

Software Requirements Specification Document

Group #4

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1 Introduction

1.1 Purpose

The purpose of this SRS document is to provide the stakeholders with a better understanding of the system structure and general functionality. The document will be used to formalize the regulation of system operations and assist in maintaining the system. The intended audience of the SRS is mainly the project managers.

1.2 Scope

FORESTER is an Android application that will allow Users to identify plants in Ontario. The User will be able to identify a plant based on selective characteristics such as colour, size, leaf shape, flowers, fruit, thorns, and location. The system will produce a summary page of the plant once identified, that would include a picture and whether it is poisonous and/or edible. Further utilities of Forester include a Researcher option that would allow approved parties to view and potentially alter the internal data set, as well as an Administrator that oversees any changes. The application will also include the option for Users to filter for plants by location.

1.3 Definitions, Acronyms, and Abbreviations

- a) **User:** The consumer-level client of the system.
- b) **Researcher:** An approved party that can view and request updates to the database
- c) **Administrator:** A management-level party that approves and denies requests for changes to the database
- d) **Homepage:** The interface for User-level functions
- e) **Researcher Homepage:** The interface for Researcher-level functions
- f) **Administrator Homepage:** The interface for Administrator-level functions
- g) **Contribution Record:** A record of all the changes a specific Researcher has requested
- h) **Database Update Requests:** Requests for changes to the database that the Administrator has not yet approved or denied

1.4 References

- a) The available plant identification system “PlantNet Plant Identification” referenced in section 2.1 can be found at <https://identify.plantnet-project.org/>

1.5 Overview

The rest of SRS contains product perspectives, product functions, user characteristics, constraints, assumptions & dependencies, apportioning of requirements and system’s functional & non-functional requirements, followed by project’s division of labour.

This SRS consists of overall description of scopes, purposes, constraints and features of the system which identify plants in Ontario, and then it lists out all functional and non-functional requirements which programmers are supposed to follow when developing the project. All functional requirements are in forms of business events which have view points as external actors to keep track of expected functionalities of the system. Non-functional requirements are all regulations to improve qualities of the system.

2 Overall Description

2.1 Product Perspective

There are currently many plant identification applications available such as PlantNet Plant Identification, however they all share the same method: photo analysis. While it can be convenient, analyzing photos taken by users can have some drawbacks: it requires the user to be connected to the internet and it requires the user to be able to take a good photograph. Our application will be based off of the user's observations which they will record with text, and we aim to store all of the required data locally.

Our application will be entirely independent and self-contained.

2.2 Product Functions

The plant identification application will allow the Users to identify a specific plant and receive **possible matches with relevant information on each match**. They will obtain a result by entering the characteristics of the plant in question. The search criteria will include various features that will assist in classifying the plant based on its description.

Through the data used, the result of the search will display **all possible matches to the plant, ranked by the best match the entered description**. The User will be able to select the desired plant and the system will provide more information on the plants, such as whether it is poisonous or not.

A unique feature of Forester is that the User will be able to receive a list of plants known to be in an entered location. This functionality of the application can be used in scenarios where a user wants to identify the most typical plants in an area such as a national park or forest.

An additional feature of the application is that there will be a Researcher mode, where academics and professionals can get access to the data in the system. Researcher mode will allow the user to alter and add to the data set. These functionalities will be restricted to only the Researchers and cannot be accessed by the Users.

The final feature of the application is an Administrator mode. This will allow management level users to approve or deny Database Update Requests from the Researchers. The Administrator functionalities will be restricted from the Researchers and Users.

2.3 User Characteristics

For the generic Users of the application, the expected demographic is foragers and regular people who have an interest in plants, wanting to find out whether a plant is poisonous, edible, or neither. For the Researchers of the application, the expected demographic is academics who have knowledge in the field of plants and plant identification. For the Administrators of the application, the expected demographic is management level employees of Forester.

2.4 Constraints

The project design and execution will be limited to what can be achieved within the set time frame placed by the duration of the course. Additionally, the database will be constrained by what the developers can find or produce within the time frame. The project will also be constrained by having no budget. The developers will have to develop the app without any monetary support.

2.5 Assumptions and Dependencies

1. The User will be attempting to identify plants in Ontario.
2. The system will require the User to have a functional GPS in order to track their location.

2.6 Apportioning of Requirements

Not applicable.

3 Functional Requirements

VP1. User

BE1.1 The User wants to access the Homepage

- i. Upon running the application, the system must direct the User to the Homepage

BE1.2 The User wants to identify a particular plant.

- i. The system must present the User with the option to identify a plant
- ii. The system must prompt the User to enter characteristics to identify the plant
- iii. The system must prompt the User to confirm entered characteristics
- iv. The system must display all possible matches to the plant the User has described
- v. Each match displayed must state the name of the plant, whether or not it is poisonous, whether or not it is edible, and a picture of the plant
- vi. The system must save the results of the search
- vii. The User must be given the option to return to the Homepage

BE1.3 The User wants to view the plants common to their area

- i. The system must present the User with the option to do location-based plant searches
- ii. The system must obtain the User's location using either location services or prompting the User to enter a location
- iii. The system must display all of the known plants in the area the User enters
- iv. Each match displayed must state the name of the plant, whether or not it is poisonous, whether or not it is edible, and a picture of the plant
- v. The system must save the results of the search
- vi. The system must present the option of returning to the Homepage

BE1.4 The User wants to view past plant identification searches

- i. The system must present the User with the option to view past searches
- ii. The system must display the User's previous searches, identified by a date and time stamp of when the results were initially displayed to the User
- iii. The searches must be ordered by when they occurred, with the most recent search at the top
- iv. The User must be given the option to return to the Homepage

BE1.5 The User wants to view the results of a specific past search

- i. The User must be permitted to select a specific search from the history to view the results
- ii. The system must display the results of the search as well as any pictures the User attached to the search.
- iii. The User must be given the option to return to the Homepage

BE1.6 The User wants to clear their Search History

- i. The system must present the User with the option to clear their Search History
- ii. The system must present the User with a message that asks the User if they are sure they wish to clear their Search History and warns them that the information cannot be retrieved if they proceed
- iii. The warning message must have "Proceed" and "Cancel" options
- iv. The warning message must close when the Users selects an option
- v. If the User chooses to cancel, they must be returned to the Homepage

- vi. If the User chooses to proceed, the system must delete all search records and display a confirmation of deletion message
- vii. The User must be presented with an option to return to the Homepage

VP2. Researcher

BE2.1 The Researcher wants to log in to the system

- i. The system must present the Researcher with the option of accessing the system as a Researcher
- ii. The system must prompt the Researcher to enter their log in credentials
- iii. The system must verify the login credentials
- iv. If invalid credentials are entered, the Researcher must be presented with a message informing them their login was unsuccessful due to invalid credentials
- v. The system must display the Researcher Homepage when the Researcher has successfully entered their credentials

BE2.2 The Researcher wants to view the plants in the database

- i. The system must present the Researcher with the option to view the plant database
- ii. When the Researcher selects the option to view the database, the database must be displayed
- iii. Plants in the database must be identified by name
- iv. The Researcher must be presented with the option to return to the Researcher Homepage

BE2.3 The Researcher wants to view the information on a specific plant

- i. The Researcher must be given the option to search for and select a specific plant to view its information
- ii. The plant information page must show the name of the plant, associated colours, approximate sizes, leaf shapes, presence of flowers, presence of fruit, presence of thorns, locations, and picture
- iii. The Researcher must be given the option to return to the Researcher Homepage

BE2.4 The Researcher wants to propose an edit to the information attached to a particular plant

- i. The system must present the Researcher with the option to request edits on plant information
- ii. The system must allow the Researcher to enter the information they wish to change
- iii. The Researcher must be presented with the option to either submit or discard the request for change
- iv. The system must require the Researcher to provide a reason for the edit request
- v. The details of the request must be added to the Researcher's Contribution Record, with the status set to "Awaiting Approval"
- vi. The Researcher must be redirected to the Researcher Homepage once they have submitted or discarded their changes

BE2.5 The Researcher wants to propose the addition of a new plant into the system

- i. The system must present the Researcher with the option to request the addition of a new plant into the database
- ii. The system must present the Researcher with a submission page that prompts them to enter the new plant's information
- iii. The system must allow the User to either submit or discard the request for the new plant
- iv. The Researcher must be required to enter information for every field for the request to be submitted
- v. The details of the request must be added to the Researcher's Contribution Record, with the status set to "Awaiting Approval"

- vi. The Researcher must be redirected to the Researcher Homepage

BE2.6 The Researcher wants to propose the deletion of a plant from the system

- i. The system must present the Researcher with the option to request the deletion of a plant from the database
- ii. The system must present the Researcher with the option to submit the request for approval
- iii. The Researcher must be prompted to provide a reason for deletion in order to submit the request
- iv. The details of the request must be added to the Researcher's Contribution Record, with the status set to "Awaiting Approval"
- v. The Researcher must be redirected to the Researcher Homepage

BE2.7 The Researcher wants to view their contributions

- i. The Researcher must be given the option to view their Contribution Record
- ii. The system must display the edit, addition, and deletion requests the Researcher has made
- iii. Each request must display the date and time of submission as well as their status as either "Awaiting Approval", "Approved", or "Denied"
- iv. The contributions must be ordered by date and time of submission, with the most recent first
- v. The system must present the Researcher with the option to return to the Researcher Homepage

BE2.8 The Researcher wants to view the details of a specific request

- i. The system must allow the Researcher to click on a specific request to view the details
- ii. For an edit, the record must show the date and time of request submission, the status of the request, original information for the plant, and the suggested edit
- iii. For an addition, the record must show the date and time of request submission, the status of the request, and the information of the new plant
- iv. For a deletion, the record must show the date and time of request submission, the status of the request, and the original plant information
- v. The system must present the Researcher with the option of returning to the Researcher Homepage

BE2.9 The Researcher wants to update their password

- i. The system must provide the Researcher with the option to update their password
- ii. The system must prompt the Researcher to confirm their current password in order to choose a new password
- iii. The system must prompt the Researcher to enter and reenter their new password
- iv. The system must present the Researcher with the option to submit the password change or discard it
- v. The system must redirect the Researcher to the Researcher Homepage when they have submitted or discarded their password change

VP3. Administrator

BE3.1 The Administrator wants to log in to the system

- i. The system must present the option of logging in as an Administrator
- ii. The system must prompt the Administrator to enter their log in credentials
- iii. The system must verify the login credentials
- iv. If invalid credentials are entered, the Administrator must be presented with a message informing them their login was unsuccessful due to invalid credentials
- v. The system must display the Administrator Homepage when the Administrator has successfully entered their credentials

- BE3.2 The Administrator wants to view the Database Update Requests
- i. The system must present the option to view Database Update Requests
 - ii. The Database Update Requests page must display all pending requests that have not yet been approved or denied
 - iii. Each request must display the type of request, the date and time of submission, the name of the plant it intends to modify, and identification of the Researcher who submitted the request
 - iv. The requests must be sorted by date and time of submission, with the oldest at the top
 - v. The system must present the Administrator with the option to return to the Administrator Homepage
- BE3.3 The Administrator wants to view a specific request
- i. The system must allow the Administrator to select a specific request
 - ii. For all requests, the system must display the type of request, the date and time of request submission, and identification of the Researcher who submitted the
 - iii. For edits, the system must show the original information, the requested new information, and the justification for the edit
 - iv. For additions, the system must show the information of the proposed plant
 - v. For deletions, the system must show the information of the plant and the justification for deletion
 - vi. The system must present the Administrator with the option to return to the Administrator Homepage
- BE3.4 The Administrator wants to approve a specific request
- i. The system must present the Administrator with the option of approving a request
 - ii. The database must be updated to reflect the approved request
- BE3.5 The Administrator wants to deny a specific request
- i. The system must present the Administrator with the option of denying a request
- BE3.6 The Administrator wants to update their password
- i. The system must provide the Administrator with the option to update their password
 - ii. The system must prompt the Administrator to confirm their current password in order to choose a new password
 - iii. The system must prompt the Administrator to enter and reenter their new password
 - iv. The system must present the Administrator with the option to submit the password change or discard it
 - v. The system must redirect the Administrator to the Administrator Homepage when they have submitted or discarded their password change

4 Non-Functional Requirements

4.1 Look and Feel Requirements

4.1.1 Appearance Requirements

- LF1. The application **shall** provide a uniform look and feel between all sections
- LF2. The default text size shall be big enough for the average user to read
- LF3. The application **shall** clearly show all buttons, pages, search bar.

4.1.2 Style Requirements

- LF4. The application shall have a modern design that is appealing to look at

4.2 Usability and Humanity Requirements

4.2.1 Ease of Use Requirements

UH1. The application shall communicate the plants information clearly in an an organized manner

UH2. The application shall be easy and intuitive to use.

4.2.2 Personalization and Internationalization Requirements

UH4. N/A

4.2.3 Learning Requirements

UH5. The application shall be designed such that the user requires no tutorial to use it.

4.2.4 Understandability and Politeness Requirements

UH6. The information provided by application shall be clear to understand for users fluent in English

4.2.5 Accessibility Requirements

UH7. The application shall have an impaired vision mode that increases the default font size by 25%

4.3 Performance Requirements

4.3.1 Speed and Latency Requirements

PR1. The product shall provide the user with an output within 10 seconds.

4.3.2 Safety-Critical Requirements

PR2. N/A

4.3.3 Precision or Accuracy Requirements

PR3. The product shall correctly determine the plant in question with its first guess 90% of the time.

PR4. The product shall correctly determine the plant in question within its third guess 99% of the time.

4.3.4 Reliability and Availability Requirements

PR5. N/A

4.3.5 Robustness or Fault-Tolerance Requirements

PR6. N/A

4.3.6 Capacity Requirements

PR7. The product shall take up no more than 1GB of storage when installed on the target device.

4.3.7 Scalability or Extensibility Requirements

PR8. N/A

4.3.8 Longevity Requirements

PR9. N/A

4.4 Operational and Environmental Requirements

4.4.1 Expected Physical Environment

OE1. The product shall be able to be used in remote locations such as parks and forests without access to data from a cellular network.

4.4.2 Requirements for Interfacing with Adjacent Systems

OE2. N/A

4.4.3 Productization Requirements

OE3. N/A

4.4.4 Release Requirements

OE4. N/A

4.5 Maintainability and Support Requirements

4.5.1 Maintenance Requirements

MS1. The system is **shall** run its services independently when some functionalities of it are in maintenance or not available.

MS2. The system **shall** save all previous Researcher's requests when it's in maintenance.

4.5.2 Supportability Requirements

MS3. **N/A**

4.5.3 Adaptability Requirements

MS4. The system **shall be able to** support different terminal devices which have Android OS.

MS5. The application **shall be** able to fit incoming updates of Android OS.

4.6 Security Requirements

4.6.1 Access Requirements

SR1. **Only Researchers may view and request changes to the data set**

SR2. **Only Administrators may approve or deny Database Update Requests**

4.6.2 Integrity Requirements

SR3. **The system shall be protected from all unauthorized attempts to read or manipulate its data.**

SR4. Standard users shall not have authority to edit data.

4.6.3 Privacy Requirements

SR5. The system shall verify all manipulations of data to get rid of sensitive or illegal texts.

SR6. The system shall not provide any type of users with personal information of any other users.

4.6.4 Audit Requirements

SR7. Users are required to confirm whether the change of data is expected.

SR8. The system shall allow users to retype if previous inputs are invalid.

4.6.5 Immunity Requirements

SR9. N/A

4.7 Cultural and Political Requirements

4.7.1 Cultural Requirements

CP1. The **system** shall identify plants specific to Ontario

CP2. The **system** shall use Canadian English spelling

CP3. No material considered offensive in Canada shall be used

4.7.2 Political Requirements

CP4. N/A

4.8 Legal Requirements

4.8.1 Compliance Requirements

LR1. No images used in the system shall infringe on any copyrights

LR2. The system shall operate within the jurisdiction of Canada

LR3. The system shall comply with the policies of Google's play store

4.8.2 Standards Requirements

LR4. N/A

A Division of Labour

Purpose HAO

Scope – Everyone

Definitions – Everyone

References – Everyone

Overview – HAO

Product perspective EVAN

Product functions ABRAR

User Characteristics HAO

Constraints Everyone

Assumptions & Dep. Everyone

Apportioning of req. - Everyone

Functional requirements - SUSAN

Non-functional requirements:

4.1. & 4.2. ALLEN

4.3. & 4.4. EVAN

4.5. & 4.6. HAO

4.7. & 4.8. SUSAN

Division of Labour - ABRAR

D1 Resubmission Edits - SUSAN