Users must receive immediate feedback when uploading images, processing identifications, or sharing posts to ensure smooth interaction.
- LF-S5. The system shall incorporate smooth animations and transitions to improve visual appeal and usability.
Rationale: The app should use subtle animations for actions like screen transitions and button presses to enhance the user experience without causing delays.

5.2 Usability and Humanity Requirements

5.2.1 Ease of Use Requirements

- UH-EOU1. The system should be operable with just one hand.
Rationale: Users often find themselves in situations where only one hand is free. Ensuring one-handed usability allows them to interact with the app even in those moments.
- UH-EOU2. The system shall adhere to usability standards, such as ISO 9241-11, to ensure that users can easily navigate and interact with the app. [5]
Rationale: Adhering to established usability standards like ISO 9241-11 ensures that the app is user-friendly and accessible to a wide range of users, including those with varying levels of technical expertise.
- UH-EOU3. The system shall provide aural and haptic feedback to the user when they interact with the user interface.
Rationale: Aural and haptic feedback enhance user interaction by providing immediate confirmation of actions. This helps reduce uncertainty, making the interface more intuitive and responsive. Additionally, it improves accessibility for users with visual impairments by offering alternative sensory cues for navigation and interaction.[6]

5.2.2 Personalization and Internationalization Requirements

- UH-PI1. The system should be designed for easy use by both right-handed and left-handed users.
Rationale: Users have personal preferences for using their phone with either hand, so the system should be comfortable regardless of hand choice. Additionally, there are situations where users may be unable to use a specific hand. If the application is optimized for only one hand, it may feel awkward and difficult to use in such cases.[7]
- UH-PI2. The system should remain functional at lower device brightness levels.
Rationale: Users do not always keep their device at full brightness. If the system becomes difficult to use in low-brightness settings, it may lead to a frustrating user experience.
- UH-PI3. The system shall utilize localization features of the chosen development framework to allow easy translation of UI strings.

Rationale: Proper localization allows the application to adapt seamlessly to different languages and regional formats. This enhances usability for a diverse user base and increases its appeal in international markets.[8]

- UH-PI4. The account manager shall allow users to create accounts with names in different languages. Passwords, however, must be alphanumeric and in English.

Rationale: Users may prefer to create their accounts using their native language rather than being restricted to a single language. This approach also supports compliance with international laws. However, since passwords are critical for security, they must be in English and alphanumeric to ensure consistency and safety.

5.2.3 Learning Requirements

- UH-L1. The application shall be designed in line with their respective platform(s) guidelines (e.g Android, iOS) to feel familiar to other apps on the same platform.

Rationale: Google and Apple provide design guidelines and UI toolkits to make apps on their platforms feel familiar. The development should utilize these toolkits and technologies to create a familiar experience which should help reduce the learning time required for the application.

- UH-L2. The **system** shall provide a tutorial to the user on the first time usage of the application. The user can start the tutorial at anytime after the first usage if required.

Rationale: Modern applications often provide tutorials on how to use the user interface to perform specific actions to familiarize the user with the functionality of the app.

5.2.4 Understandability and Politeness Requirements

- UH-UP1. The app shall offer polite, context-aware hints to guide users through the interface when assistance is needed.

Rationale: Framing hints in a clear and courteous manner improves understandability and ensures that users feel respected and supported. This approach not only reduces the learning curve for new users but also encourages a positive interaction with the application.

- UH-UP2. Any icons used in the system should be easily recognizable by users or simple to learn.

Rationale: Icons that are universally understood or quick to grasp will help users more easily comprehend the functionality of the system.

5.2.5 Accessibility Requirements

- UH-A1. The app shall adhere to accessibility guidelines provided by frameworks such as WCAG (Web Content Accessibility Guidelines) and W3C Web Accessibility Interface (WAI). [9][10]

Rationale: Frameworks for accessibility offer a comprehensive checklist and guide for creating accessible apps. They also ensure a uniform accessibility experience across multiple applications.

- UH-A2. The system should be compatible with accessibility screen readers.

Rationale: Users with vision or comprehension disabilities often rely on screen readers to navigate devices and applications. To ensure the system is accessible to these users, it must be designed to work well with common screen readers.

- UH-A3. The system should be accessible to users with color blindness.

Rationale: With approximately 300 million people affected by color blindness, it's important to design the interface in a way that ensures these users are not excluded from the experience.[11]

5.3 Performance Requirements

5.3.1 Speed and Latency Requirements

PR-SL1. The system’s decision forum shall provide an identification of the mushroom in less than 15 seconds of the initiation of the process.

Rationale: User’s expect modern applications to be responsive and fast. For every extra second that the detection takes, the concern of the application not responding rises and users are likely to abandon the interaction or log off the app as shown by research.[12]

PR-SL2. File uploads to the system’s detector agents shall takes less than 45 seconds for a standard 720P PNG image on a 20 mb/s minimum connection speed.

Rationale: Ensuring a fast upload speed minimizes the delay before the image begins processing, thereby contributing to an overall responsive system. This requirement accounts for network variability while guaranteeing a smooth user experience by reducing user wait times.[13]

5.3.2 Safety-Critical Requirements

PR-SC1. N/A.

5.3.3 Precision or Accuracy Requirements

PR-PA1. The accuracy of the macro and micro image detectors used shall be measured to be greater than 85% indepdently when using the **RMSE** loss function.

Rationale: Ensuring that the macro and micro image detectors each achieve an accuracy greater than 85% is vital, as it minimizes the chance of misclassification at the individual module level. This level of performance helps prevent error propagation when their outputs are later integrated in the decision forum.

PR-PA2. The final decision of the forum shall be accurate with a precision of greater than 90% when using the **RMSE** loss function.

Rationale: High identification accuracy is crucial for building user trust and ensuring reliable mushroom identifications. This higher threshold compensates for any minor discrepancies from the individual detectors, thereby delivering a more robust and dependable overall result.

PR-PA3. The confidence score of each expert’s prediction must be displayed alongside the result.

Rationale: As multiple experts contribute their input, some may have higher confidence in their predictions than others. Displaying these confidence scores enables users to make more informed decisions rather than blindly relying on the system.

5.3.4 Reliability and Availability Requirements

PR-RA1. The system must automatically detect external API failures to prioritize internal processing and inform users of any limited functionality.

Rationale: Relying on third-party APIs can create potential failure points. A fallback mechanism ensures that essential features, like image recognition and classification, continue to function while users receive clear notifications instead of vague error messages. This improves system resilience and prevents a total failure if an API becomes slow or unresponsive. [14]

PR-RA2. The system and its detection agents should be capable of processing 160 user requests per hour without failure.

Rationale: The goal of handling 160 requests per hour is based on the assumption of two primary servers with a distributed load balancing system. Each server should respond to requests within

45 seconds, which allows for 80 requests per hour per server, totaling 160 requests per hour for the entire system. AWS services can support this capacity, ensuring consistent performance, with the system load expected to decrease during maintenance periods. [15]

PR-RA3. The system shall notify users 1 week in advance if there are any expected maintenance outages in the future.

Rationale: Users may plan foraging trips around being able to use the app and should therefore be informed in advance if any application maintenance outages are expected to allow them to make alternative plans.

PR-RA4. The system shall have a backup server available to switch over to when maintenance is being performed on the main server.

Rationale: Having a backup server that the system can switch to during maintenance on the main server will allow an increased uptime for the whole service. It will also help prevent catastrophic system failure in case a maintenance update causes system failure on the main server.

5.3.5 Robustness or Fault-Tolerance Requirements

PR-RFT1. The system must recognize invalid, corrupted, or unsupported image uploads and provide users with helpful instructions.

Rationale: Users might upload incorrect file types, large images, or corrupted files, which can cause identification failures.

5.3.6 Capacity Requirements

PR-C1. The system must be capable of storing at least 0.5 million images, each averaging 10MB in size.

Rationale: As user activity increases, a scalable storage solution is crucial to ensure that historical searches remain accessible. Cloud storage options like AWS S3 or Google Cloud Storage should be considered for their cost-effective scalability, which can support growth without sacrificing performance.

5.3.7 Scalability or Extensibility Requirements

PR-SE1. The system shall be extensible with the capability to add more detection agents and experts to the decision forum without any major modifications required to the decision forum.

Rationale: Being open for extension and closed for modification is one of the fundamental software design principles that needs to be adhered to for modular and clean code.

PR-SE2. The system should be designed for multi-platform accessibility, enabling future deployment on both web and iOS platforms.

Rationale: While initially developed for Android, expanding to web and iOS platforms will enhance accessibility and reach a broader user base.

5.3.8 Longevity Requirements

PR-L1. The system should be built to accommodate future improvements in **AI** models.

Rationale: As **AI** research progresses, more efficient architectures may emerge as industry standards. The system must be flexible enough to incorporate these advancements without needing significant changes to its architecture.

- PR-L2. The source code and documentation should be organized with effective version control and clear guidelines for developers throughout the development phase.
Rationale: Well-maintained documentation and version control allow future developers to work with the system smoothly, reducing the risk of code issues and minimizing technical debt. [16]

5.4 Operational and Environmental Requirements

5.4.1 Expected Physical Environment

- OE-EPE1. The system should be optimized to perform well on mobile devices with limited hardware capabilities.
Rationale: Since many users may not have high-end smartphones, the application needs to be designed for devices with lower processing power, less RAM, and slower internet speeds. Implementing techniques such as model quantization can help ensure a seamless experience on these devices.

5.4.2 Requirements for Interfacing with Adjacent Systems

- OE-IA1. The system must be able to send and receive data from image recognition APIs and external databases.
Rationale: Since the app relies on machine learning-based image recognition and species databases for mushroom identification, it must maintain seamless communication with these services for accurate results.[17]
- OE-IA2. The system must be capable of integrating with popular social media platforms to enable seamless sharing of content.
Rationale: Users should have the ability to easily share their mushroom identifications and findings directly from the app to social media platforms such as Facebook, Twitter, or Instagram. This integration will allow users to effortlessly post their results without the need to manually upload images or data, enhancing user experience and promoting engagement with the app.

5.4.3 Productization Requirements

N/A

5.4.4 Release Requirements

- OE-R1. The app must be compatible with Android 9.0 or above. [18]
Rationale: Making the system compatible with older, but still commonly used, Android versions ensures greater accessibility. Android 9.0 supports modern **AI** and image processing features without compromising performance.
- OE-R2. The application must adhere to Google Play Store policies, including those related to data privacy and API usage.
Rationale: To ensure the app is accepted and stays available on the Play Store, it must follow Google's developer guidelines for privacy, data handling, and API usage limits. Failure to comply with these guidelines may result in the app being removed from the store. [19]

5.5 Maintainability and Support Requirements

5.5.1 Maintenance Requirements

- MS-M1. The system must provide quarterly software updates to patch bugs and improve the application.
Rationale: Quarterly updates will allow continuous improvement while simultaneously fixing any minor bugs or potential risk factors. Quarterly periods will ensure that the application is maintained while avoiding excessive notifications or interruptions that may frustrate users. [20]

5.5.2 Supportability Requirements

- MS-S1. The system must include an easily accessible in-app FAQ and troubleshooting guide.
Rationale: Users must have immediate access to support resources for common issues such as unsuccessful image upload, reducing dependency on external customer support and creating a more positive user experience.
- MS-S2. The system must provide a dedicated feedback form for users to report issues or suggest improvements directly through the app.
Rationale: A built-in feedback system allows users to share their experiences and helps developers prioritize updates and fixes.
- MS-S3. The system must include a support ticketing feature for users to report unresolved issues.
Rationale: Certain issues may need direct attention from our team. A support ticketing system enables users to report problems, ensuring that user-reported issues are prioritized for resolution.

5.5.3 Adaptability Requirements

- MS-A1. The system must be compatible with the latest two major versions of Android operating system.
Rationale: Ensuring compatibility with current operating system maximizes accessibility and usability of the application for a wide range of users with varying devices.
- MS-A2. The system must allow application updates to individual components without requiring a full app reinstall.
Rationale: Modular updates will simplify the process of adding new features or fixing bugs while reducing potential disruptions to the user experience.

5.6 Security Requirements

5.6.1 Access Requirements

- SR-AC1. Users should be granted access to an account only if they enter the correct login credentials.
Rationale: This ensures that only authorized users can access their accounts and manage their personal mushroom collections and identification history. It also prevents the creation of "master accounts" or backdoors that could be used to gain unauthorized access, safeguarding user data from unauthorized viewers.
- SR-AC2. The app must request user consent to access the device's camera, storage, and **GPS** (location) functionalities.
Rationale: To capture high-quality macro and micro images for mushroom identification, store user data (such as saved identifications), and utilize location data to improve identification accuracy, the app needs permission to access these device features. It's important to obtain the user's consent before accessing the camera, so they are aware of which phone features the system is using.

5.6.2 Integrity Requirements

- SR-INT1. All user data—including images, textual descriptions, and account information—must be encrypted during transmission.
Rationale: Encryption safeguards the sensitive information of users from interception and tampering, ensuring the integrity of data exchanged between the app and external identification services.
- SR-INT2. An account’s history or mushroom collection can only be modified if the user is logged into the account.
Rationale: Individuals who are not logged into a user’s account should not have the ability to alter any data related to that account.

5.6.3 Privacy Requirements

- SR-P1. The app must clearly inform users about the collection and use of their personal data (including images, location, and text inputs) and obtain their explicit consent.
Rationale: This transparency is required by app store policies and data protection regulations, ensuring users are aware of and agree to how their data will be used.
- SR-P2. The app must provide users with a comprehensive and legally adequate privacy notice.
Rationale: A clear privacy notice builds trust with users and ensures compliance with legal obligations, such as those outlined in the Google Play Developer Distribution Agreement. [21]

5.6.4 Audit Requirements

- SR-AU1. The app must log critical security events such as login attempts, image uploads, and mushroom identification requests.
Rationale: Maintaining logs of these events is essential for monitoring user activity, diagnosing issues, and investigating any potential security incidents.

5.6.5 Immunity Requirements

- SR-IM1. The application should be protected against harmful or malicious input from users.
Rationale: Proper input validation helps to prevent attacks such as SQL injection or other forms of code injection, ensuring that only valid and safe data is processed by the app.

5.7 Cultural and Political Requirements

5.7.1 Cultural Requirements

- CP-C1. The system shall provide culturally sensitive descriptions, avoiding offensive terminology when discussing mushroom edibility or toxicity.
Rationale: It is important to respect diverse cultures and beliefs, especially when dealing with topics like food safety. Using neutral, accurate language helps ensure that descriptions are inclusive and prevent offending users from different cultural backgrounds. [22]
- CP-C2. The system shall consider regional mushroom naming conventions to ensure inclusivity and avoid misidentification.
Rationale: Mushroom names can vary by region, and using local naming conventions will make the app more accessible and accurate for users worldwide. This reduces the risk of confusion or misidentification, helping users feel more confident in the information provided.

- CP-C3. The system should allow users to customize their experience based on local mushroom species relevant to their region.
Rationale: Different regions have distinct mushroom species, so enabling users to tailor the app to their local environment ensures that the content is more relevant and useful. This personalizes the experience, making it easier for users to identify mushrooms in their area.

5.7.2 Political Requirements

- CP-P1. The system shall ensure the app does not promote illegal foraging or harvesting in protected areas, aligning with national park and conservation laws.
Rationale: The app must adhere to legal and ethical guidelines to protect biodiversity and ecosystems. Promoting illegal foraging in protected areas could harm the environment and violate national park and conservation laws. By following these regulations, the app helps prevent the degradation of natural habitats.
- CP-P2. The system shall ensure compliance with international wildlife protection agreements to prevent unethical foraging practices.
Rationale: International wildlife protection agreements set global standards for ethical foraging and conservation. Ensuring compliance with these agreements prevents harmful foraging practices, supports sustainable ecosystems, and promotes responsible behavior among users. [23]

5.8 Legal Requirements

5.8.1 Compliance Requirements

- LR-COMP1. The system must comply with data privacy laws (e.g., GDPR, CCPA) regarding user images and location tracking.
Rationale: The system must adhere to data privacy regulations to protect user data, ensuring that images and location information are handled responsibly and transparently. This compliance builds user trust and avoids legal repercussions for mishandling personal data. [24]
- LR-COMP2. The system must ensure compliance with accessibility standards (e.g., WCAG 2.1) to support users with disabilities.
Rationale: To be inclusive, the system must follow accessibility standards to provide a positive user experience for people with disabilities. This ensures that the app is usable by a broader audience and meets legal accessibility requirements.
- LR-COMP3. The system must comply with PIPEDA (Personal Information Protection and Electronic Documents Act) regarding the collection, use, and storage of personal data.
Rationale: The system must align with PIPEDA to ensure that it handles personal data in a manner that respects Canadian privacy rights. This compliance is essential for protecting user information and preventing legal issues related to the unauthorized collection or misuse of personal data. [25]

5.8.2 Standards Requirements

- LR-STD1. The system must follow ISO 13485 (if any aspects of the app involve health or medical guidance related to poisonous mushrooms).

Rationale: If the app provides health or medical-related guidance regarding poisonous mushrooms, it must comply with ISO 13485, which sets requirements for quality management systems in the medical device industry. This ensures the app meets high standards for safety, accuracy, and reliability when handling health-related information. [26]

LR-STD2. The system must ensure app security standards (e.g., OWASP Mobile Security for secure data storage and sharing).

Rationale: To protect user data and prevent security breaches, the system must adhere to recognized app security standards like OWASP Mobile Security. This ensures secure data storage and sharing, safeguarding against threats such as data leaks, hacking, or unauthorized access, and maintaining user trust in the app. [27]

6 Innovative Feature

The chosen innovative feature to implement is the ability for users to collect and track identified mushrooms in their personal account. When a user successfully identifies a mushroom, it is saved to their collection, creating a log of their discoveries. This feature enhances user engagement and provides a rewarding experience for mushroom enthusiasts. Additionally, if a user identifies an edible mushroom, they can explore recipes tailored to that specific type, making the app both educational and practical.

We have also come up with additional creative features, as listed below:

- **Mushroom Collection System**

- Users can build a personal database of identified mushrooms.
- Each identified mushroom is automatically saved in their account.
- Provides details such as location, date, and identification method (macro photo, micro photo, or text description).

- **Recipe Recommendations**

- When a user identifies an edible mushroom, they receive recipe suggestions.
- Recipes are categorized based on the type of mushroom and its culinary uses.

- **Social Media Sharing**

- Users can share their mushroom discoveries on social media platforms such as Instagram, Twitter, and Facebook.
- Allows for easy sharing of identification results, achievements, and recipes with friends and followers.
- Includes options to add captions, hashtags, and location tags to posts.

- **Offline Identification Mode**

- Users can save photos and descriptions offline for later identification when they regain internet access.

This combination of features aims to create a fun, educational, and interactive experience for mushroom foragers and nature lovers while also allowing them to share their journey with a wider audience.

A Division of Labour

A.1 Contributions

- Section 1.1 - Purpose - Aiden Lao
- Section 1.2 - Scope - Omar Alam
- Section 1.3 - Definitions, Acronyms, and Abbreviations - All
- Section 1.4 - References - All
- Section 1.5 - Overview - Luka Mahrt-Smith
- Section 2.1 - Product Perspective - Luka Mahrt-Smith
- Section 2.2 - Product Functions - Omar Alam
- Section 2.3 - User Characteristics - Farid Bastoros
- Section 2.4 - Constraints - Aiden Lao
- Section 2.5 - Assumptions and Dependencies - Farid Bastoros
- Section 2.6 - Apportioning of Requirements - Neha Bhatla
- Section 3 - Use case diagram - Aidan Lao
- Section 4 - Highlight of Functional Requirements.BE1 - Omar Alam
- Section 4 - Highlight of Functional Requirements.BE2 - Luka Mahrt-Smith
- Section 4 - Highlight of Functional Requirements.BE3 - Neha Bhatla
- Section 4 - Highlight of Functional Requirements.BE4 - Farid Bastoros
- Section 4 - Highlight of Functional Requirements.BE5 - Neha Bhatla
- Section 5.1 - Look and Feel Requirements - Farid Bastoros
- Section 5.2 - Usability and Humanity Requirements - Omar Alam
- Section 5.3 - Performance Requirements - Omar Alam
- Section 5.4 - Operational and Environmental Requirements - Farid Bastoros
- Section 5.5 - Maintainability and Support Requirements - Neha Bhatla
- Section 5.6 - Security Requirements - Luka Mahrt-Smith
- Section 5.7 - Cultural and Political Requirements - Aidan Lao
- Section 5.8 - Legal Requirements - Aidan Lao
- Final Editing - Omar Alam



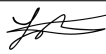

A.2 Edits Based on Feedback

All items below have been completed solely by **Farid Bastoros**, including:

- Section 1.3 - Definitions, Acronyms, and Abbreviations - **Farid Bastoros**
- Section 1.4 - References - **Farid Bastoros**
- Section 4 - Highlight of Functional Requirements BE1 - **Farid Bastoros**
- Section 5.1 - Look and Feel Requirements - **Farid Bastoros**
- Section 5.2 - Usability and Humanity Requirements - **Farid Bastoros**
- Section 5.3 - Performance Requirements - **Farid Bastoros**
- Section 5.4 - Operational and Environmental Requirements - **Farid Bastoros**
- Section 5.5 - Maintainability and Support Requirements - **Farid Bastoros**
- Section 5.6 - Security Requirements - **Farid Bastoros**
- Section 5.7 - Cultural and Political Requirements - **Farid Bastoros**
- Section 5.8 - Legal Requirements - **Farid Bastoros**
- Section 6 - Innovative Feature - **Farid Bastoros**

Section 4 - Highlight of Functional Requirements BE6 - Omar Alam

A.3 Signatures

Name	Mac ID	Signature
Aiden Lao	laoa6	
Omar Alam	alamo2	
Luka Mahrt-Smith	mahrtsml	
Farid Bastoros	bastorof	
Neha Bhatla	bhatlan	