NEEDS ASSESSMENT FOR BIOMAP MOBILE APPLICATION

GRAEME FAUL[1] & GREGORY LINKLATER[1]

May 9, 2016

CONTENTS

[1] *Department of Computer Science, Rhodes University, Grahamstown, South Africa*

1 PROBLEM SPECIFICATION

1.1 Background

The Animal Demography Unit (ADU) is an online database of fauna and flora sightings from around the world. It is comprised of records sent in by various individuals from around the world. Each record notes the date, location, classification of the species of the subject of any particular entry. It also includes one or more pictures of the subject and the name of the individual who submitted the record. Each record undergoes a verification process to determine its validity before it is added to the database.

1.2 The Problem

The problem outlined by the client is that the system for recording new entries is slow and outdated. The current process for creating a new record is done manually on a web based system with the individual having to capture everything themselves. This includes location, pictures (which often have to be transferred from camera to a PC and then uploaded), personal details, date and species. This is a very time consuming process and also presents the possibility of incorrect data capture. From this, a clear need for an automated and modern solution can be identified.

2 EXISTING SYSTEM

Assuming the individual has a registered account on ADU, the steps for adding a new record are as follows:

1. Log in to the website
2. Click “Data upload” link
3. Fill in all fields, namely: Additional observers, date (will default to current date), and location (exact latitude and longitude can be determined using Google Map widget)
4. Save the record and continue to next page

On the second page, the user can enter up to three records at once on any of the various projects. For each record the user must:

1. Select the project for which they wish the record to be entered in
2. Enter the collection date (will default to current date)
3. Upload up to three pictures (Most likely copied from a camera enabled device)
4. Upload a sound file (for use on FrogMAP only)
5. Identify the species
6. Enter any additional notes
7. Enter nest count and type (for use on PHOWN only)

3 NEEDS OF THE CLIENT

The client would like an android smart phone application to be developed that will reduce the human error in the process of capturing information of specimens as mentioned in Section 1.2 on the preceding page. In it's simplest form, users of the application should be able to submit photos and metadata of specimens found in the wild while automating as much of the data capture process as possible. This serves to decrease the barrier to entry for participation in this citizen science project and therefore would hopefully increase participation.

The client has requested that the application be created with non-technical users in mind; meaning that the application should be extremely simple to operate, with very little interaction needed to get to the main purpose of the application – namely taking pictures of newly found specimens. Following that, the user should be allowed to optionally add descriptions and additional media to the submission and should confirm the automatically entered data such as the date and locality of the specimen. Once the submission is made then the users' part of the process is done and they can move to new specimens to collect.

3.1 Client Requests

The specific requests of the client are as follows:

1. Verify the identity of the user.
2. The user must be able to submit new records for any one of the databases provided by the ADU.
3. Submissions should contain the following information:
   - Media relating to the specimen found (photographs, sound files, etc.)
   - Location data automatically obtained from the user's device
   - Date and time automatically obtained from the user's device
   - Optional universal or database specific metadata and textual descriptions of location and specimen
   - Metadata pertaining to the user who made the submission
4. Allow the user to overwrite any automatically obtained data (namely date, time and location).
5. Detect poor photographs and notify user as such.
6. Option to only upload records when the user is connected to Wi-Fi.
7. Verify that all new records are complete before submission.

4 ASSESSMENT OF NEEDS

1. Due to the nature of credentials, it is unlikely that the ADU will allow us access to their users' credentials. While the system is under developement, authentication will happen through the use of a separate

authentication service in order to demonstrate functionality; this is the problem being deferred for when integration takes place.

2. The user will select the database that they wish to contribute to before making a submission.

3. Using the built-in hardware and sensors of a smart phone it is possible to automate the process of capturing GPS, date and time whenever a picture is taken. It is further possible to automate data entry by having the user log in and select the database they wish to contribute to prior to taking a photo; this would allow us to attach user data to the submission.

4. An option will be made available next to each of the automatically obtained entries to confirm or edit the value therein.

5. This is unlikely to be viable as this functionality (which would be labelled a "nice to have") represents a disproportionate amount of work for the benefit gained from doing so. This functionality is also likely to be costly in terms of device resources such as battery life and would also require more modern devices to run the app. An alternative method of dealing with this may be to include a tutorial in the app or at the very least; a link to such a tutorial.

6. Submissions will be appended to a queue which will be processed either immediately or when the user is next connected to a Wi-Fi network. This can be configured from the application's settings page.

7. Required fields will be the same as that of the existing ADU system. Submissions missing required fields will not be allowed by the app and helpful messages will be displayed detailing what is missing from a submission.