



# **FUNCTIONAL SPECIFICATION**

**DEPARTMENT OF ELECTRONIC ENGINEERING  
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**MENG YEAR 3**

**SOFTWARE ENGINEERING GROUP PROJECT**

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# 1. Introduction

## 1.1. Project and Scope

Our aim is to develop and sell an educational Android application to provide students of campus-based universities, and local members of the public, a means of identifying and learning about the local wildlife, initially only focusing on avian.

By providing potential future students with information on the wildlife that exists on campus, we are giving them the opportunity to fall in love with the university even prior to beginning their studies. Therefore, our target audience includes students that have interest in studying in a nature-surrounded environment in the UK.

In this project's scope, we will initially focus on supplying information regarding wildlife at The University of York. This will include images, videos, sounds and text which will act as a template that can be used to expand our application to cover any university in the UK. Users will be able to use the application as a journey of discovery, identifying different species of birds around the campus and learning about their characteristics, diet, location and fun facts. Users that purchase a guide licence will be able to upload & edit data from their desktop, allowing student societies and third-party providers to get involved in expanding the database of existing species and information.

Universities would benefit greatly from the application by increasing the likelihood that a potential student will choose the university as their place of study. Students seeking a calm, peaceful and natural environment that gives them the opportunity to release the stress associated with studying a degree will be motivated by the familiarity with local wildlife gained through our application. The application would also increase the university's revenue by attracting more bird watchers and curious members of the community to the campus and therefore income from sources such as parking and on-campus cafes would increase, while also engaging the community in the university, furthering its reputation.

## 2. System Overview

The system consists of an android user application, a desktop admin application and a database hosted on a remote server.

On the main user client, developed for Android, the user is presented with the home page containing a list of local wildlife species upon launching the application. From this page the user can change their location or view information about the application. Choosing a bird presents the user with a bird profile page containing the related information. Basing this application on android use allows the user to easily access the application while on the go while adhering to a strictly java based implementation.

A secondary guide admin client, developed for desktops, allows guides to create, read, update and delete information from the database. Due to this client giving access to the application's database, appropriate security measures need to be taken to ensure the validity of the user's intentions. This includes requiring an API key to access the client. Basing this application on desktop use allows for ease when editing information and adding content from file browsers.

Having an admin key on the admin client will give the required access for creating/removing API keys and creating/updating/removing locations.

## 2.1. Application Diagrams

### 2.1.1. Interface Diagram

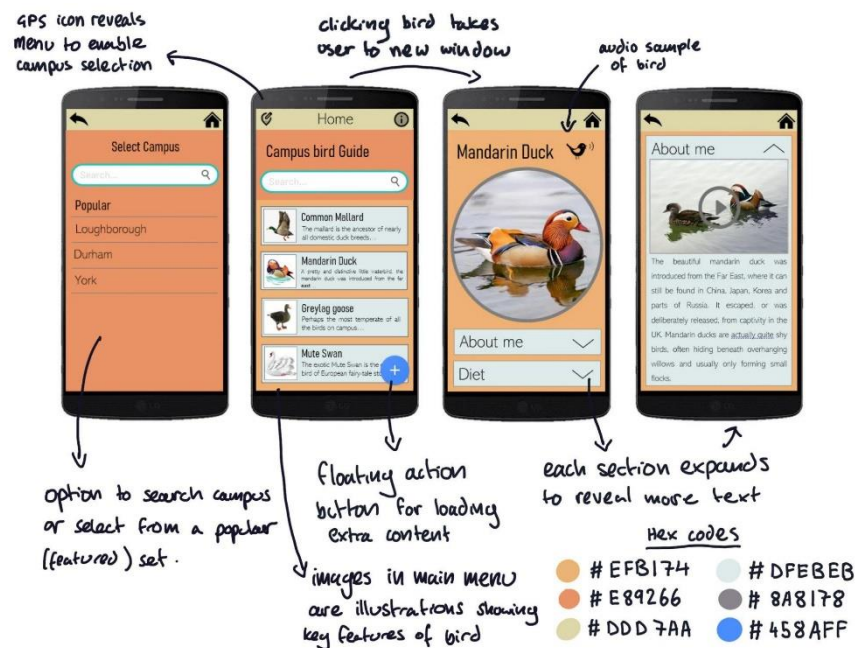


Figure 1 - Indicative interface diagram (demo of the app)

### 2.1.2. Data Flow Diagram

The diagram inserted below maps out the flow of information for the designed system:

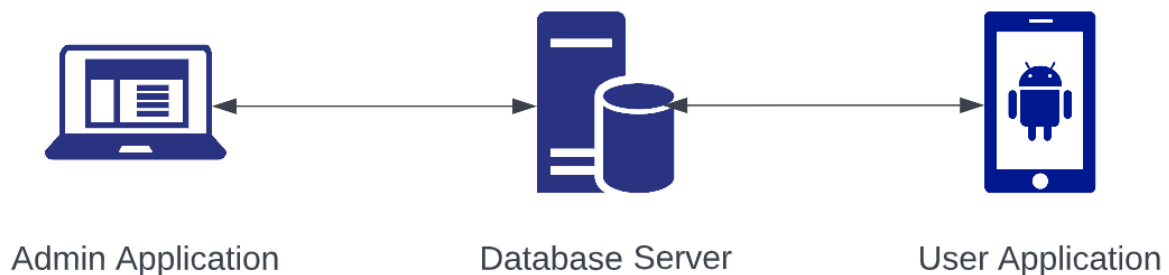


Figure 2 - Data Flow Diagram

The database server is the main source of data (it holds information that can be used later). The user application as well as the admin application communicate directly with the database server to read data such as wildlife information for this app. Both applications can request to view information and data can also be sent to the database server from the admin application.

## 2.2. User Roles and Responsibilities / Authority Requirements

User / Role	Example	Frequency of Use	Security/Access, Features used	Additional Notes
User	Students, Bird watchers	Frequent	Can view bird information.	
Admin	Groundskeepers, Bird Experts	Occasional	Can edit/create duck content. Requires API Key	
System Admin	Developers	Rare	Can create API keys and edit/add locations. Requires system access	

## 2.3. Dependencies

The functionality of the live application will depend on:

1. The media handlers written by a contracted third party
2. The server host being fully functional and having a stable connection
3. Reliable code that can be easily maintained as new Java and library updates are released
4. Complying with android app guidelines

## 3. Functional Specifications

### 3.1. User Client Application

<b>Purpose / Description</b>	Specifications related to the android client used by regular users. This includes the following pages: <ul style="list-style-type: none"><li>• Loading Page<ul style="list-style-type: none"><li>• This is the page the user will see before the content of the app is loaded</li></ul></li><li>• Landing Page/ Home Screen<ul style="list-style-type: none"><li>• Includes the list of birds</li><li>• Includes a button that enables the user to load additional content (additional birds)</li></ul></li><li>• Individual Bird Page<ul style="list-style-type: none"><li>• Includes all the information about the specific bird chosen by the user as well as some images and videos of the bird seen on campus</li></ul></li><li>• Campus Selection Page<ul style="list-style-type: none"><li>• Allows user to switch location/campus</li></ul></li></ul>
<b>Use Case</b>	This client will be used to identify birds and view related information
<b>Story ID:</b>	Functional Requirements / User Stories:
<b>1</b>	As a User, I can change the campus location on the user app to select which birds are viewed from the database
<b>2</b>	As a User, on the user app home page, I can view a list of birds by campus location which are stored on and received from the database
<b>3</b>	As a User, I can select a bird in the home page bird list to request and view details about the specific bird from the database
<b>4</b>	As a User, I can load from local storage a third-party provided bird presentation file into the user app
<b>5</b>	As a User, I can view instructions on the user app About Page describing how to use the user application

## 3.2 Admin Client Application

<b>Purpose / Description</b>	Specifications related to the desktop client used by regular admins and system admins.
<b>Use Case</b>	The regular admins will be able to create, read, update and delete information about birds in the database. The system admins will be able to create API keys and new locations as well as create, read, update and delete information about the birds in the database.
<b>Story ID:</b>	Functional Requirements / User Stories:
<b>6</b>	As a regular admin, through the admin app, I can create, read, update and delete a bird entry in the database
<b>7</b>	As a regular admin, through the admin app, I can create, read, update and delete a bird's assets
<b>8</b>	As a System Admin, I can create, read, update and delete a location on the database using the admin client
<b>9</b>	As a System Admin, I can create, read, update and delete API keys on the database using the admin client

## 4. System Configurations

To configure application:

User Client:	No configuration necessary. Download the app and launch to browse
Regular Admin Client:	Requires input of an API key
System Admin Client:	Requires An API key which has system admin level of access which can only be generated by System Admin Clients. The first system admin key must be manually generated through the server, however every key after would be generated by existing system admins.



## 5. Non-Functional Requirements

On the bird page of the user client, the following media is required:

Media Type	Media Description
Text	<ul style="list-style-type: none"><li>• Names of birds</li><li>• Description of birds</li><li>• Preferred location</li><li>• Diet</li><li>• Fun facts</li></ul>
Sound	<ul style="list-style-type: none"><li>• Characteristic sound of each bird</li></ul>
Images & Video	<ul style="list-style-type: none"><li>• Images and videos capturing each bird in its natural element</li></ul>

## 6. Deployment

Applications will be deployed on Amazon Web Services (AWS) as they can deliver a reliable service while adhering to suitable sustainability standards (see sustainability bill [1]). The entire server application and database can be implemented on AWS (or any other web hosting service if there is a price advantage).

We will deploy the user app on the android Google play store for users, and will manually send the admin application to admins with their respective key.

## References

1. Amazon, "Sustainability in the Cloud", Amazon Web Services, [Online]. Available: <https://sustainability.aboutamazon.co.uk/environment/the-cloud?energyType=true>