Software Requirement Specification

Purpose To simplify the process of plant identification.

System Overview

This will be a mobile application that relies on data from regional herbaria. The application will be written in C# with cross-platform support using Xamarin, and it will pull data from an aggregate, multi- institutional data set. The data will be accessible through the Symbiota API or from a database which we will maintain (and which will be loaded from data from a Symbiota-based flat file).

Overall Description

System Interfaces

The C# code will need to make calls (through a data layer) to some type of data source. The two most likely options will be Symbiota or a locally-hosted database.

User Interfaces

The user will interact with the application via a touch screen-capable mobile device that operates on either the Android or iOS operating system.

Hardware Interfaces Android and iOS devices will be the hardware on which the application will run, and this hardware will handle the processing of the user interface. C# will allow us to use Xamarin to target the hardware directly. Our application will be hosted on cloud servers managed by Google and Apple, and our databases will either be stored at multiple colleges or at IU. We may potentially use a cloud database for some storage.

Software Interfaces The user needs to be able to interact with the application to pull data from the database(s), and the database(s) need(s) to be able to send information back to the application.

Memory Constraints This will depend upon implementation is remains to be determined.

Adaptation Requirements This needs to be available on both Android and iOS.

Product Functions The following functions will be required:

• Must be usable by amateurs.

• Must be usable by professionals.

• Must be location-aware (able to determine GPS location).

• Must allow user to identify local plants using a plant identification key.

• Must be able to easily access data from local herbaria.

• Must allow user to view basic information about local plants.

User Characteristics The user will be at least 10 years of age and will have an amateur to professional level of skill at identifying plants. The users could be anyone from children to botanists to biologists, to students to citizen scientists to casual learners to herbarium employees and volunteers to teachers.

Constraints The system needs to be relatively fast, small, and attractive.

Assumptions

Data will be hostable by us or will be hosted and consistently available.

Dependencies Some dependencies include:

• The Apple Store for applications

• The Google Play store for applications

• The Consortium of Midwest Herbaria’s data

• iDigBio

• The continued cooperation and maintenance of herbaria data through organizations like the Consortium of Midwest Herbaria

Specific Requirements

External Interface Requirements

The user will initially see a title page, which will load and display basic information about the application.

On the following screen, the user should be offered an initial choice between two options:

* A GPS-based search
* A key-based search
* A tree-based ability to navigate directly to a known species

The GPS-based search will display plants within a designated radius and will give the user an opportunity to select a specific plant or to refine his or her search by using the key which will be available upon selection of a key-based search. The key option will allow users to select from several options, filtering plants as it goes. The key-based search will not be limited within the designated radius. All pages will allow an option for going back one screen or starting over entirely. The specific plant profile will have a photo of the plant, its name, and a brief description of the plant. The final option, for tree-based navigation, will allow a person who is more familiar with plants (like a botanist) to navigate directly to a plant family or species without having to use the GPS- or key-based search.

Functional Requirements The application will need to be able to do the following things:

• Get the user’s GPS location

• Receive user input via a touch screen

• Store selected plant qualities in a list

• Apply the plan quality list as a filter to a large dataset of plant information

• Track the count of plants remaining in the filtered list

• Display a profile picture of a plant with its name, description

• Display text to the screen

• Display a gallery of plants and images along the bottom half of the screen

• Contact a database (directly or through an API) to retrieve data

• Go back one screen

• Return to the start screen

• Get the current date

Performance Requirements

The application needs to be as fast as a comparable application. The specifics remain to be determined.

Design Constraints The design of the application must be mobile-friendly and must be displayable on Android and iOS devices. This will provide limitations on screen real estate and functionality.

Standards Compliance The only constrains will be in copyright laws when using photographs. These images should have a Creative Commons license and should be free for educational use.

Logical Database Requirement Any database which will allow quick access will work here. It must be possible to filter from the full database based on a list of attributes. The tables are not yet available but will need to handle data that is roughly like this:

• ID

• Genus

• Species

• Description

• Quality 1

• Quality 2

• Quality n