Software Requirements Specification

for

LizCapApp

Version 1.0

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Revision History

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| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| Pankaj Singh | 03/17/2017 | Generalization of the app for other Biologists. Edited Requirement 3.1 | 1.2 |
|  |  |  |  |

# Introduction

## Purpose

This document specifies the software requirements of mobile application to felicitate data recordings of field survey. The document captures the requirements gathered by reverse engineering currently, existing LizCapApp and further enhancements and improvements discussed during meetings. This product is standalone mobile application which requires interaction with server only at bulk synchronization (upload and download from server).

The scope of the document is only the requirements related to mobile application to be developed. It neither covers data related requirements at the server side nor web application requirements to access the server data.

## Document Conventions

Data Server refers to database server already existing and associated with this application. Every requirement has their own priority.

## Intended Audience and Reading Suggestions

The document is intended for designer of LizCapApp, developer/programmer of LizCapApp and client of the mobile application.

## Product Scope

Software is a mobile application targeted to field survey of flora and fauna with special focus on mark recapture strategies. This mobile application helps biologist to record animal/plants specific details electronically. The captured data of this app is later updated to the server and can be used for various observations and analysis.

This product will be a rewritten and improved version of current LizCapApp mobile application. Since current LizCapApp is programmed in native Android and iOS platforms, it requires two separate codebases for maintenance, that’s why it is rewritten in Xamarin platform which internally converts it into these two mobile platforms. Since it will be rewritten completely from scratch, this would be a good time to remove some of the existing bugs and include new improvements in mobile app.

## References

Cross Platform definition from <https://en.wikipedia.org/wiki/Cross-platform>

Details of Xamarin Platform from <https://www.xamarin.com/>

UTM system definition from <https://en.wikipedia.org/wiki/Universal_Transverse_Mercator_coordinate_system>

IEE format from [here](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiR4L7ridbQAhVB5WMKHVWsBhEQFggdMAA&url=http%3A%2F%2Fwww.csc.villanova.edu%2F~tway%2Fcourses%2Fcsc4181%2Fs2010%2Fsrs_template-1.doc&usg=AFQjCNH5RCUtifVhnKm9Kfwnx6_Z2T5LzA&sig)

# Overall Description

## Product Perspective

Currently, Field Biologists use a survey mobile application available in both Android and iOS environments to collect data. One such application is already in use with name “LizCapApp”. This mobile application has a major problem: The source code of the application is developed natively in both the platforms. Two different source codes require two different teams with expertise in each platform to maintain and enhance the functionalities of the mobile application. This requires huge amount of effort and expertise and cost. We aim to utilize the capabilities of Cross Platforms for mobile application development to organize and develop a survey mobile application. So after careful evaluation it was decided to use Xamarin Platform to rewrite LizCapApp.

Once LizCapApp has captured details at the field, its data is being uploaded to a server and before going again on the field trip it will synch its data with the server.

## Product Functions

The Mobile Application LizCapApp provides following major functionalities:

1. It synchronizes (downloads) server data into mobile application local database. This action has to be performed by the user before the start of each field trip.
2. It collects user related details like recorder, handler and location of data collection.
3. It collects captured species related details like its taxonomy, body weights, heights etc.
4. It shows not synced data stored in mobile database for review and correction.
5. It synchronizes (uploads) recently captured species details in mobile application local database.

## User Classes and Characteristics

This mobile application will be used mainly by field biologists for flora/fauna surveys.

## Operating Environment

Data collection features of LizCapApp should operate in remote areas without internet connectivity. It will be used for syncing data with wifi or high speed internet connection. It will operate in handheld devices like mobile/tablet. Handheld devices will be either Android or iOS devices.

## Design and Implementation Constraints

LizCapApp should be programmed only in Xamarin platform for a single code base and generate mobile applications working natively in Android and iOS. There would be no internet connection in most of the survey fields so application should be able to perform its data collection activity without internet connection.

## User Documentation

User Guide will be provided with screenshots and instructions to use various functionalities of LizCapApp along with the developed mobile application software.

## Assumptions and Dependencies

This project depends completely on the correct conversion of Xamarin to Android and iOS mobile applications. It also uses different APIs and packages provided by Xamarin.

# External Interface Requirements

## User Interfaces

Since this is a rewriting of current LizCapApp, it will adopt and follow same user guidelines and controls. If any new feature is added or updated, then only user interface will change. To make it useable for other taxonomies and biologists UI should be dynamically created. Creation of UI fields and labels on them should be governed by Database fields initially setup by the user.

## Hardware Interfaces

Application should run on handheld devices like Mobile/tablet containing Android or iOS operating system. Application should be able to use device features of GPS, local storage, and power management to provide efficient functionalities.

## Software Interfaces

Mobile application should be able to upload/download data from database server during synchronization. Any bug or unusual activity should be reported immediately by the app to the software development team.

## Communications Interfaces

There is no restriction on data sharing mechanism and is completely dependent on the design decisions of developers.

# Application Features

The functional requirements are organized into following requirement categories:

## Data Collection

The mobile Application should be able to collect data during a field visit

4.1.1 Recorder

Mandatory field. A field to enter name/initials of the recorder; this will be the person responsible for doing survey.

4.1.2 Handler -mandatory

Mandatory field. A field to enter name/initials of the handler; this will be the person assisting recorder for doing survey by entering details in mobile applications. Recorder and handler can be the same person.

4.1.3 Site

Mandatory field. A named location where field data has been collected. It should be automatically recognized by current location of the device. It should also be able to support UMT system along with GPS system for finding location.

4.1.4 Array

Mandatory field. A named sub-location or trap where animal was captured. A list should be automatically populated after selection of Site.

4.1.5 Taxonomy

Mandatory field. Taxonomy of the animal captured. This should be a prepopulated list.

4.1.6 Species Code

Mandatory field for some species selected in Req. 4.1.5 while for others it will be an optional field and should not appear on the screen.

4.1.7 Look up Code

Mandatory and unique valued field for some species selected in Req. 4.1.5 while for others it will be an optional field and should not appear on the screen. This will be a tabular list of species code to reference for filling up Req. 4.1.6 value.

4.1.8 Fence Trap

Mandatory field. Prepopulated list of fences available in a particular array (Req. 4.1.4).

4.1.9 Fence Map

Mandatory field. Predefined map to reference for filling of fence trap (Req. 4.1.8) available in a particular array (Req. 4.1.4).

4.1.10 Recapture

Optional. To mark whether captured animal was previously captured.

4.1.11 Toe Clip Code

Unique code for every captured lizard in an array. C4 and D4 are never used. As they are essential for Lizards to move. Toe clip codes are unique to only an array of a site. Same toe clip code can be used at another array of a site.

Assumption: Arrays are far away from each other thus same lizard cannot cover the distance.

4.1.12 Toe Clip Code Map

A picture to reference toe clip code. It also suggests a possible unique code. Once a toe clip code is selected it checks its uniqueness against the mobile database. A toe clip code should be unique for a lizard in a particular site.

4.1.13 SVL

Optional. length of the animal captured. For Lizards and Snakes.

4.1.14 VTL

Optional. Length of the tail of the animal. For Lizards and Snakes.

4.1.14 Regen Tail?

Optional. Specific to Lizards

4.1.15 Hatchling?

Optional. True, if the captured animal is a hatchling, false otherwise.

4.1.16 Mass

Optional. Mass of the animal.

4.1.17 Sex

Mandatory. Male, Female, Unknown.

4.1.18 Dead?

Optional. True, if the captured animal is dead, false otherwise.

4.1.19 Comments

Optional. A text area to enter further details for the captured animal.

4.1.20 Review Screen

Mandatory. To see and review all the entered details of an animal at one place before moving on to another animal.

4.1.21 Look up Species

Mandatory for Arthropod. No need to capture weight and length of arthropods. Only number and species of arthropods needs to be stored.

4.1.22 Predator?

Optional. True, if the predator was present in trap along with arthropods, false otherwise.

4.1.23 HD-body

Optional. Present specifically for Amphibians. Instead of length this field is required.

4.1.24 Tap Status

Mandatory. 3 options possible: 1) Open, 2) Checked 3) Checked and Closed

4.1.25 Comments about this array:

Optional. Provide comments about this array.

4.1.26 OTL

Optional. Specific for Lizards.

## Sync

4.2.1 Database

Mandatory. 2 options 1) Live 2) Demo

4.2.2 Site

Mandatory field. A named location where field data was collected.

4.2.3 Connect

An option to connect to server database via internet/intranet to upload/download synchronize with mobile local database.

## UnSynced History

4.3.1 Show details of the animal captured in a list/cell format. Provide convenience to update any incorrect data before syncing to server database.

# Other Nonfunctional Requirements

## Performance Requirements

The mobile application should be able to collect data without internet connectivity. It should be able to sync its data with the data server within secs. It should not drain out enough battery power while using GPS system on the device.

## Safety Requirements

There is no harm or loss from the use of the product. There should not be loss of collected survey data from the app.

## Security Requirements

This app does not require any user identity authentication. Though it uses GPS system of the mobile to find current location of the user, it should not be broadcasted or shared with unknown device.

## Software Quality Attributes

The app should be easily adaptable to include new taxonomy of plants/animals. The attributes of the animal to be collected should be easily configured by end users. It should be easily modifiable and maintainable by a programmer.

## Business Rules

There is no role maintenance of the end users.

# Other Requirements

## Bug Tracking and Reporting

The application should be able to track app crashing and report in a well-documented manner to the developers.

Appendix A: Glossary

GPS: Global positioning system

Cross Platform: A software which can run on multiple computing platforms like in iOS and Android.

*UMT :* The **Universal Transverse Mercator** (**UTM**) [conformal projection](https://en.wikipedia.org/wiki/Map_projection#Projections_by_preservation_of_a_metric_property) uses a [2-dimensional](https://en.wikipedia.org/wiki/2-dimensional) [Cartesian coordinate system](https://en.wikipedia.org/wiki/Cartesian_coordinate_system) to give locations on the surface of the [Earth](https://en.wikipedia.org/wiki/Earth).

Appendix B: To Be Determined List

Please add any missing/new requirement to be addressed.