System Requirements Document 1.0
Client: Daintree (Group 7)
Project: Ocean Data Aggregation

Horizon Software (Group 2)

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Revision History

Name	Date	Reason for Changes	Version
RD – Initial Document	Jan. 30 2019	Transcribing RFP and elicitation notes to a structured document.	RD 0.7
RD – Formatted Sections	Feb. 1 2019	Formatting notes into sections and filling out more info.	RD 0.8
RD – First Complete Draft	Feb. 4 2019	All sections complete, ready for team review.	RD 0.9
RD – Final Copy	Feb. 5 2019	All sections complete and reviewed, ready for client reading.	RD 1.0
RSD 0.9 – First Draft	Feb. 12 2019	Made changes that Daintree requested when reviewing RD 1.1.	RSD 0.6
RSD 0.9 – Second Draft	Mar. 11 2019	Added diagrams.	RSD 0.7
RSD 0.9 – Third Draft	Mar. 12 2019	Consistency changes.	RSD 0.8
RSD 0.9 – Complete Draft	Mar. 12 2019	Final consistency changes, ready for client review.	RSD 0.9
RSD 1.0 – Post Feedback Draft	Mar. 18 2019	Added the changes requested by Daintree after RSD 0.9 feedback meeting.	RSD 0.9.1
RSD 1.0 – Final Copy	Mar. 19 2019	Final consistency changes, ready for client review.	RSD 1.0

1 Introduction

1.1 Purpose

This document describes the requirements and specified features for the Daintree Ocean Data Aggregation Project. The purpose of the Daintree Ocean Data Aggregation project is to improve the accessibility of Daintree's collection of data. Currently, the lack of a unified solution for data retrieval and visualization hinders user access to Daintree's collection of data. The Daintree Ocean Data Aggregation Project will result in the creation of a new data visualization system.

1.2 Project Scope

The Daintree Ocean Data Aggregation Project has two main objectives. The first objective is to visualize the data set(s) returned by the API. Currently when a customer asks to visualize a new data set, Daintree must develop a unique visualization solution. A centralized system to generate visualizations would benefit Daintree by reducing cost and time spent developing unique solutions for their customers. The second objective is to make visualizations easily accessible to users through a single interface. Making visualizations accessible would help more people make use of Daintree's collection of data and would align with Daintree's mission of supporting ocean education and public awareness.

The Daintree Ocean Data Aggregation project will look at the current system and the way that the current system allows a user to visualize data set(s). The Daintree Ocean Data Aggregation Project does not need to change the way that sensor readings are retrieved from sensors, how this data is stored, or how it is accessed from Daintree.

1.3 Glossary

Account Creation Page	Page where a user can create a new account.
Account Credentials	What a user enters into the DOD to log in to their account.
Account Information	Information about a user's account.
Account Information Page	Page where account information can be viewed and modified.
Admin Page	Page only accessible to an Admin User. Where sensor data classifications can be modified, other user accounts can be deleted, and other user accounts can be upgraded to an Admin User.
Admin User	A user type. An employee of Daintree who uses the DOD.
Annotation	Text comment which is linked to a single data point. Only a Paid User and an Admin User can create, delete, and view annotations.
Application Programming Interface (API)	A set of functions that programmatically access the contents of Daintree's databases. The API is an existing system which is maintained by Daintree.
Daintree	Client for the Ocean Data Aggregation Project.
Daintree's Collection of Data	Refers to all the measurements made by Daintree's sensors and stored by Daintree.

Daintree Ocean Dashboard (DOD)	The name of the system being specified in this document.
Dashboard Page	Main page of the DOD where a user can filter/search/view visualizations.
Data Classification	Every sensor has a data classification within the DOD. A sensor's data classification determines what user types are permitted to visualize a data set from the sensor. The classifications are: All users or Paid/Admin Users Only.
Data Point	A sensor reading at a specific point in time. Consists of a row in a Daintree database table, a single image, or a single video.
Data Set	A set of multiple data points from a single sensor ranging over a user-specified time range.
Filter Criteria	Filter criteria is created by a user to view a list of sensors matching the specified criteria. The sensors in the returned list can then be selected to generate a visualization of a data set. A filter criteria consists of location, sensor type, and time range.
Filter	A user selects one or more fields to match with one or more data sets.
Free User	A user type. A user who accesses the DOD free of charge. They do not have access to annotations and can only create visualizations from a subset of Daintree's sensors.
Horizon Software	A team of dedicated systems analysts and developers in the Software Engineering and Computer Science programs at the University of Victoria. Authors of this document.
Landing Page	A page where an incoming user begins. From the landing page, a user can access the login page and account creation page.
Login Page	Page where a user can enter their account credentials and gain access to the DOD.
Paid User	A user type. A user who pays for access to all sensors, and the annotations feature. A user becomes a Paid User by upgrading from a Free User.
Saved Visualizations Page	Page with a list of saved visualizations for a user.
Search	A user provides the DOD with one or more keywords to match with one or more data set(s).
Sensor	A tool that measures a single property of the physical world. Sensors create readings. Every sensor is uniquely identifiable through the API.
Sensor Type	A class of sensor. Some sensor type examples include: temperature, pressure, imagery, video, and radiation.

User Interface (UI)	The interface through which the user interacts with the software.
Visualization	A visual or graphical presentation of at least 1 and at most 50 data sets. A visualization of a temperature data set consists of a graph of temperature against time. A temperature data set can be combined with a pressure data set on the same graph. Images and videos cannot be combined with other data set(s). A visualization of an image consists of rendering the image for the user. A visualization of a video consists of rendering and playing the video for the user.

1.4 References

[1] Daintree Request for Proposals, [Online]

Available: https://sites.google.com/view/daintree-company/documents

[2] Daintree Ocean Division, [Online]

Available: https://sites.google.com/view/daintree-company/home

[3] Daintree Elicitation notes, [Online]

Available: https://kerfootj.github.io/seng321_designer/docs/Daintree%20Elicitation%20Notes.pdf

[4] Requirements Document 1.0 [Online]

Available: https://kerfootj.github.io/seng321_designer/docs/Requirements.pdf

[5] Requirements Document 1.1 [Online]

Available: https://sites.google.com/view/daintree-company/home

[6] RD 1.1 Feedback Meeting Notes [Online]

Available:
https://docs.google.com/document/d/1tiMmNPBjXOEr2PWAlo3rgOZH_CATZy3is_ENmKHwTqs/edit

[7] RSD 0.9 Feedback Meeting Notes [Online]

Available:
https://docs.google.com/document/d/1Vu10AeFcuYLFuzBNfcic3_vXKyXwbPJ1t2sImbPw5YA/edit

1.5 Overview

This document contains 7 sections and 3 appendices. Section 2 includes an overview of the current system, main product features are described along with project stakeholders, user types and assumptions about the API. Section 3 describes functional requirements, associated use cases, and associated sequence diagrams. Section 4 contains software systems the DOD must interact with. Section 5 outlines non-functional requirements. Section 6 shows analysis models along with descriptions. Finally, section 7 includes UI mock-ups with associated scenarios.

2 Overall Description

2.1 Product Perspective

Daintree maintains a network of sensors that measure various ocean conditions such as salinity, acidity and temperature. The measurements are collected, processed and stored by Daintree. The data stored by Daintree is accessible through their API. The existing system for creating visualizations involves making a custom application for each user which is inefficient and costly for Daintree.

The DOD currently being developed by Horizon Software is a replacement for Daintree's existing system for data visualization. The DOD will provide a single interface where the data set(s) can be visualized. With the DOD, no more custom applications will need to be developed.

The primary stakeholders for the Daintree Ocean Data Aggregation Project include Daintree, the users of the DOD, and the Horizon Software development team. Potential users of the DOD include research and educational organizations, students, ocean sensor suppliers, environmental agencies, and scientists.

2.2 Product Features

The major features of the DOD being developed by Horizon Software can be summarized as follows:

- Managing and creating accounts.
- Visualizations of data set(s).
- Creating, editing and viewing annotations on visualizations.
- Searching/Filtering for sensors by location, sensor type, and time range.
- Saving and loading visualizations.

2.3 User Types and Characteristics

There are three user types for the DOD: Free User, Paid User and Admin User. The user types are outlined below.

2.3.1 Free User

A Free User does not pay to use the DOD. The Free User typically consists of anyone who is curious about Daintree's collection of data. A Free User has limited access to Daintree's collection of data. A Free User may wish to save visualizations for future reference. They are not interested in reading or making annotations. It is assumed that each Free User will have varying levels of ocean domain knowledge.

2.3.2 Paid User

A Paid User pays to use the DOD. The Paid User has all the same functionality as a Free User, plus two additional features. The first additional feature is that a Paid User has access to Daintree's entire collection of data. A Paid User will also be able to view, create, edit, and delete annotations on visualizations. A Paid User could include the general public, students, researchers, and businesses.

2.3.3 Admin User

An Admin User manages the DOD. The Admin User has all the same capabilities of a Paid User, with four additional features. The first additional feature is an Admin User can modify which subset of data from Daintree's collection of data is available to a Free User by specifying a data classification. An Admin User can also delete any annotations from any user. An Admin User can delete other Admin, Free and Paid user accounts. Finally, an Admin User can upgrade a Free User account to Admin User.

2.4 Operating Environment

The DOD will request data from Daintree through their API. The DOD must therefore conform to the specifications for the API requests.

The users of the DOD are expected to access the DOD interface through their desktop machines. The DOD interface will therefore need to be accessible on major desktop environments: Windows, Mac OS, Linux, iOS, and Android.

2.5 Design and Implementation Constraints

Daintree is very flexible regarding the design and implementation of the DOD. The only constraint on the DOD is that it must be built on top of Daintree's existing API:

- C-1: The DOD must request data set(s) from Daintree's existing API.

2.6 Domain Assumptions

The DOD will be based on the following assumptions and dependencies as outlined below.

2.6.1 Assumptions

In order to generate reliable visualizations, the data set(s) sent to the DOD from the API must be reliable. If the API responses contain inconsistencies, the visualization being generated will be inconsistent. If the API responses contain errors, the visualizations will contain errors. It is not the responsibility of the DOD to notify Daintree of errors or correct these errors.

- A-1: The API responses provided by the API is free of inconsistencies and errors.
- A-2: Daintree never deletes a data set from their collection of data.
- A-3: Daintree never removes access to a data set.
- A-4: Stripe will notify admins when a Paid User successfully cancels their payments.
- A-5: Horizon Software will add the first Admin account manually when creating the DOD.
- A-6: All new data will be classified as Paid/Admin User only by default.
- A-7: Annotations on video are associated with a specific point in time in the video.

2.6.2 Dependencies

The DOD needs to access the data set(s) through the API. It is critical that the API is always available, and the API calls must not change. Should a change to the API specification occur, the DOD must be manually changed to match the new specification.

- D-1: The existing API is robust and consistent.

The DOD expects the data set(s) to be returned from the API in specific data formats (e.g. JSON, JPEG). The DOD must be built to accept data formats currently provided by the API. Any new data formats provided by the API will need to be added to the DOD manually.

- D-2: The DOD depends on the existing API's responding with consistent data formats.

3 System Features and Requirements

The DOD will include the following features: account management, to allow a user to create and manage their own account, and to allow an Admin User to manage other accounts as well; visualization of the data set(s), to present Daintree's collection of data in a meaningful way; filtering, to allow a user to refine Daintree's collection of data by location, time and sensor type; searching, to allow a user to search Daintree's collection of data for specific data set(s) by location, time and sensor type; and save, to allow a user to save and return to specific visualizations.

3.1 Account Management

3.1.1 Description and Priority

A user needs to be able to create, delete and manage their own account. Without accounts and the ability to manage accounts, there would be no way to distinguish which user is which. A user should have the ability upgrade to a Paid User or downgrade to a Free User.

Priority: Medium

3.1.2 Functional Requirements

- REQ-AM-1: A user must be able to create a Free User account.
- REQ-AM-2: A user must be able to log in to and log out of their account.
- REQ-AM-3: A user must be able to delete their account.
- REQ-AM-4: A user must be able to update account information.
- REQ-AM-5: A Free User must be able to upgrade their account to a Paid User account.
- REQ-AM-6: A Paid User must be able to downgrade their account to a Free User account.

3.1.3 Models

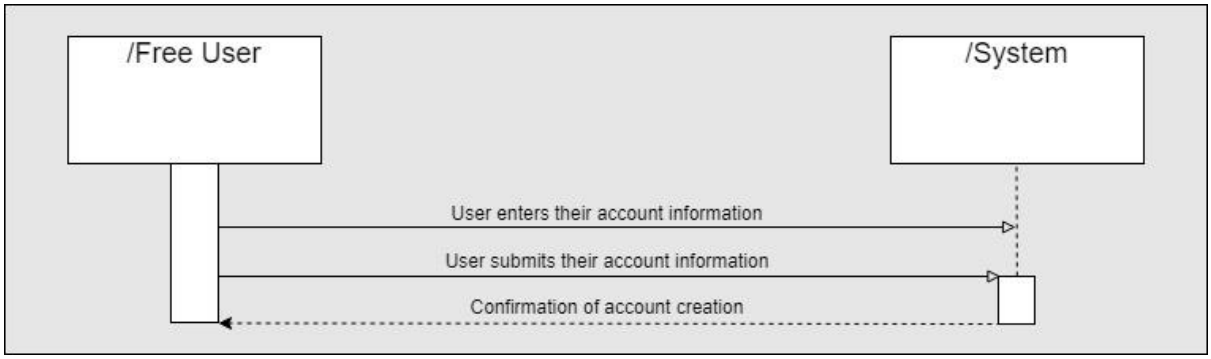
Use Case 1 – Create Account

Actors	A Free User
Preconditions	• The Free User has navigated to the account creation page from the landing page
Steps	• The Free User enters their account information • The Free User submits their account information
Success Conditions	• The Free User's account is created • The Free User is notified that a Free User account has been created • The user is logged into their account
Alternate Paths	2a. The Free User cancels account creation 2b. Account information is invalid

Use Case 1 corresponds to the following requirement:

- REQ-AM-1: A user must be able to create a Free User account.

Sequence Diagram 1 – Create Account



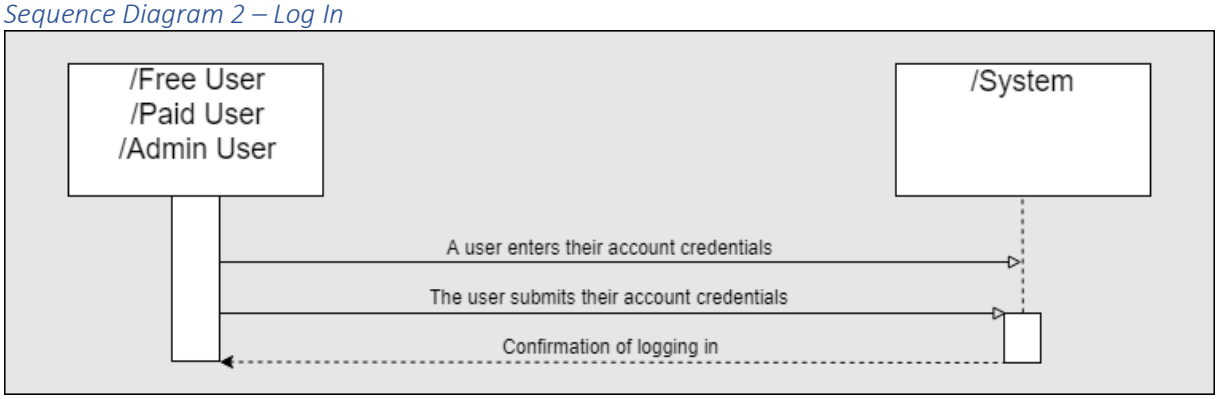
Use Case 2 – Log In

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is not logged in • The user has navigated to the login page from the landing page
Steps	1. The user enters their account credentials 2. The user submits their account credentials
Success Conditions	• The user is logged into their account
Alternate Paths	2a. Account credentials are invalid

Use Case 2 corresponds to the following requirement:

- REQ-AM-2: A user must be able to log in to and log out of their account.

Sequence Diagram 2 – Log In



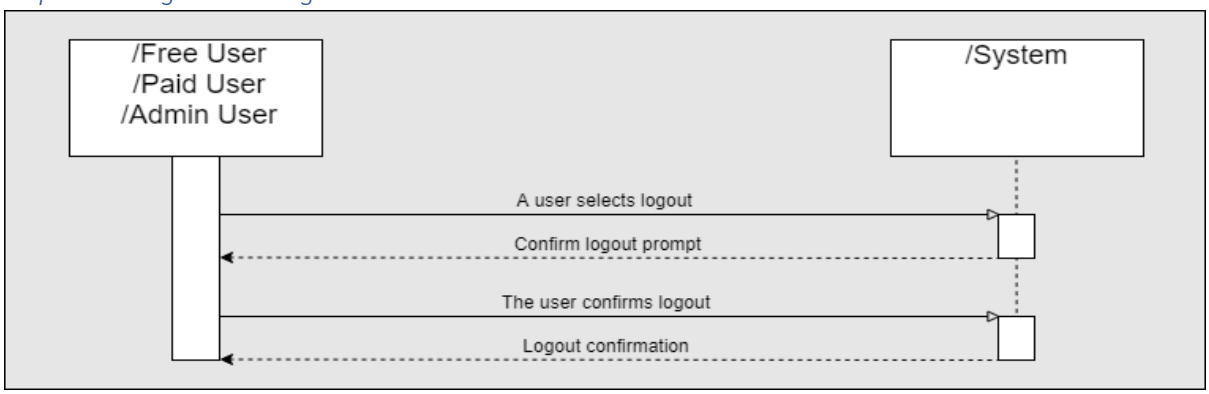
Use Case 3 – Log Out

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in
Steps	1. The user selects log out 2. The user confirms log out
Success Conditions	• The user is logged out of their account • The user is on the landing page
Alternate Paths	2a. The user cancels log out

Use Case 3 corresponds to the following requirement:

- REQ-AM-2: A user must be able to log in to and log out of their account.

Sequence Diagram 3 – Log Out



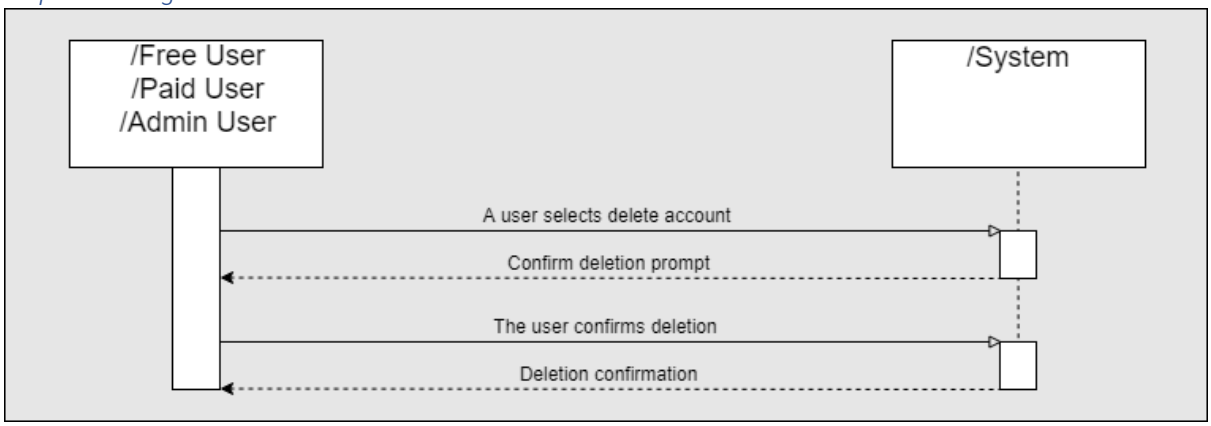
Use Case 4 – User Deletes Their Account

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in • The user has navigated to the account information page
Steps	1. The user selects delete account 2. The user confirms the deletion
Success Conditions	• The account is deleted • The user is notified that their account was deleted • The user is on the landing page
Alternate Paths	2a. The user cancels account deletion

Use Case 4 corresponds to the following requirement:

- REQ-AM-3: A user must be able to delete their account.

Sequence Diagram 4 – User Deletes Their Account



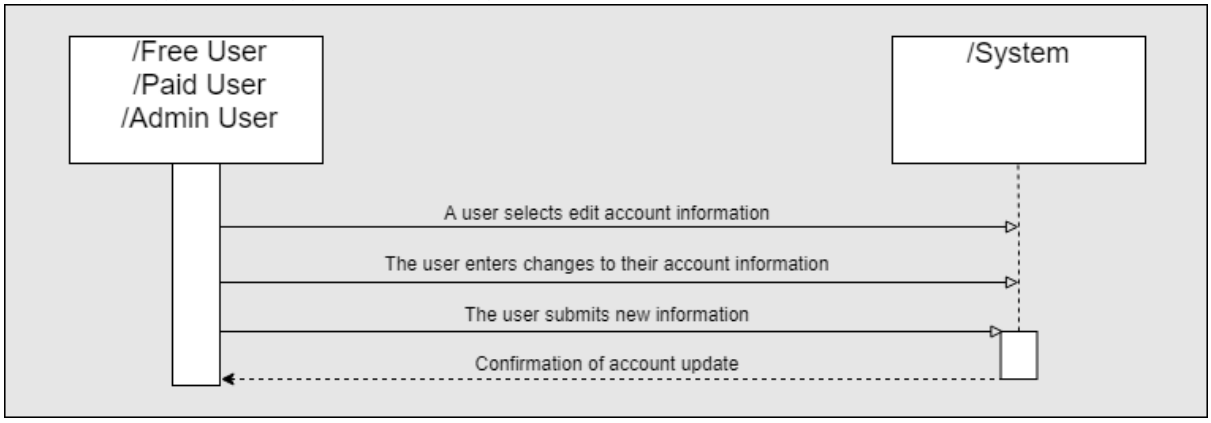
Use Case 5 – Update Account Information

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in • The user has navigated to the account information page
Steps	1. The user selects edit account information 2. The user enters changes to their account information 3. The user saves changes to their account information
Success Conditions	• The user's account information is updated • The user is notified that the update was successful
Alternate Paths	3a. The user cancels editing their account information

Use Case 5 corresponds to the following requirement:

- REQ-AM-4: A user must be able to update account information.

Sequence Diagram 5 – Update Account Information



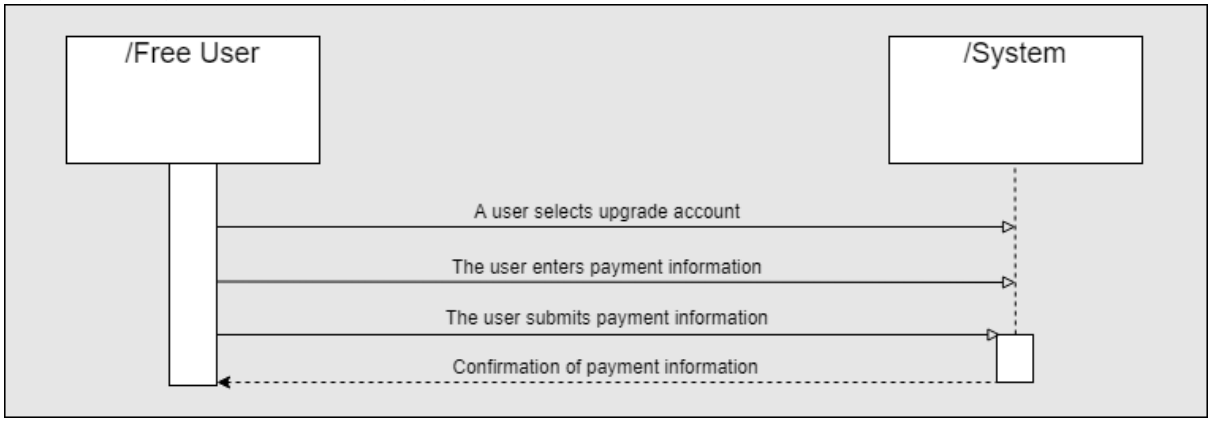
Use Case 6 - Free User Upgrades Their Account to Paid User Account

Actors	A Free User
Preconditions	• The Free User has a valid account • The Free User is logged in • The Free User has navigated to the account information page
Steps	1. The Free User selects upgrade account 2. The Free User enters payment information 3. The Free User submits their payment information
Success Conditions	• The Free User's account is upgraded to Paid User account • The Free User is notified that they are now a Paid User
Alternate Paths	3a. The Free User cancels upgrading their account 3b. Payment information is invalid

Use Case 6 corresponds to the following requirement:

- REQ-AM-5: A Free User must be able to upgrade their account to a Paid User account.

Sequence Diagram 6 - Free User Upgrades Their Account to Paid User Account



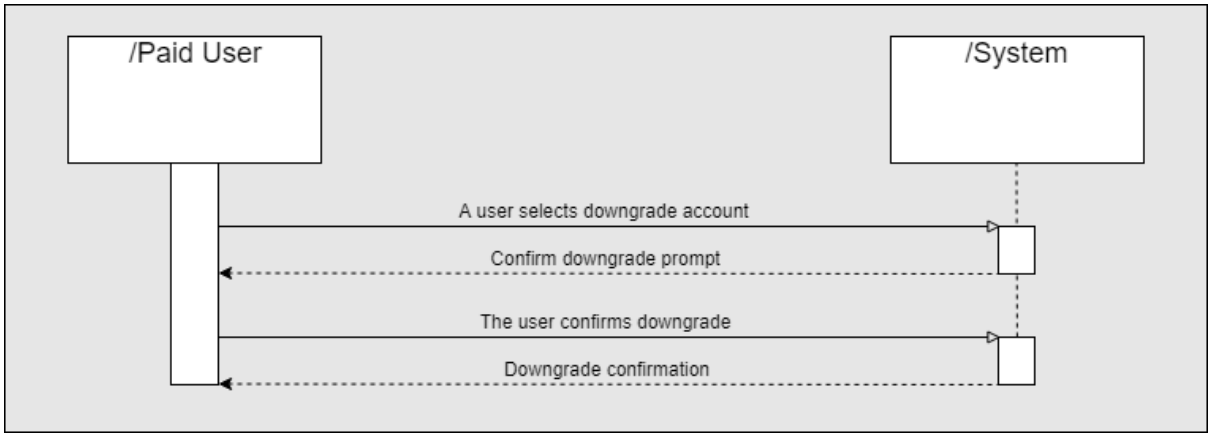
Use Case 7 - Paid User Downgrades Their Account to Free User Account

Actors	A Paid User
Preconditions	• The Paid User has a valid account • The Paid User is logged in • The Paid User has navigated to the account information page
Steps	1. The Paid User selects downgrade account 2. The Paid User confirms downgrade request
Success Conditions	• The Paid User's account is downgraded to Free User account • The Paid User is notified that they are now a Free User
Alternate Paths	2a. The Paid User cancels downgrading their account

Use Case 7 corresponds to the following requirement:

- REQ-AM-6: A Paid User must be able to downgrade their account to a Free User account.

Sequence Diagram 7 - Paid User Downgrades Their Account to Free User Account



3.2 Administration

3.2.1 Description and Priority

An Admin User must be able to delete a Free, Paid and Admin User's account; this feature is critical to the maintainability of the DOD. An Admin must also have the ability to upgrade a Free User to an Admin User.

Priority: High

3.2.2 Functional Requirements

- REQ-AD-1: An Admin User must be able to delete a Paid, Free and Admin User's account.
- REQ-AD-2: An Admin User must be able to upgrade a Free User's account to an Admin User account.
- REQ-AD-3: An Admin User must be able to modify the subset of data available to a Free User.

3.2.3 Models

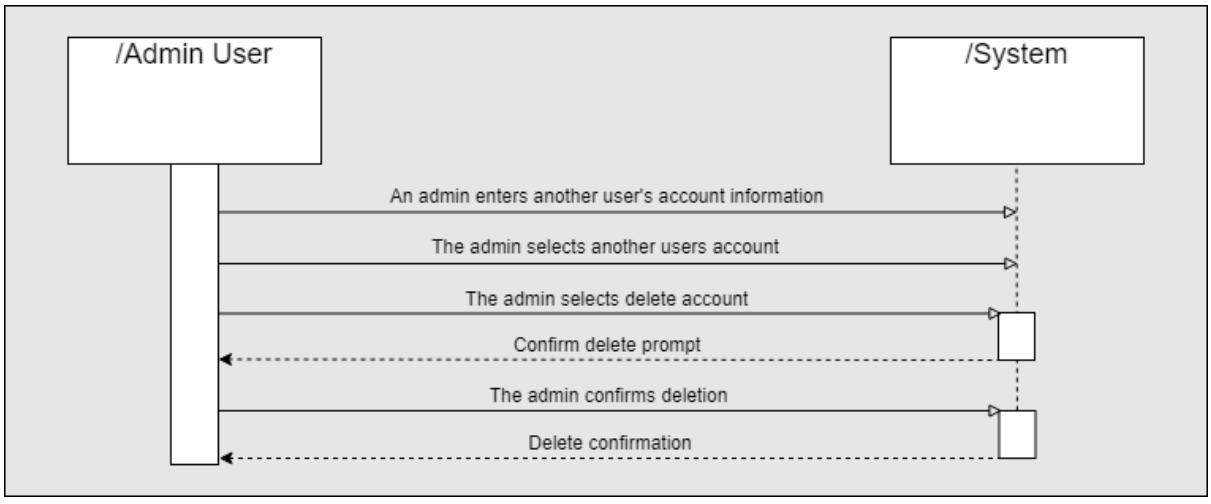
Use Case 8 - Admin User Deletes Another User's Account

Actors	An Admin User
Preconditions	• The Admin User has a valid account • The Admin User is logged in • The Admin User has navigated to the admin page
Steps	1. The Admin User enters another user's account information 2. The Admin User selects another user's account 3. The Admin User selects delete account 4. The Admin User confirms deletion
Success Conditions	• The account is deleted • The Admin User is notified that the account was deleted
Alternate Paths	4a. The Admin User cancels account deletion

Use Case 8 corresponds to the following requirement:

- REQ-AD-1: An Admin User must be able to delete another user's account.

Sequence Diagram 8 – Admin User Deletes Another User's Account



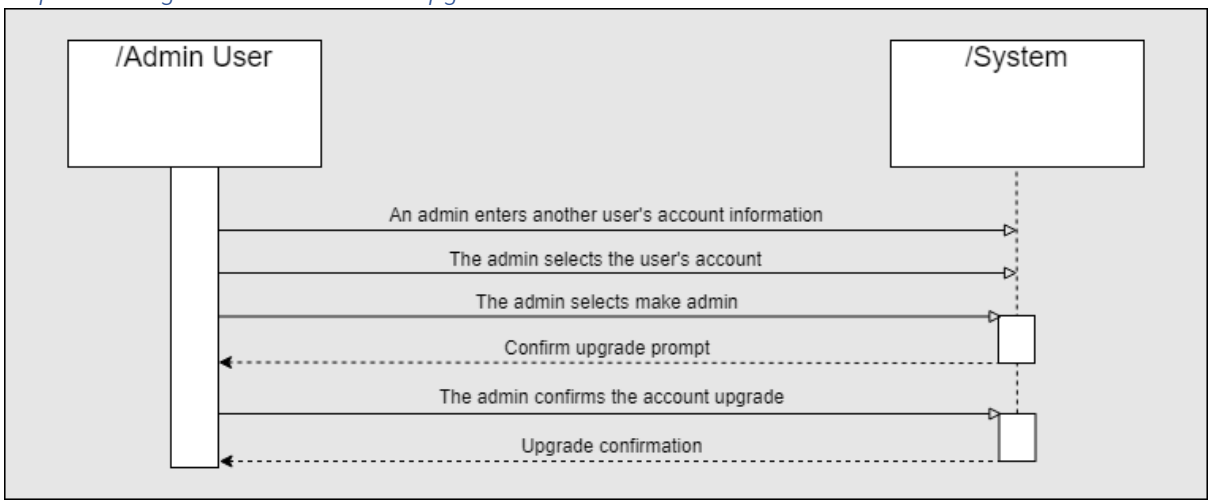
Use Case 9 - Admin User Upgrades a Free User's Account to Admin User Account

Actors	An Admin User
Preconditions	• The Admin User has a valid account • The Admin User is logged in • The Admin User has navigated to the admin page • The user to be upgraded has a valid Free User account
Steps	1. The Admin User enters the Free User's account information 2. The Admin User selects the Free User's account 3. The Admin User selects make admin 4. The Admin User confirms the account upgrade
Success Conditions	• The Free User's account is upgraded to Admin User account • The Admin User is notified that the account was upgraded
Alternate Paths	4a. The Admin User cancels account upgrade

Use Case 9 corresponds to the following requirement:

- REQ-AD-2: An Admin User must be able to upgrade a Free User's account to an Admin User account.

Sequence Diagram 9 - Admin User Upgrades a Free User's Account to Admin User Account



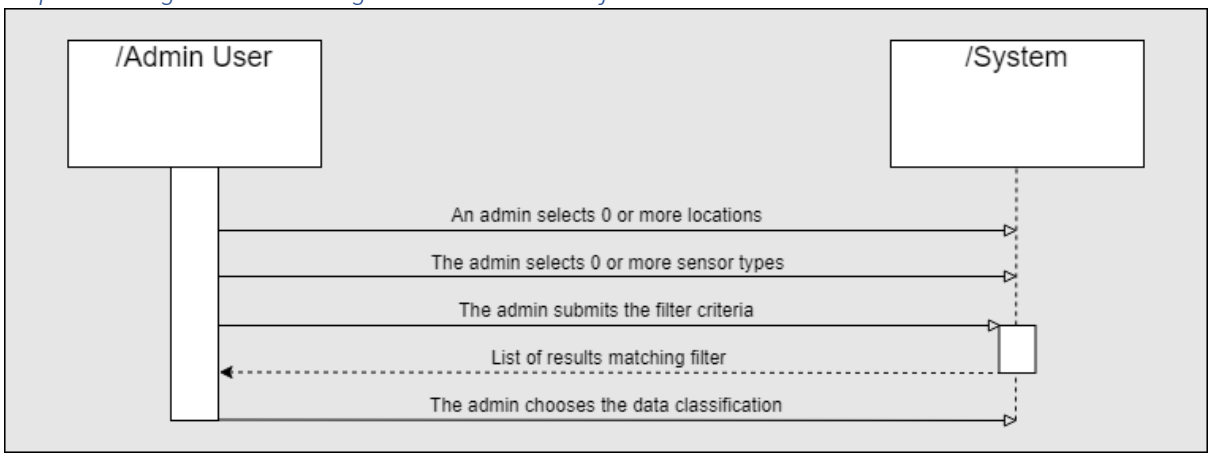
Use Case 10 - Manage Sensor Data Classification

Actors	An Admin User
Preconditions	• The Admin User has a valid account • The Admin User is logged in • The Admin User has navigated to the Admin page
Steps	1. The Admin User selects 0 or more locations 2. The Admin User selects 0 or more sensor types 3. The Admin User submits the filter criteria 4. The Admin User toggles the data classification for a sensor: All users, or Paid/Admin Users Only.
Success Conditions	• The sensor's data classification is updated • The Admin User is notified that the change was successful
Alternate Paths	N/A

Use Case 10 corresponds to the following requirement:

- REQ-AD-3: An Admin User must be able to modify the subset of data available to a Free User.

Sequence Diagram 10 - Manage Sensor Data Classification



3.3 Visualization

3.3.1 Description and Priority

The visualization of data set(s) is how a user can view and comprehend Daintree's collection of data. Without an effective way to visualize the data set(s), a user will be easily confused. A user must be able to visually compare different data set(s). Viewing multiple data sets overlaid on the same visualization can help a user recognize relationships between data sets. Seeing the relationships between multiple data sets promote education and awareness. Searching for sensors based on a certain sensor type, location or time is essential for a user who needs to find a specific data set from Daintree's collection of data.

Given a list of sensors, a user should be able to filter by location, time and sensor type. A user must be able to save visualizations. Saving visualizations is important because if a user finds data set(s) and a visualization of interest, that user may desire the ability to easily view the same visualization again at a later time.

Priority: High

3.3.2 Functional Requirements

- REQ-VI-1: A user must be able to select a data set(s) and have the DOD produce and display a visualization of the chosen data set(s).
- REQ-VI-2: A user must be able to play the videos collected by Daintree.
- REQ-VI-3: A user must be able to display the images collected by Daintree.
- REQ-VI-4: A user must have the option to overlay up to fifty data sets on the same visualization.
- REQ-VI-5: A user must have the option to view multiple visualizations on the same page.
- REQ-VI-6: A user must be able to search for sensors based on location(s), sensor type(s), and/or time range.
- REQ-VI-7: A user must be able to filter sensors based on location(s), sensor type(s), and/or time range.
- REQ-VI-8: A user must be able to save a visualization that they create.
- REQ-VI-9: A user must be able to display their saved visualizations.
- REQ-VI-10: A user must be able to delete their saved visualizations.

3.3.3 Models

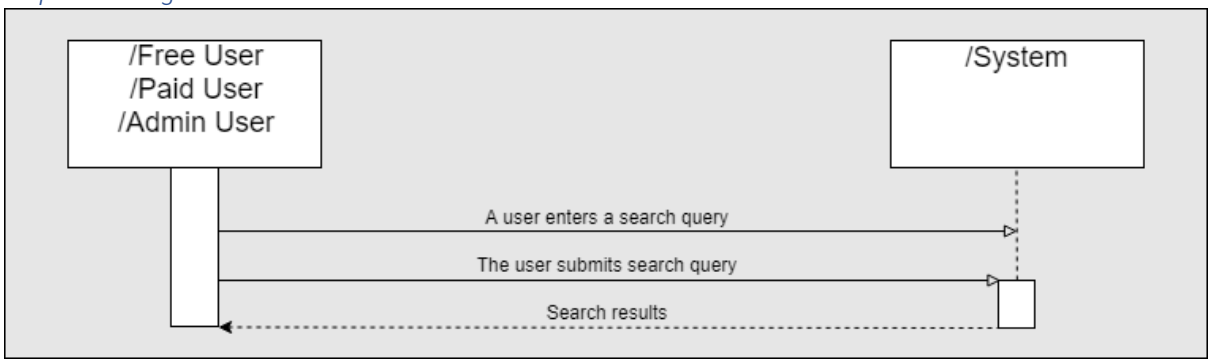
Use Case 11 - Search Data Sets

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in • The user has navigated to the dashboard page
Steps	1. The user enters a search query of keyword(s) 2. The user submits the search query
Success Conditions	1. Filter criteria is updated to match the keyword(s) in the user's search query 2. The user is presented with a list of sensors with location(s), sensor type(s), and time range that match the filter criteria
Alternate Paths	2a. If no available sensors have data set(s) that match the search query, then the user is notified

Use Case 11 corresponds to the following requirement:

- REQ-VI-6: A user must be able to search for sensors based on location(s), sensor type(s), and/or time range.

Sequence Diagram 11 - Search Data Sets



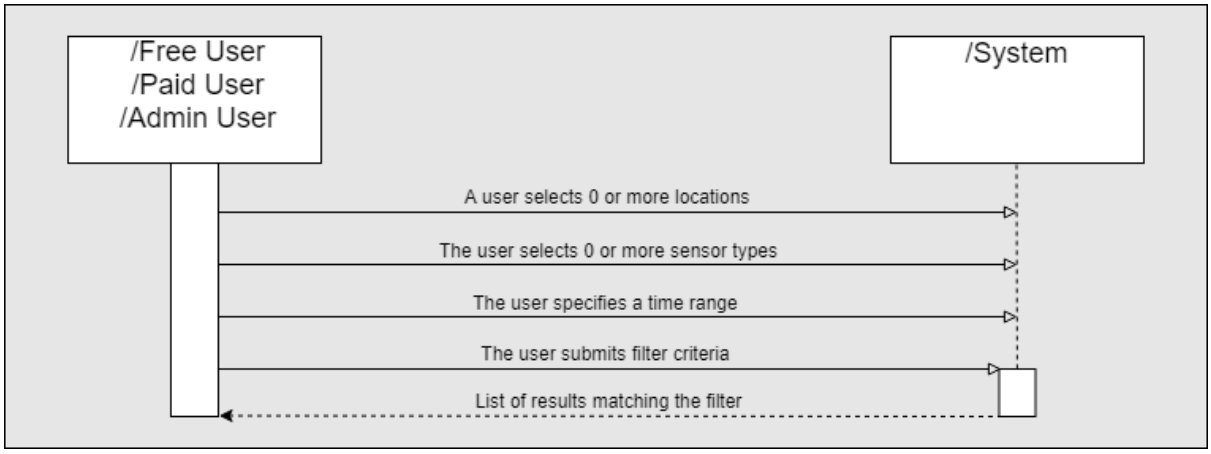
Use Case 12 - Filter Data Sets

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in • The user has navigated to the dashboard page
Steps	1. The user selects 0 or more locations 2. The user selects 0 or more sensor types 3. The user specifies a time range by selecting a start date and end date 4. The user submits the filter criteria
Success Conditions	• The user is presented with a list of sensors with location(s), sensor type(s), and time range that match the filter criteria
Alternate Paths	4a. If no available sensors have data set(s) that match the filter criteria, then the user is notified

Use Case 12 corresponds to the following requirement:

- REQ-VI-7: A user must be able to filter sensors based on location(s), sensor type(s), and/or time range.

Sequence Diagram 12 - Filter Data Sets



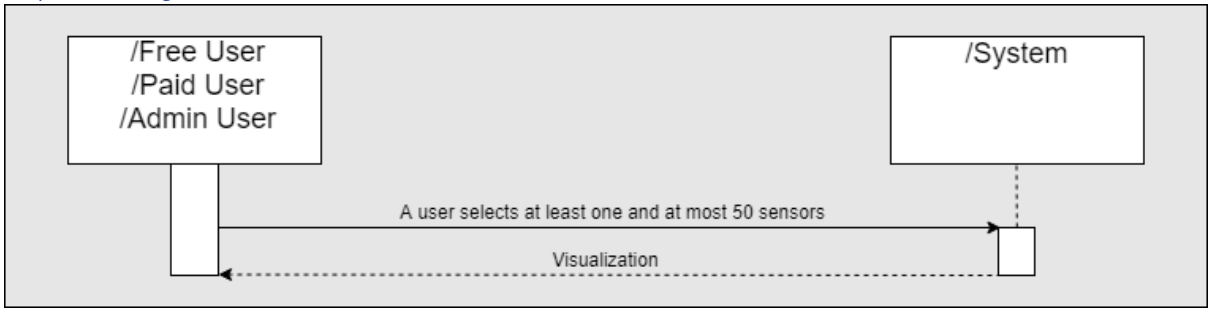
Use Case 13 – Create Visualization

Actors	A user (Free User, Paid User, Admin User)
Preconditions	N/A
Steps	1. *Extends Use Case 11 and/or Use Case 12* 2. The user selects at least one and at most fifty sensors from the presented list of sensors.
Success Conditions	• The user is presented with a visualization
Alternate Paths	2a. If the sensor type is photo or video, only one sensor can be selected per visualization 2b. The user removes sensors from the visualization

Use Case 13 corresponds to the following requirements:

- REQ-VI-1: A user must be able to select a data set and have the DOD produce and display a visualization of the chosen data set.
- REQ-VI-2: A user must be able to play the videos collected by Daintree.
- REQ-VI-3: A user must be able to display the images collected by Daintree.
- REQ-VI-4: A user must have the option to overlay up to fifty data sets on the same visualization.
- REQ-VI-5: A user must have the option to view multiple visualizations on the same page.

Sequence Diagram 13 – Create Visualization



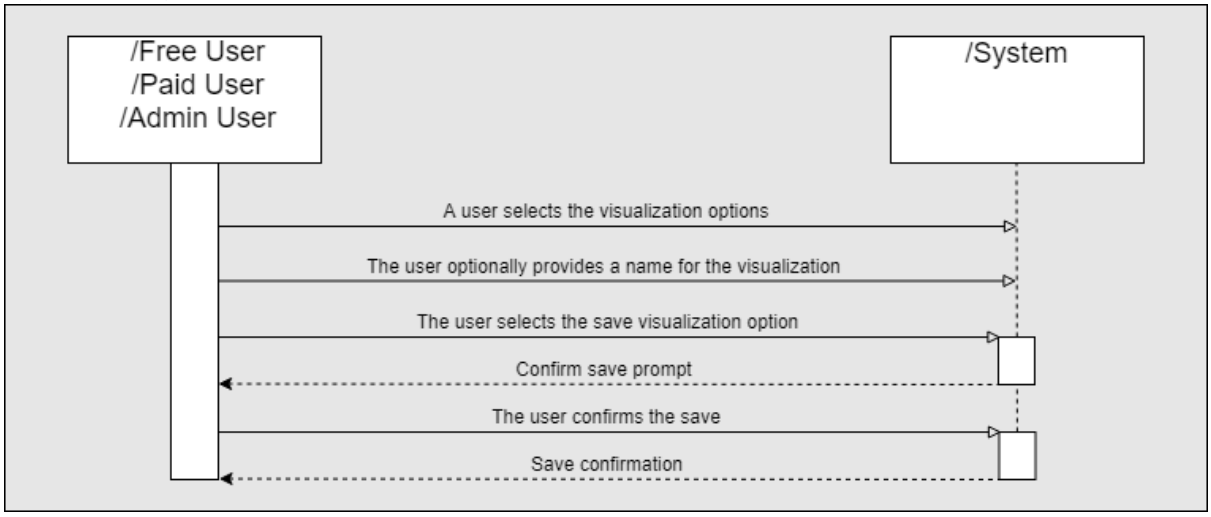
Use Case 14 – Save Visualization

Actors	A user (Free User, Paid User, Admin User)
Preconditions	N/A
Steps	1. *Extends Use Case 13* 2. The user selects the visualization options 3. The user enters an optional name for the visualization 4. The user selects the save visualization option 5. The user confirms the save
Success Conditions	• A visualization is saved and named • The user is notified that the save was successful
Alternate Paths	5a. The user cancels the save visualization process

Use Case 14 corresponds to the following requirement:

- REQ-VI-8: A user must be able to save a visualization that they create.

Sequence Diagram 14 – Save Visualization



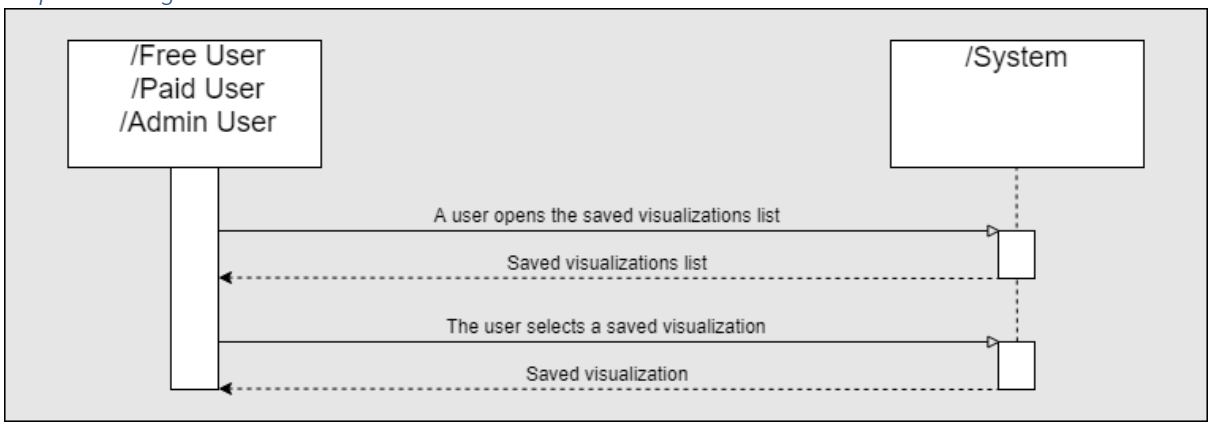
Use Case 15 – Load Visualization

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in • The user has navigated to the saved visualizations page • The user has at least one saved visualization
Steps	1. The user opens the saved visualizations list 2. The user selects a saved visualization
Success Conditions	• The user is presented with the saved visualization
Alternate Paths	2a. The visualization cannot be generated as the user's account type does not match the data classification for one or more sensors. The user is notified that they do not have permission to view the data set(s) anymore.

Use Case 15 corresponds to the following requirement:

- REQ-VI-9: A user must be able to display their saved visualizations.

Sequence Diagram 15 – Load Visualization



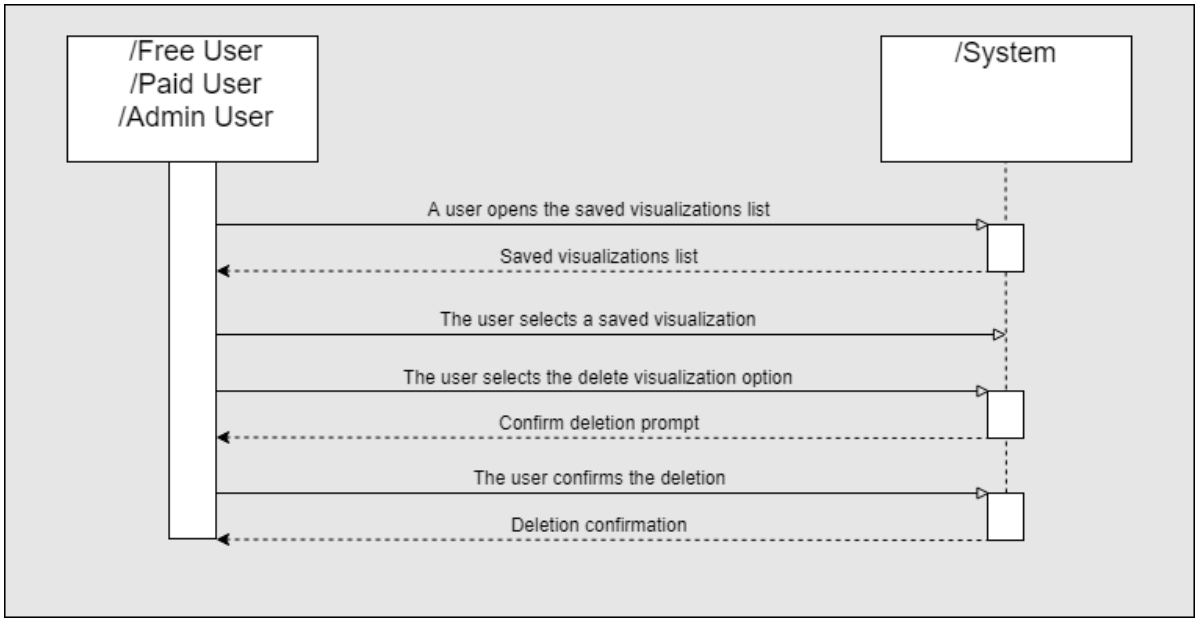
Use Case 16 – Delete Saved Visualization

Actors	A user (Free User, Paid User, Admin User)
Preconditions	• The user has a valid account • The user is logged in • The user has navigated to the saved visualizations page • The user has at least one saved visualization
Steps	1. The user opens the saved visualizations list 2. The user selects a saved visualization 3. The user selects delete visualization 4. The user confirms the deletion
Success Conditions	• The selected visualization is removed from the user's saved visualizations • The user is notified that the deletion was successful
Alternate Paths	4a. The user cancels the deletion process

Use Case 16 corresponds to the following requirement:

- REQ-VI-10: A user must be able to delete their saved visualizations.

Sequence Diagram 16 – Delete Saved Visualization



3.4 Annotation

3.4.1 Description and Priority

Paid and Admin Users must be able to annotate data points, images and videos. Annotating is important as it allows Paid and Admin Users to indicate anomalies or points of interest.

Priority: Low

3.4.2 Functional Requirements

- REQ-AN-1: Paid and Admin Users must be able to create their own annotations on videos, images and data points from a data set.
- REQ-AN-2: Paid and Admin Users must be able to toggle annotations on and off.
- REQ-AN-3: A Paid User must be able to delete their own annotations.
- REQ-AN-4: An Admin User must be able to delete any annotation.
- REQ-AN-5: Paid and Admin Users must be able to modify their own annotations.
- REQ-AN-6: Paid and Admin Users must be able to view any annotations.

3.4.3 Models

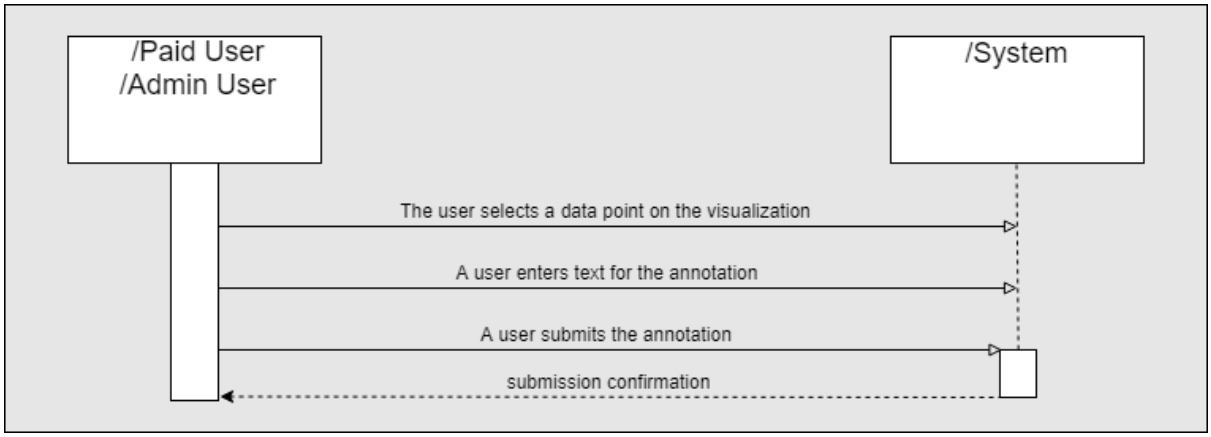
Use Case 17 - Create Annotation

Actors	A user (Paid User, Admin User)
Preconditions	N/A
Steps	1. Extends Use Case 13 or Use Case 15 2. The user selects a data point on the visualization 3. The user enters the text for the annotation 4. The user submits the annotation
Success Conditions	• The annotation is saved and linked to the selected data point • The user is notified that the annotation was created successfully
Alternate Paths	4a. The user cancels the annotation process

Use Case 17 corresponds to the following requirement:

- REQ-AN-1: Paid and Admin Users must be able to create their own annotations on videos, images and data points from a data set.

Sequence Diagram 17 - Create Annotation



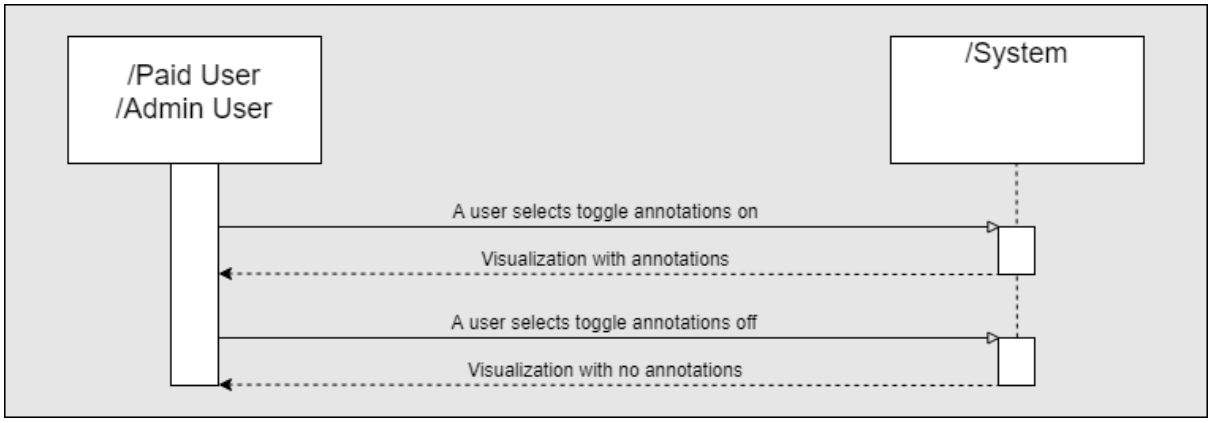
Use Case 18 - Toggle Annotations

Actors	A user (Paid User, Admin User)
Preconditions	N/A
Steps	1. Extends Use Case 13 or Use Case 15 2. The user selects toggle annotations on
Success Conditions	• Visualization is updated to display any existing annotations on the data points
Alternate Paths	2a. The user selects toggle annotations off, the visualization is updated to not display annotations

Use Case 18 corresponds to the following requirement:

- REQ-AN-2: Paid and Admin Users must be able to toggle annotations on and off.
- REQ-AN-6: Paid and Admin Users must be able to view any annotations.

Sequence Diagram 18 - Toggle Annotations



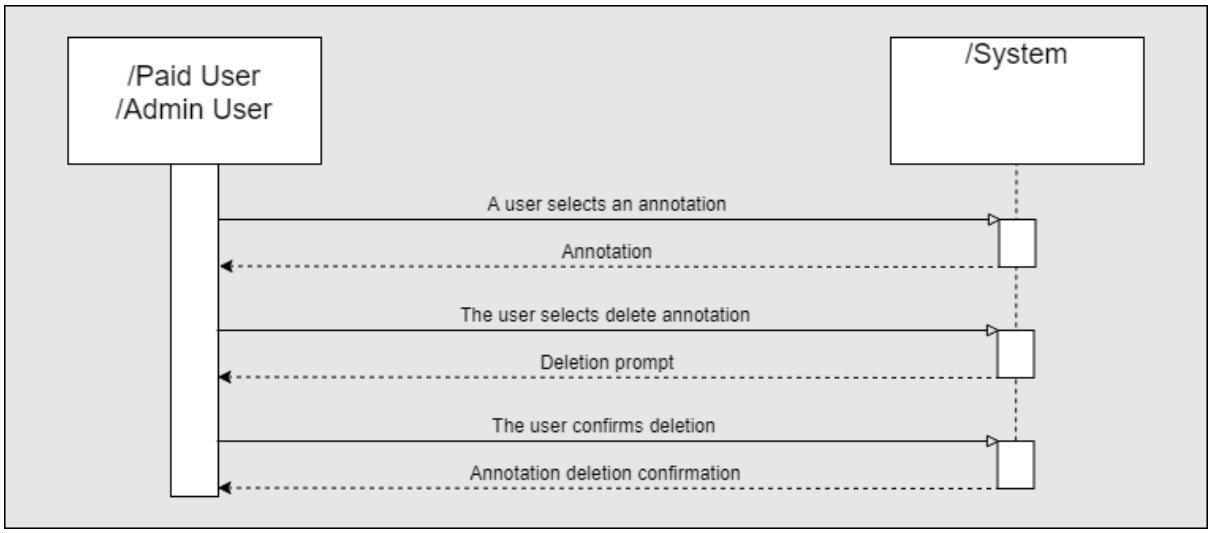
Use Case 19 - Delete Annotation

Actors	A user (Paid User, Admin User)
Preconditions	• If the user is a Paid User, then they must be the author of the selected annotation in order to delete it
Steps	1. *Extends Use Case 18* 2. The user selects an annotation 3. The user selects delete annotation 4. The user confirms deletion
Success Conditions	• The selected annotation is deleted • The user is notified that the deletion was successful
Alternate Paths	4a. The user cancels the deletion

Use Case 19 corresponds to the following requirements:

- REQ-AN-3: A Paid User must be able to delete their own annotations.
- REQ-AN-4: An Admin User must be able to delete any annotation.

Sequence Diagram 19 - Delete Annotation



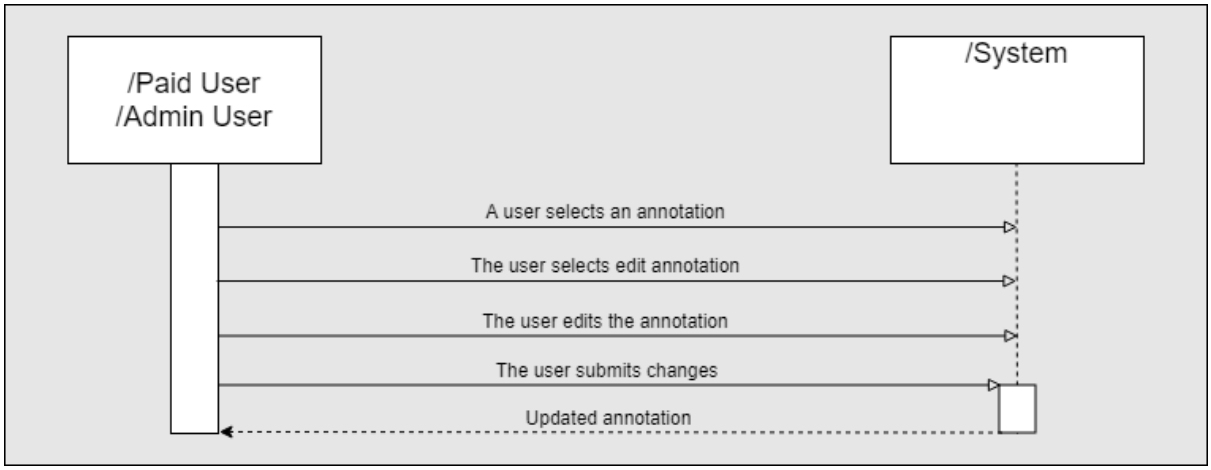
Use Case 20 - Edit Annotation

Actors	A user (Paid User, Admin User)
Preconditions	• The user must be the author of the selected annotation in order to edit it
Steps	1. *Extends Use Case 18* 2. The user selects an annotation 3. The user selects edit annotation 4. The user changes the annotation 5. The user submits their changes
Success Conditions	• The selected annotation is updated • The user is notified that the update was successful
Alternate Paths	5a. The user cancels the update process

Use Case 20 corresponds to the following requirements:

- REQ-AN-5: Paid and Admin Users must be able to modify their own annotations.

Sequence Diagram 20 - Edit Annotation



4 External Interface Requirements

4.1 Communication Interfaces

Daintree's existing API provides a means of programmatically accessing Daintree's collection of data. The DOD will access the API to find sensor types and locations from which Daintree collects data. The DOD will access the API to access Daintree's collection of data.

Communication with the API occurs over Hypertext Transfer Protocol (HTTP). Because of the large amount of data that can be transferred, data transfer rates are dependent upon the speed of the API.

4.2 Software Interfaces

The DOD must integrate with Stripe, an external payment service provider. Stripe is used to upgrade from a Free User to a Paid User. Stripe stores payment information if the user chooses for Stripe to remember their payment information. When a Free User upgrades to Paid User for the first time, the DOD receives a token from Stripe to associate with that user for future payments.

5 Non-Functional Requirements

5.1 Performance Requirements

The following section specifies the efficiency requirements that the DOD must meet.

5.1.1 Efficiency

- REQ-EF-1: The DOD must be capable of visualizing data set(s) within 3 seconds of receiving the data set(s) from the API.
- REQ-EF-2: The DOD must be capable of handling up to one GB of data requested from the API.

5.2 Security Requirements

User data security is important for all user types. A Free User must have access to only a limited subset of data provided by Daintree. A user only ever views a visualization of the data set and not the data set itself. Payment transactions must be secure so that the Paid User is comfortable using the DOD. Storage of a user's account credentials must be secure. A user must enter correct account credentials to access their account.

- REQ-AS-1: A Free User can only access data set(s) from a limited subset of sensors.
- REQ-AS-2: A user must not be able to view data set(s), but only visualizations of data set(s).
- REQ-AS-3: Payment transactions must be secure between the Paid User and the DOD.
- REQ-AS-4: Storage of a user's account credentials must be secure.
- REQ-AS-5: A user must provide a correct set of account credentials to access an account.

5.3 Software Quality Attributes

The following sections outline the quality attributes the DOD must meet including: adaptability, portability, usability, and reliability.

5.3.1 Adaptability

If Daintree starts collecting data (or data points) from a new sensor, the DOD must adapt to accomodated the data from the sensor. It is essential a Paid and Admin User has access to the new data. It is important that new sensors added by Daintree do not disrupt the DOD.

- REQ-ADPT-1: The DOD must require few to no changes when new sensors are added by Daintree.
- REQ-ADPT-2: An Admin or Paid User must be able to use data collected by new sensors as soon as it available from the API.

5.3.2 Portability

In order to support a wider range of user devices, the DOD must run on desktop, tablet, and mobile devices.

- REQ-PO-1: A user must be able to access the DOD on desktop and mobile platforms.

5.3.3 Usability

The DOD needs to provide a level of usability such that a user with limited technical knowledge is able to use the DOD.

- REQ-US-1: A new user to the DOD must be able to find the data set(s) they are interested in within 3 minutes.

5.3.4 Reliability

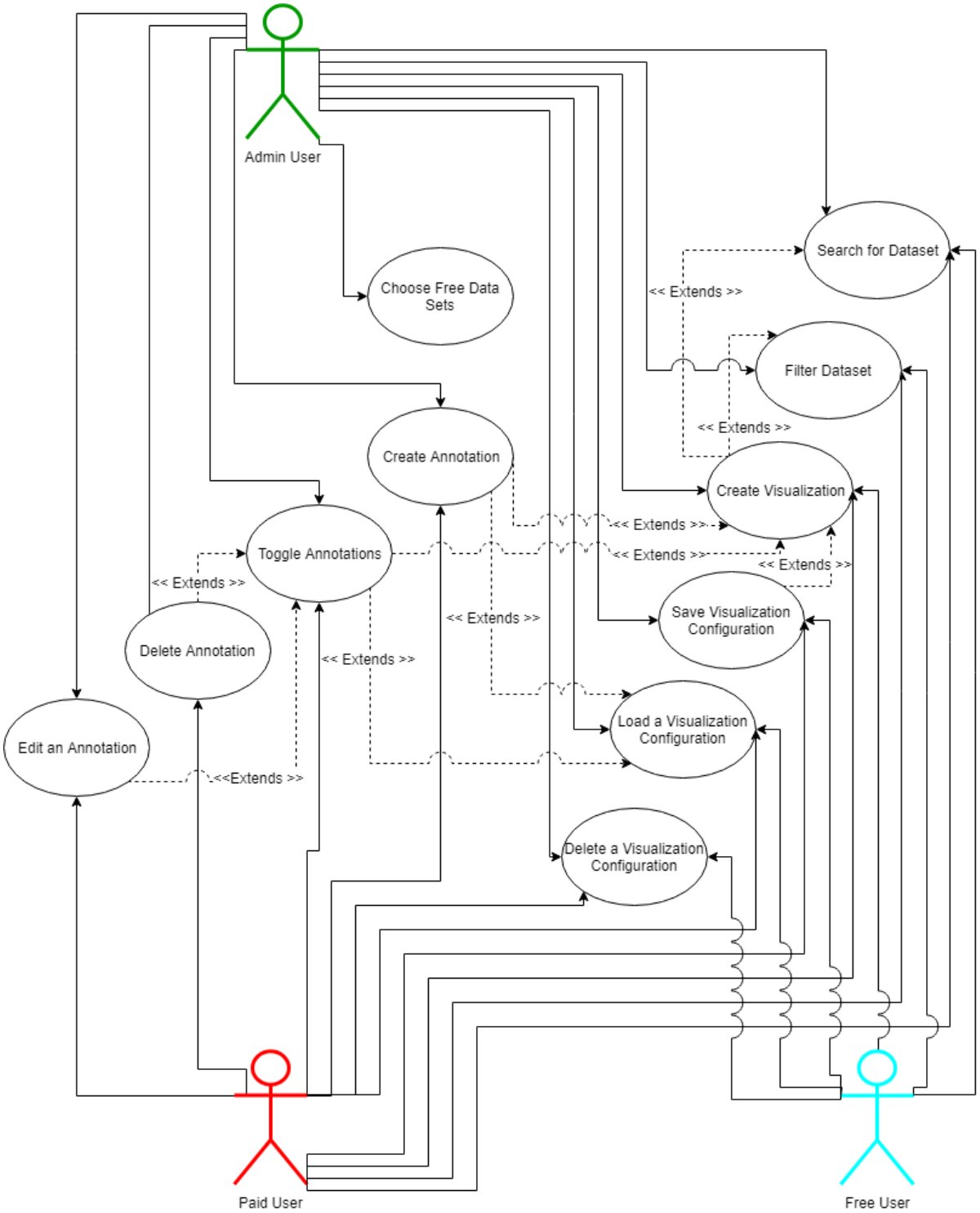
- REQ-RE-1: The DOD must not modify Daintree's collection of data when generating visualizations.
- REQ-RE-2: For a specific filter criteria, the DOD must always return the same data sets unless a sensor has been added or removed.

6 Analysis Model

6.1 Use Case Model

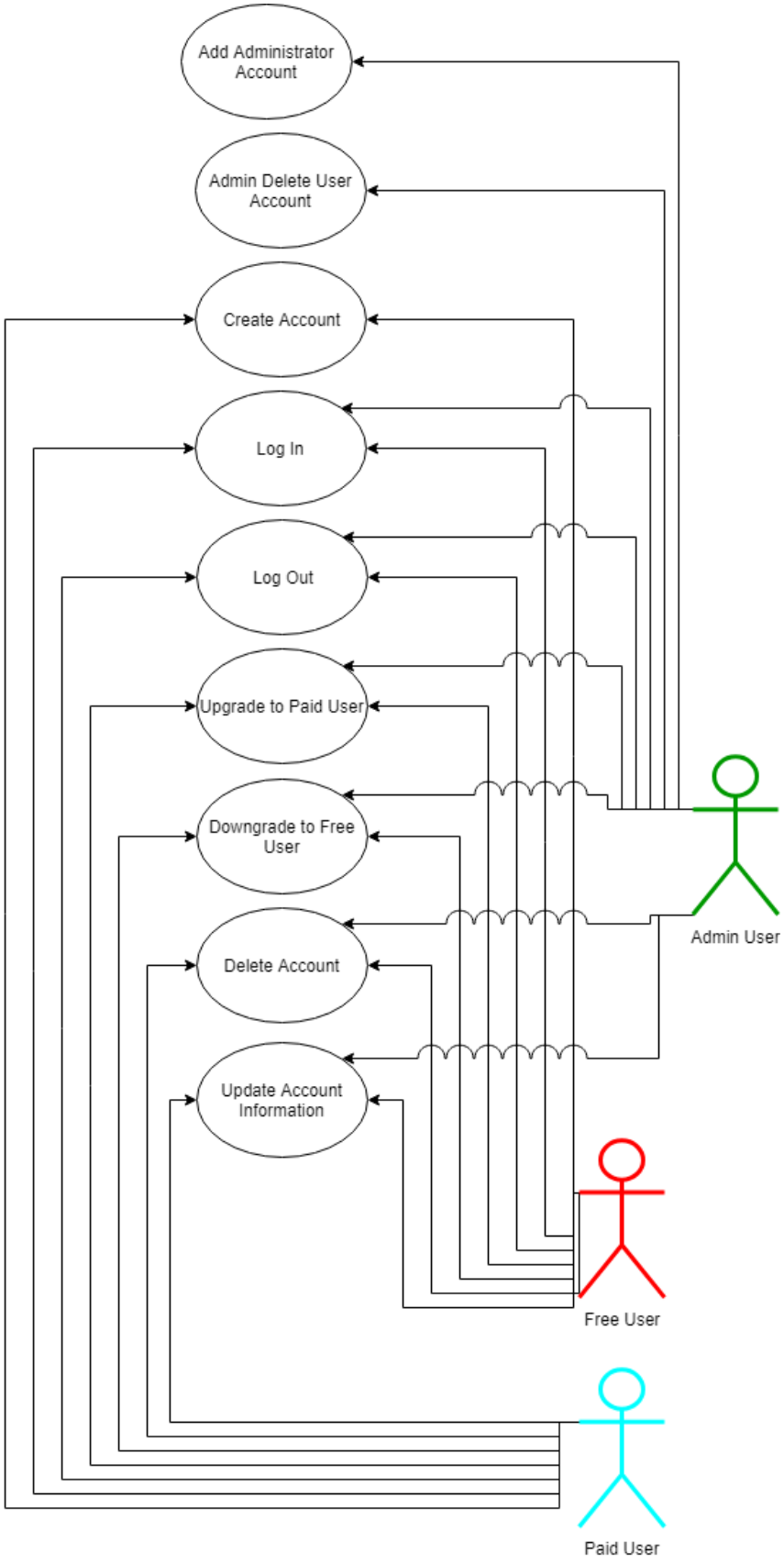
The following diagram, the Use Case Model part 1, shows the relationships between the users and the use cases regarding visualization and annotations.

Use Case Model Part 1



The following diagram, the Use Case Model part 2, shows the relationships between the users and the use cases regarding account management.

Use Case Model Part 2



6.2 Data Flow Assumptions

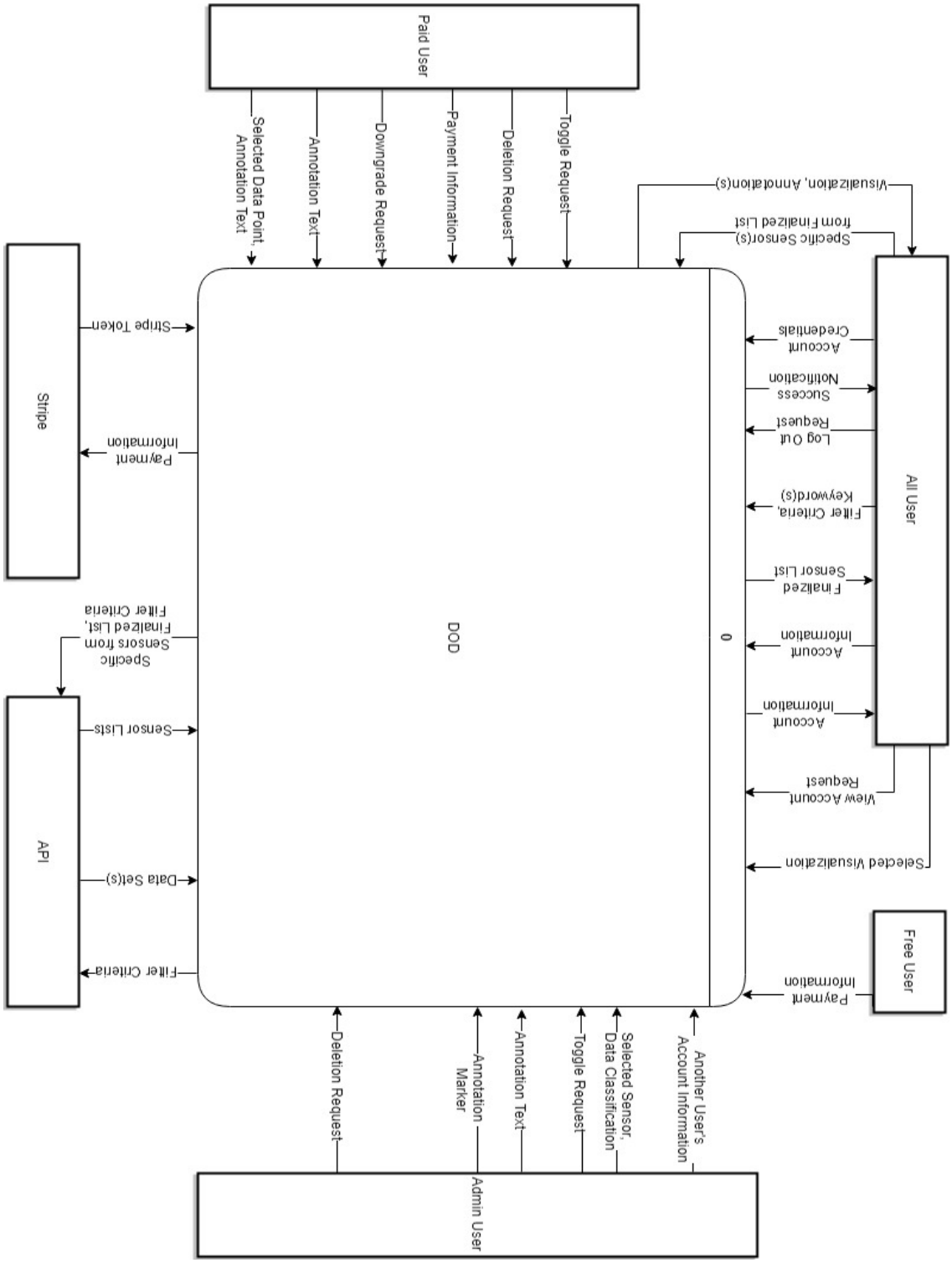
The assumptions below were made with the intention to increase clarity and focus on the fundamental data flows through the DOD. To properly understand the data flow diagram, the following assumptions must be understood:

- The DOD keeps track of user information. In other words, the DOD is aware of which user is logged in and which user is making what request.
- Each data flow starts from the precondition(s) of the corresponding use case.
- When 'Annotation Text' is passed into the DOD, the DOD knows which data points are currently being visualized. This assumption is made because viewing a visualization is a prerequisite for toggling/viewing/editing/deleting annotations.
- In relevance to process 2.2 (Delete Account), an Admin User can delete a Free, Paid or Admin User's account.
- 'All users' consists of Free Users, Paid Users and Admin Users.
- 'API' represents the Daintree API.

6.3 Context Diagram

This diagram is a high-level representation of the DOD. The context diagram for the DOD contains one process, which is representative of the DOD as a whole. The context diagram contains all data flows required for the features outlined in section 2 and 3. The diagram below has the Free User, Paid User and Admin User actors. The DOD interacts with the Daintree API and Stripe external entities.

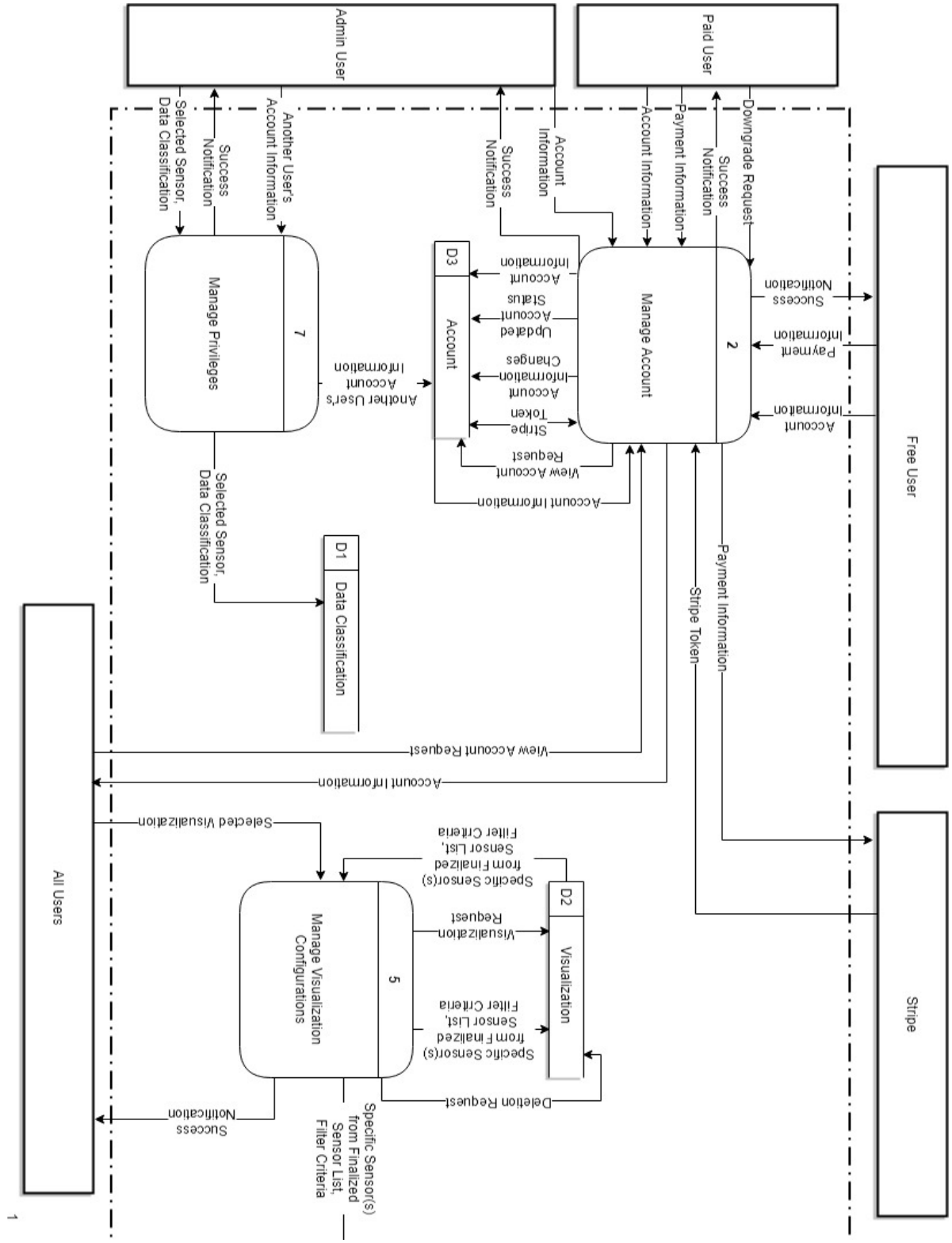
Context Diagram

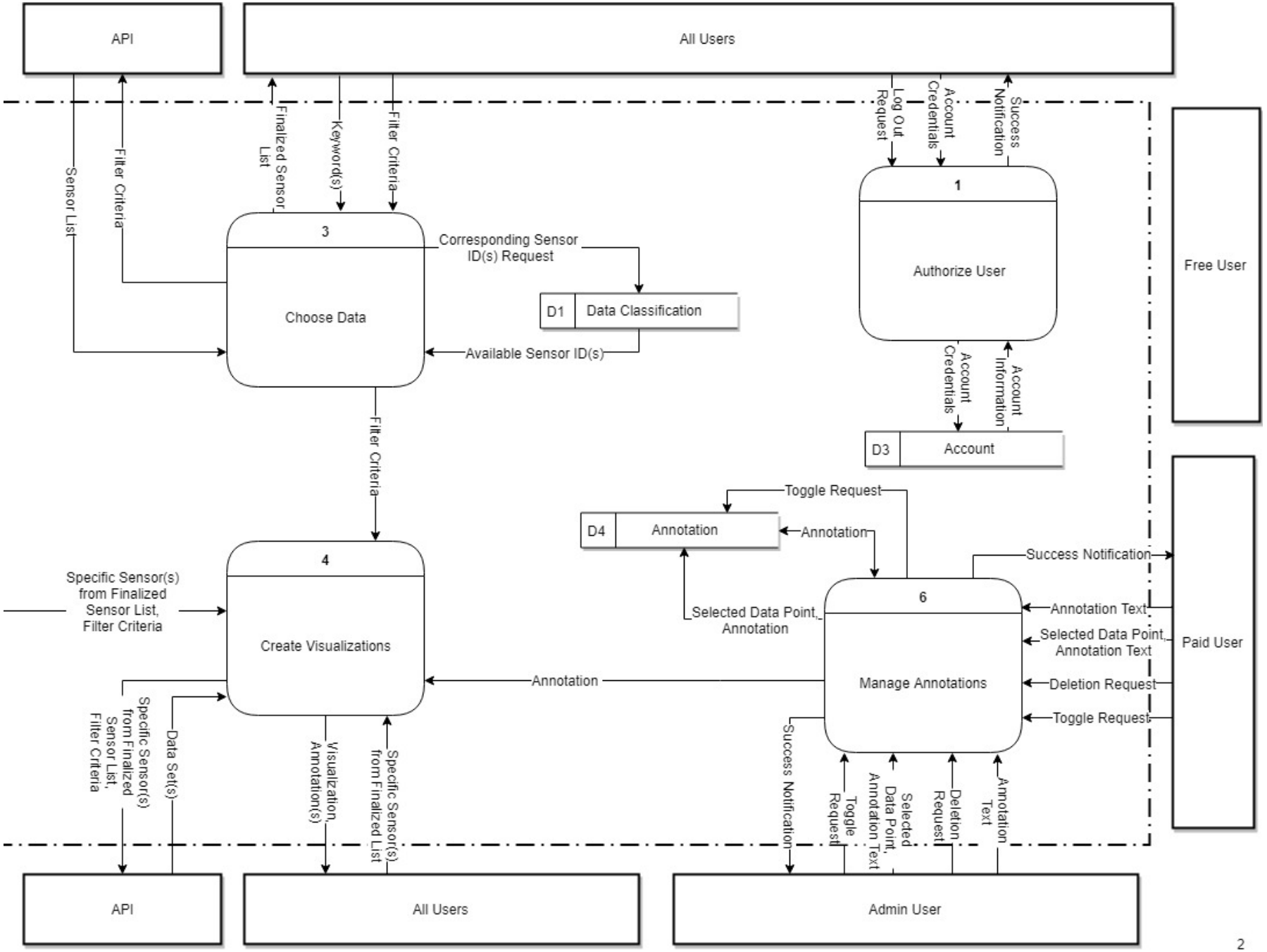


6.4 Data Flow Diagram Level 1

The diagram below shows the 7 processes that describe the DOD in more detail. The DOD system boundary is represented by the dotted line. External entities and actors are shown outside of the dotted line. Processes and the DOD's database are shown within the dotted line. Each datastore (labelled D#) represent a table in the DOD's database. Please view Appendix C – Data Flow Diagram Assembly for assembly instructions.

Data Flow Diagram Level 1

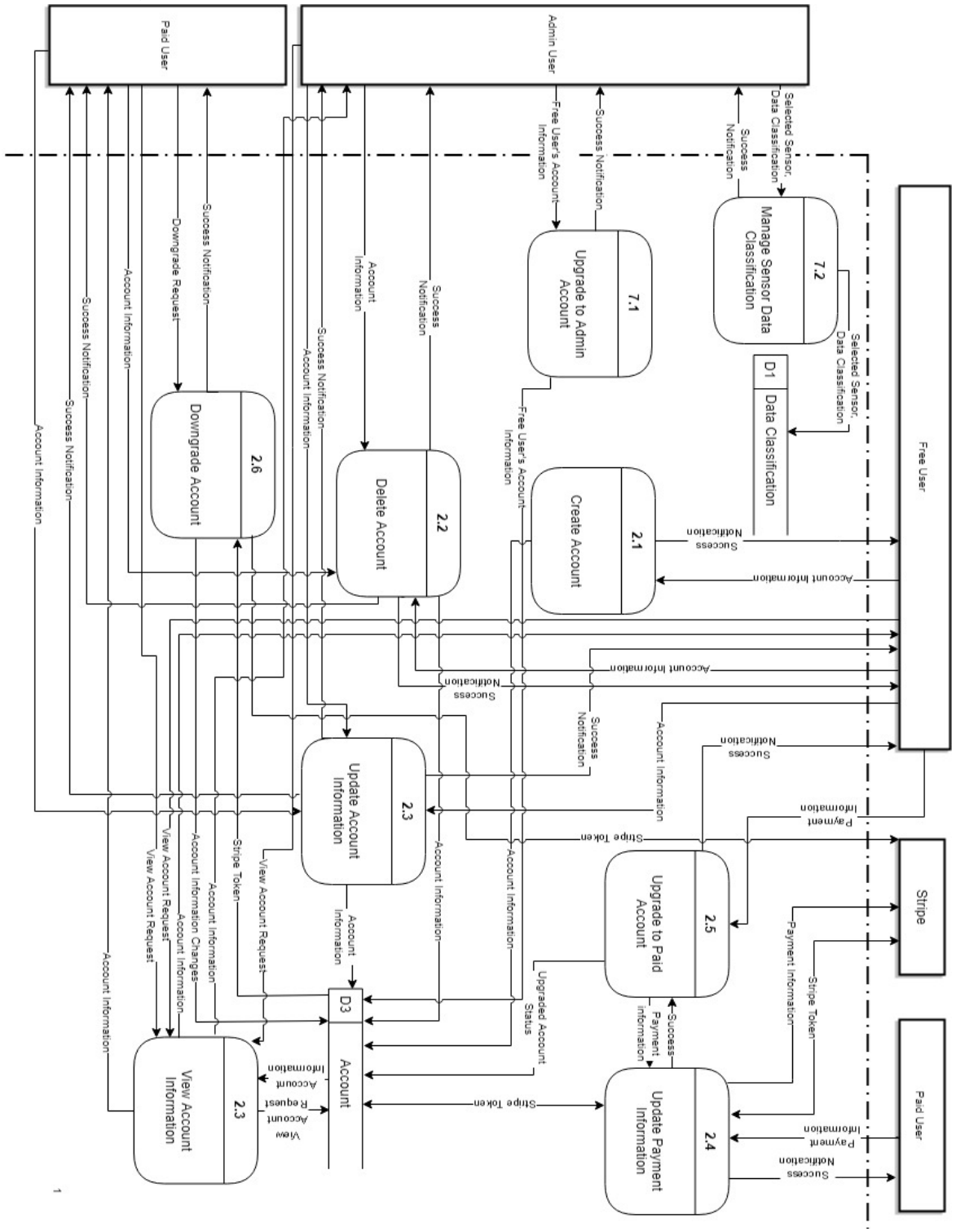


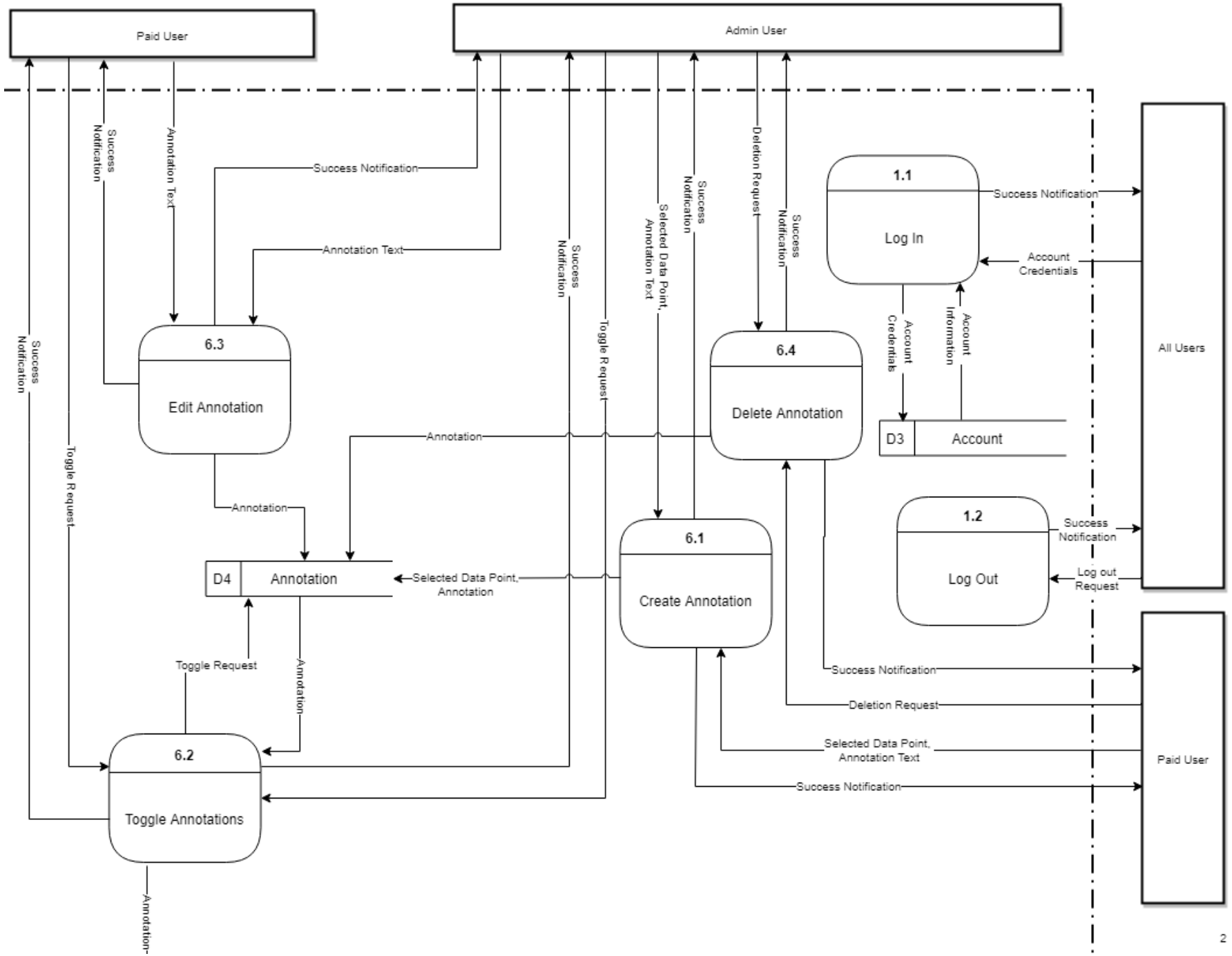

API
All Users
Free User
Paid User
Admin User
1
Authorize User
3
Choose Data
4
Create Visualizations
6
Manage Annotations
D1 Data Classification
D3 Account
D4 Annotation
Sensor List
Filter Criteria
Finalized Sensor List
Keyword(s)
Filter Criteria
Log Out Request
Account Credentials
Success Notification
Corresponding Sensor ID(s) Request
Available Sensor ID(s)
Account Credentials
Account Information
Filter Criteria
Toggle Request
Annotation
Success Notification
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
Selected Data Point, Annotation
Annotation Text
Selected Data Point, Annotation Text
Deletion Request
Toggle Request
Annotation
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
Data Set(s)
Visualization Annotation(s)
Specific Sensor(s) from Finalized List
Success Notification
Toggle Request
Selected Data Point, Annotation Text
Deletion Request
Annotation Text

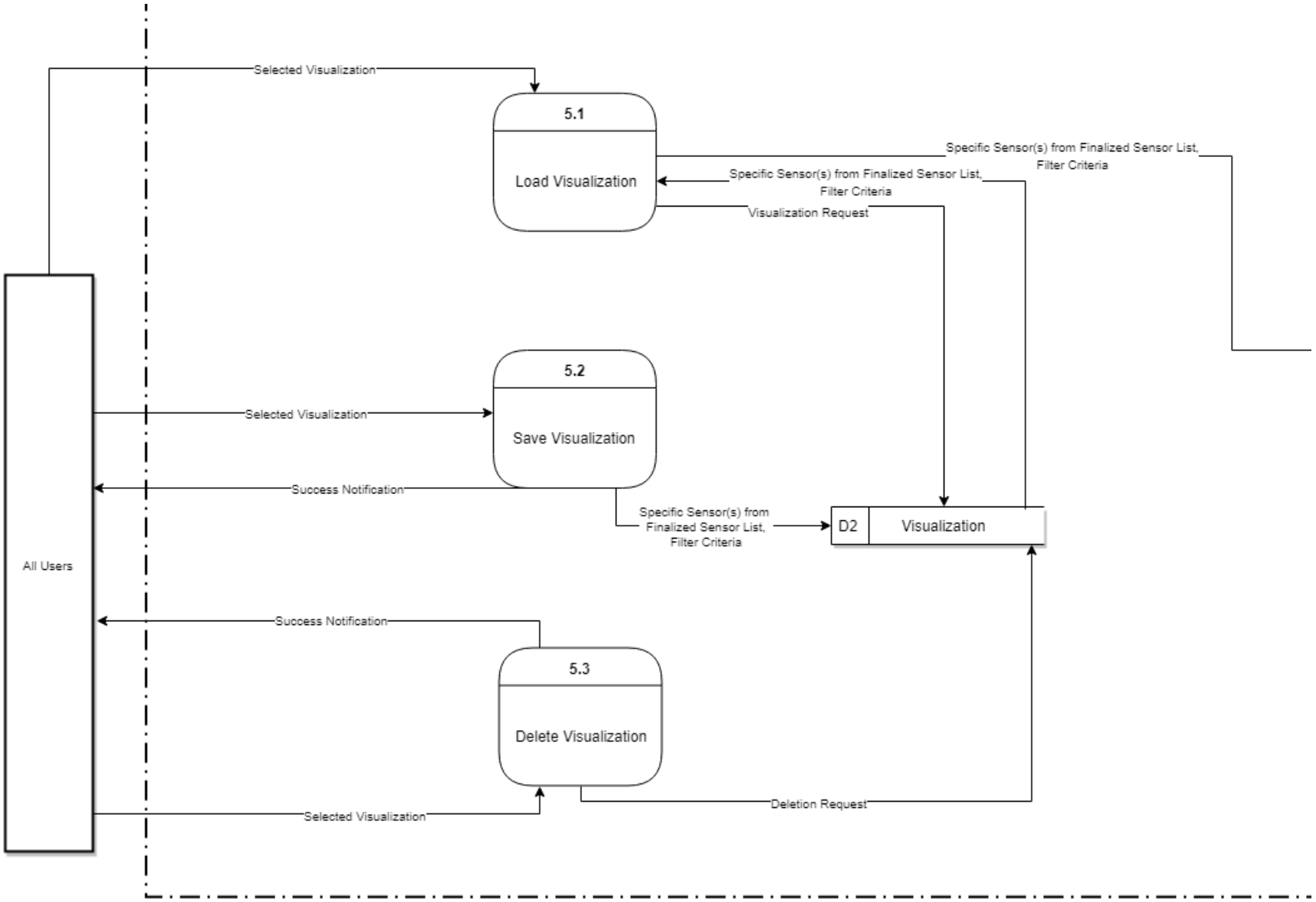
6.5 Data Flow Diagram Level 2

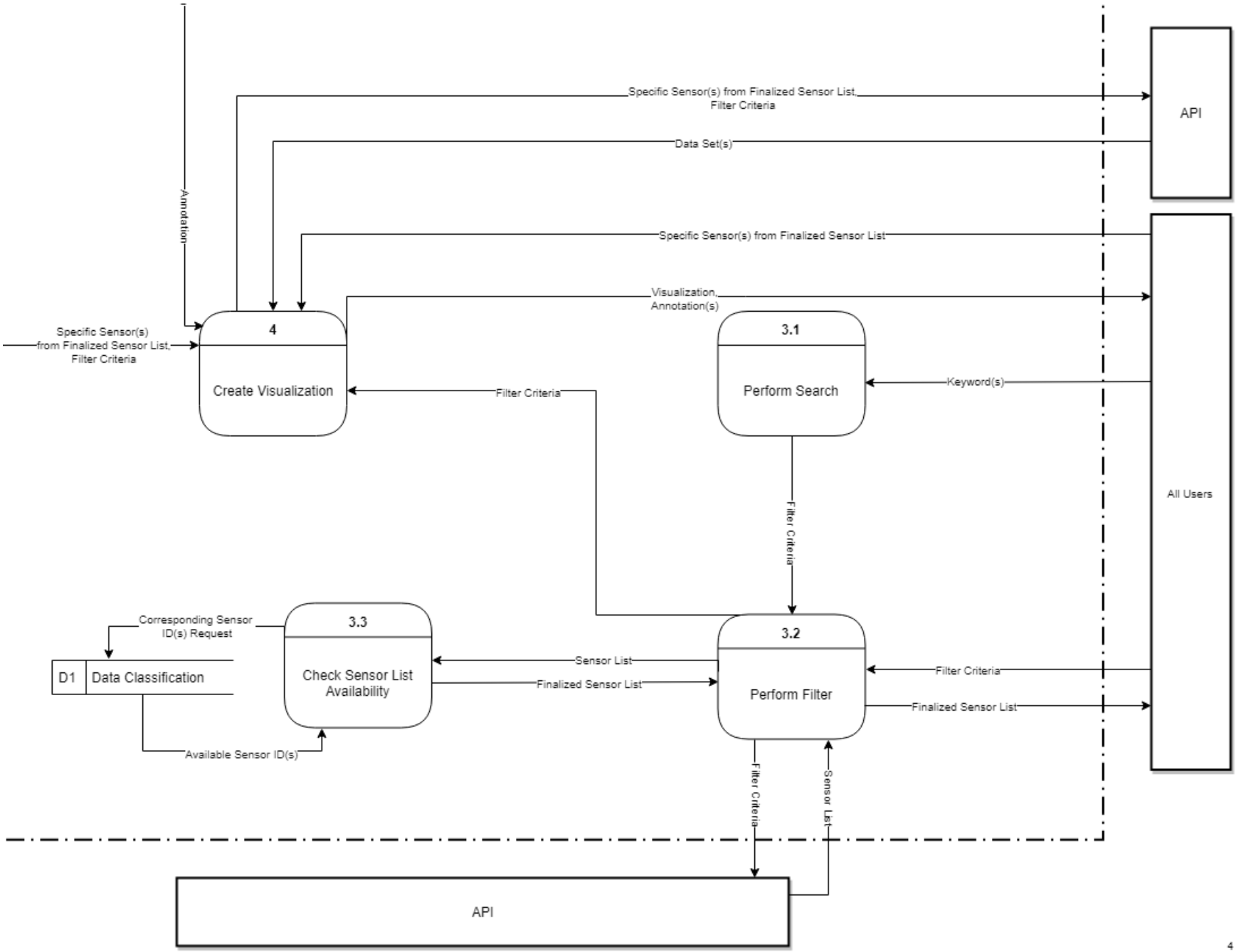
This diagram is a more detailed version of the one seen in section 6.4. The DOD system boundary is represented by the dotted line. External entities and actors are shown outside of the dotted line. Processes and the DOD's database are shown within the dotted line. Each datastore (labelled D#) represent a table in the DOD's database. The diagram breaks down the processes from the diagram seen in 6.4 into specific processes. It shows all the data flow between actors and these specific processes. Please view Appendix C – Data Flow Diagram Assembly for assembly instructions.

Data Flow Diagram Level 2




Paid User
Admin User
All Users
Paid User
1.1
Log In
1.2
Log Out
6.1
Create Annotation
6.2
Toggle Annotations
6.3
Edit Annotation
6.4
Delete Annotation
D3
Account
D4
Annotation
Success Notification
Annotation Text
Toggle Request
Selected Data Point, Annotation Text
Deletion Request
Account Credentials
Account Information
Log out Request
Annotation


Selected Visualization
5.1
Load Visualization
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
Visualization Request
5.2
Save Visualization
Selected Visualization
Success Notification
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
D2
Visualization
All Users
Success Notification
5.3
Delete Visualization
Deletion Request
Selected Visualization

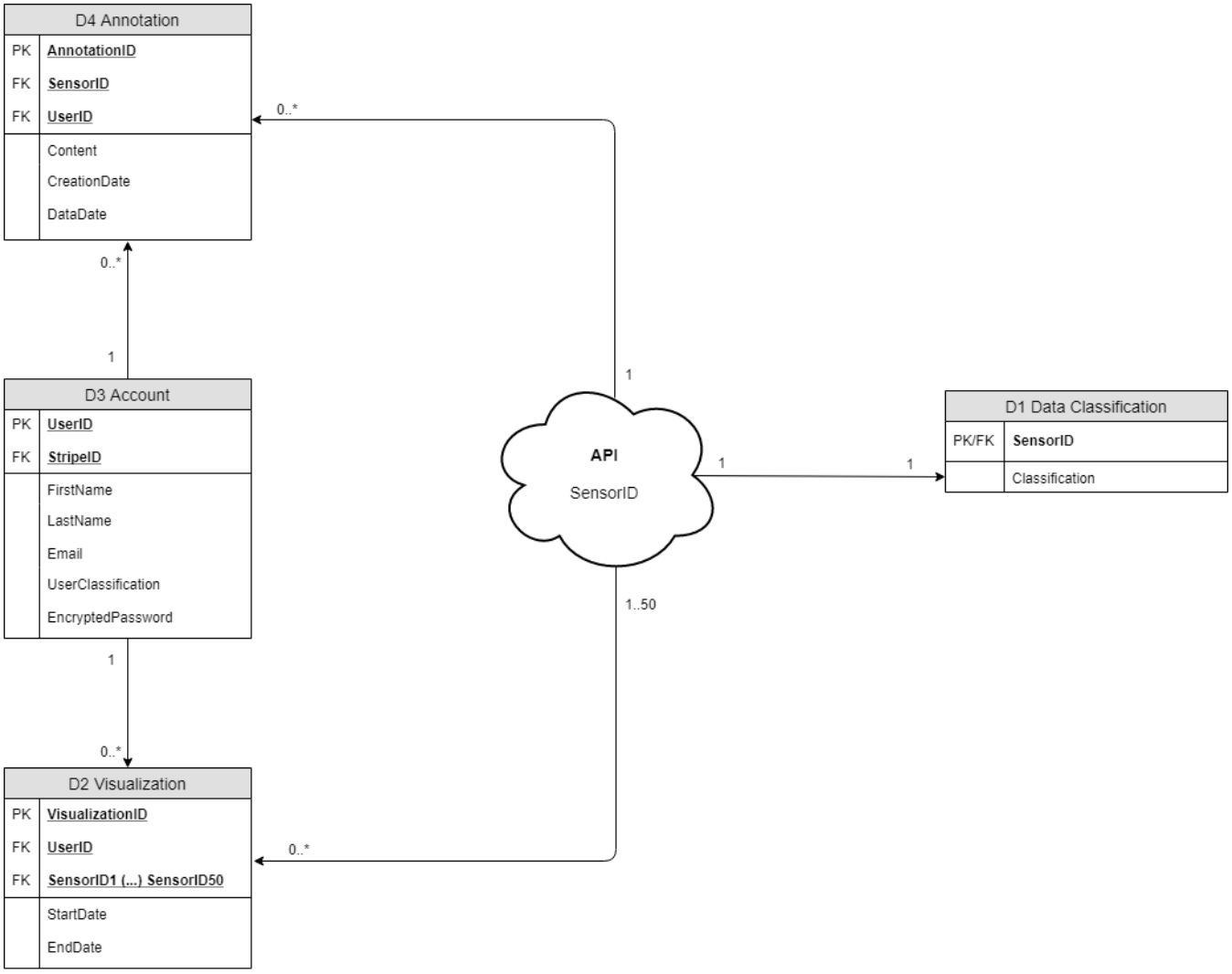

API
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
Data Set(s)
Annotation
Specific Sensor(s) from Finalized Sensor List
Visualization, Annotation(s)
All Users
Specific Sensor(s) from Finalized Sensor List, Filter Criteria
4
Create Visualization
3.1
Perform Search
Keyword(s)
Filter Criteria
Filter Criteria
Corresponding Sensor ID(s) Request
D1
Data Classification
3.3
Check Sensor List Availability
Sensor List
Finalized Sensor List
3.2
Perform Filter
Filter Criteria
Finalized Sensor List
Available Sensor ID(s)
Filter Criteria
Sensor List
API
4

6.6 Entity Relationship Diagram

This entity-relationship diagram shows the four data entities within the DOD and their relationships with each other. The four entities are data classification, visualization, account and annotation. Within each entity are its attributes, such as UserID for the D3 Account entity.

The diagram follows standard modelling notation with the following modifications: The cloud-shaped entity represents Daintree's API, from which the DOD accesses sensor data for the purpose of generating visualizations. The direction of the arrows represents the flow of primary keys within the system, each destination entity contains the source entity's primary key as a foreign key.

Entity Relationship Diagram



The following tables outline the attributes within each entity. For each attribute the table shows its name, data type, data format, size, and a short description.

D1 - Data Classification

Field Name	Data Type	Data Format	Field Size	Description
SensorID	Integer	NNNNNNNN	8	Unique number ID that identifies each sensor in Daintree's database.
Classification	String		5	Identifies which user types are able to include each sensor in a visualization. Must be one of: "All users" or "Paid/Admin users Only".

D2 - Visualization

Field Name	Data Type	Data Format	Field Size	Description
VisualizationID	Integer	NNNNNNNN	8	Unique number ID for each Visualization.
UserID	Integer	NNNNNNNN	8	Unique number ID for each user.
SensorID1 (...) SensorID50	Integer	NNNNNNNN	8	Unique number ID that identifies each sensor in Daintree's database. Each Visualization contains at least one and at most fifty sensor IDs. Unused fields are left blank.
StartDate	DateTime	YYYY/MM/DD HH:MM:SS	20	Timestamp containing the start date & time of sensor data that will be used to generate the visualization.
EndDate	DateTime	YYYY/MM/DD HH:MM:SS	20	Timestamp containing the end date & time of sensor data that will be used to generate the visualization.

D3 - Account

Field Name	Data Type	Data Format	Field Size	Description
UserID	Integer	NNNNNNNN	8	Unique number ID for each user.
StripeID	String		14	Unique text ID that identifies each user's payment information.
FirstName	Varchar		30	The user's first name.
LastName	Varchar		30	The user's last name.
Email	Varchar		30	The user's email address.
UserClassification	String		5	The user's account type. Must be one of: "Free", "Paid", "Admin".
EncryptedPassword	String		30	The user's password for account credentials.

D4 - Annotation

Field Name	Data Type	Data Format	Field Size	Description
AnnotationID	Integer	NNNNNNNN	8	Unique number ID for each annotation.
SensorID	Integer	NNNNNNNN	8	Unique number ID that identifies each sensor in Daintree's database.
UserID	Integer	NNNNNNNN	8	Unique number ID for each user.
Content	Varchar		500	The text content of the annotation.
CreationDate	DateTime	YYYY/MM/DD HH:MM:SS	20	Timestamp containing the annotation's creation date & time.
DataDate	DateTime	YYYY/MM/DD HH:MM:SS	20	Timestamp referencing the specific data point in the sensor's data set to which the annotation is attached.

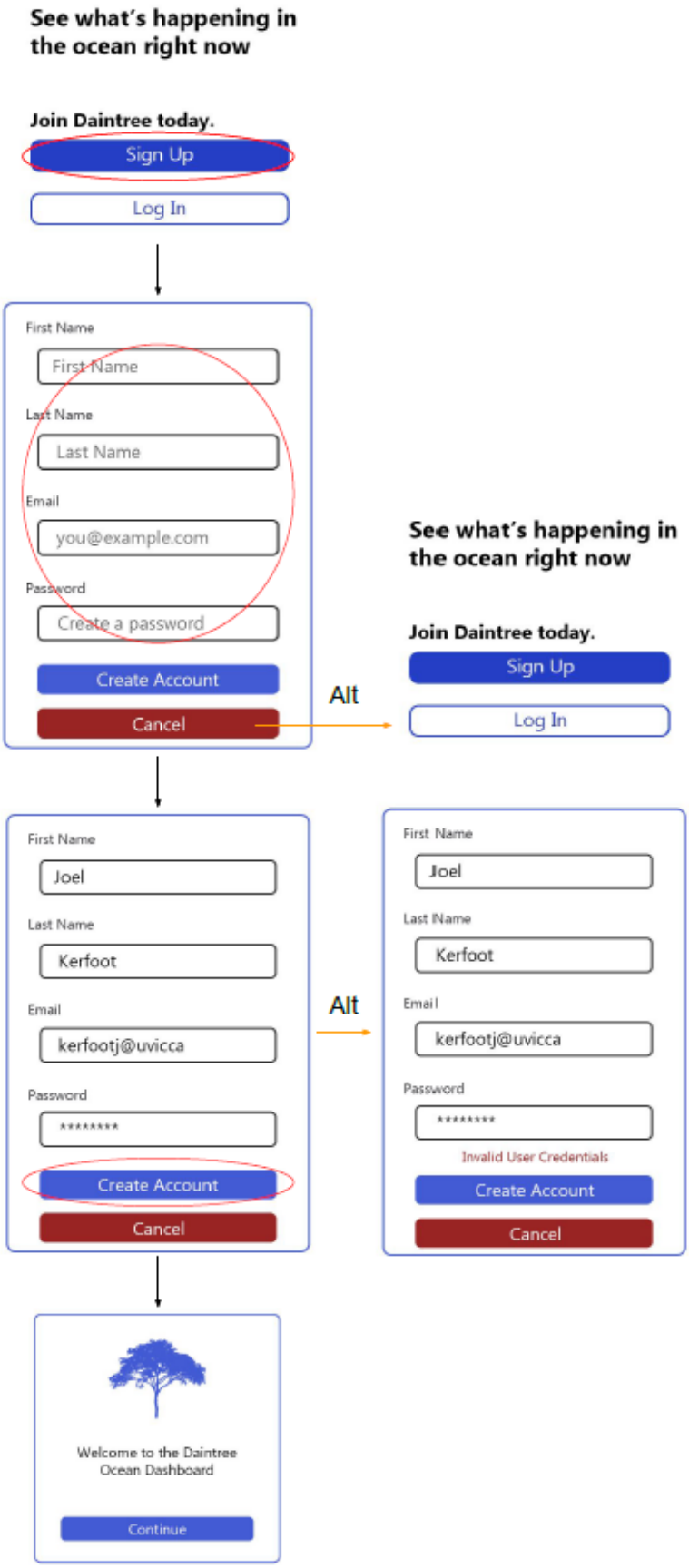
7 Solution

7.1 Account Management

This section provides an example of how the Account Management features described in section 3.1 could be implemented in the DOD. To view digital versions of the UI mock-ups please visit https://drive.google.com/open?id=1MuJkzAaMRaqf9cHlYTqu3dCbGvWMfawT. To view an interactive interface please visit https://invis.io/ERQZZ8I4YM5#/352038064_Landing.

7.1.1 Create Account

UI Mock-Up – Create Account



Scenario 1 – Create Account

A new user has navigated to the account creation page from the DOD landing page. The user enters their account information. The user submits their account information. The DOD then creates a new account that has Free User status and notifies the user that their account has been created. The DOD then logs the user into the new account.

Scenario 1a – User Cancels Account Creation

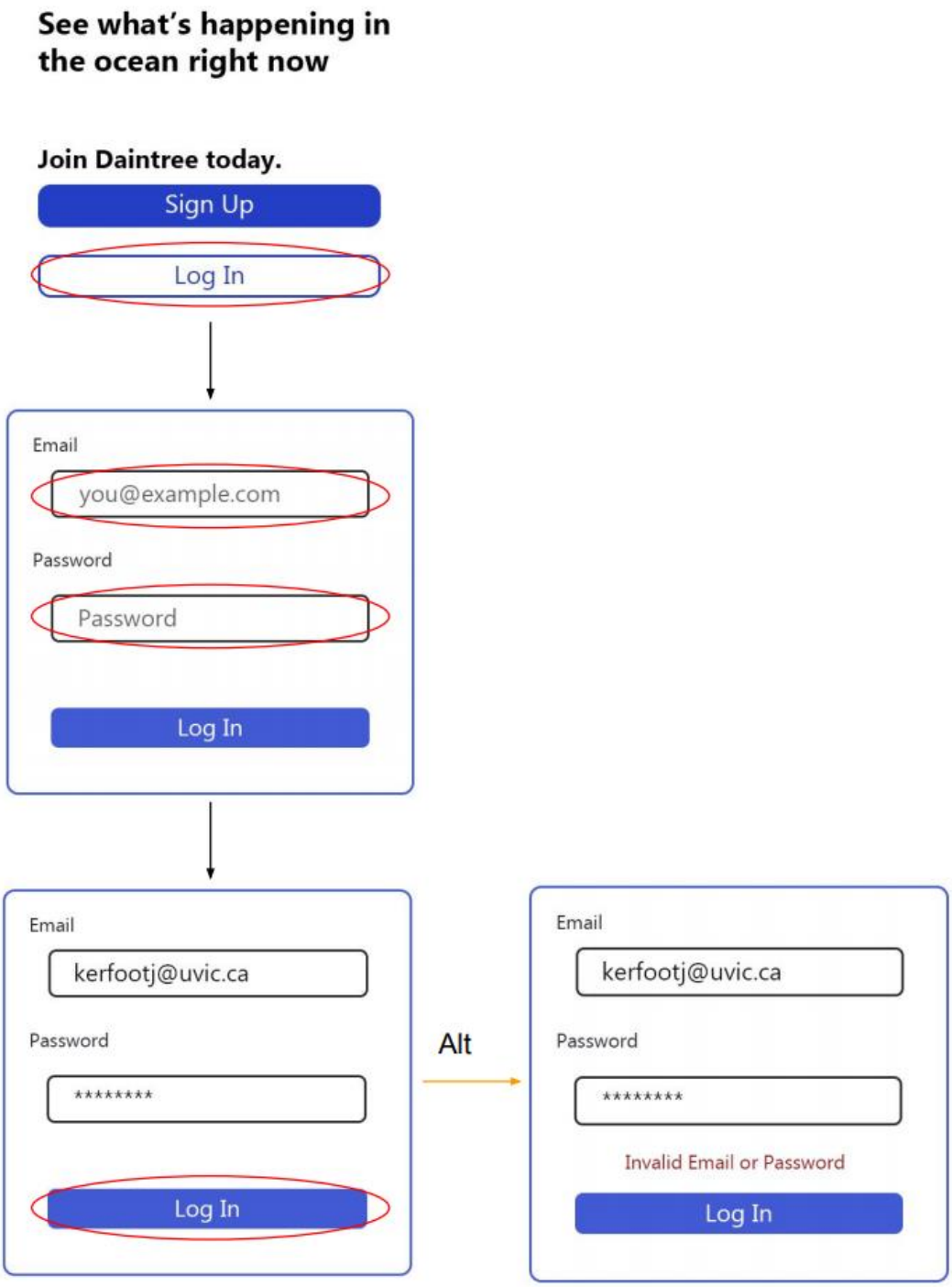
A new user has navigated to the account creation page from the DOD landing page. The user enters their account information. The user cancels the account creation process without submitting their account information. The DOD returns the user to the landing page and no new account is created.

Scenario 1b – Invalid Account Information

A new user has navigated to the account creation page from the DOD landing page. The user then enters their account information. The user submits their account information. However, one or more pieces of account information do not match the required format. The DOD notifies the user that their account information is invalid.

7.1.2 Log In

UI Mock-Up 2 – Log In



Scenario 2 – Log In

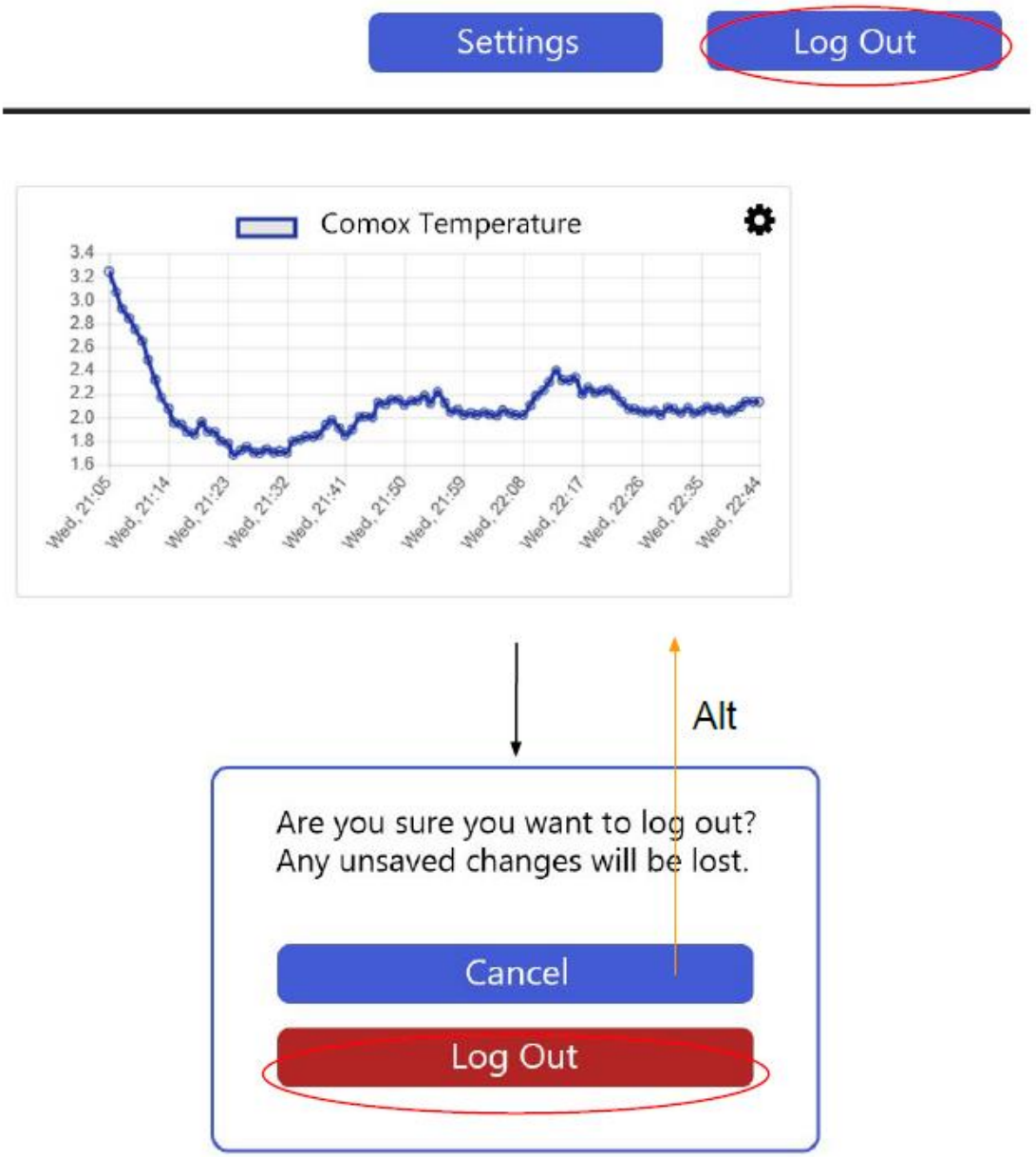
A Free User, Paid User or Admin User has navigated to the login page of the DOD. The user enters their account credentials and submits their account credentials. The DOD logs the user into their account.

Scenario 2a – Invalid Account Credentials

A Free User, Paid User or Admin User has navigated to the login page of the DOD. The user enters their account credentials and submits their account credentials. However, either the email address the user entered is not associated with an account, or the password is incorrect. The DOD notifies the user that their account credentials are invalid.

7.1.3 – Log Out

UI Mock-Up 3 – Log Out



Scenario 3 Log Out

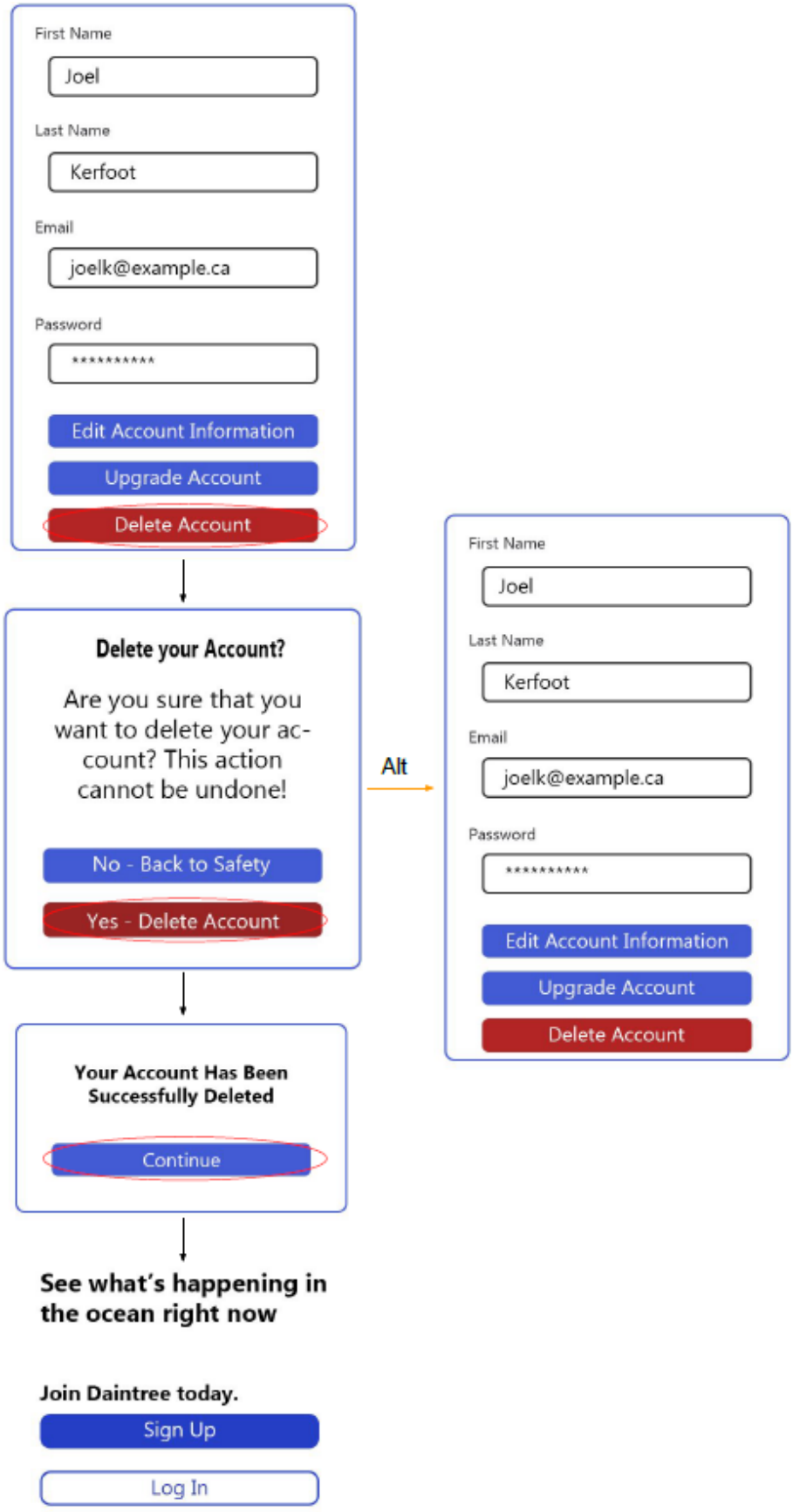
A Free User, Paid User or Admin User is logged into the DOD. The user selects log out. The user is prompted to confirm the log out. The user confirms the log out. The DOD logs the user out of their account and returns the user to the landing page.

Scenario 3a Cancel Log out

A Free User, Paid User, or Admin User is logged into the DOD. The user selects log out. The user is prompted to confirm the log out. The user cancels the log out. The DOD does not log the user out of their account and returns the user to the page they were on.

7.1.4 – Delete Account

UI Mock-Up 4 – Delete Account



Scenario 4 – User Deletes Their Account

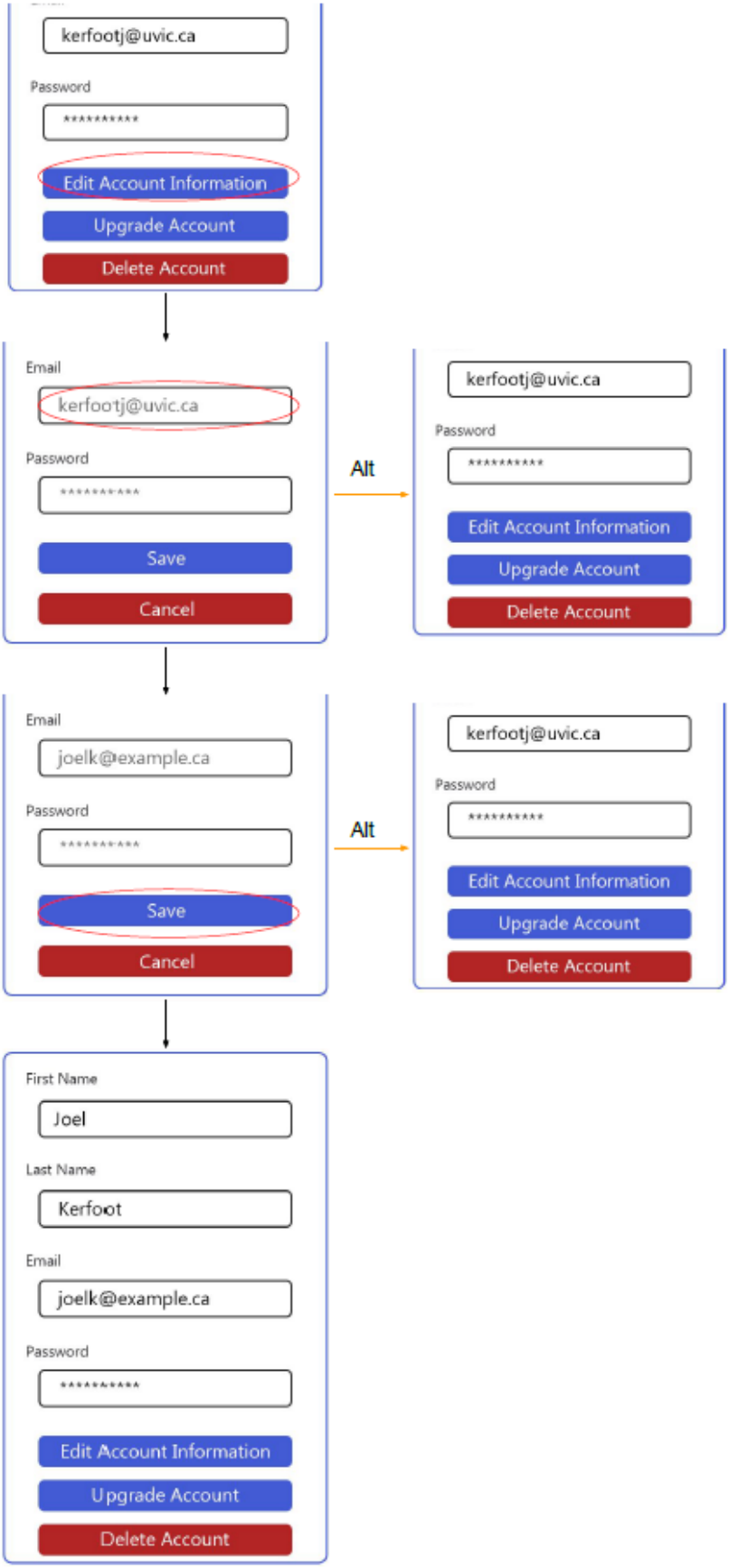
A Free User, Paid User or Admin User is logged into the DOD and has navigated to the account information page. The user selects delete account and confirms that they wish to delete their account. The DOD deletes the user's account, notifies the user that their account was deleted, and returns the user to the landing page.

Scenario 4a – User Cancels Account Deletion

A Free User, Paid User or Admin User is logged into the DOD and has navigated to the account information page. The user selects delete account but cancels the account deletion. The DOD does not delete the user's account.

7.1.5 – Update Account Information

UI Mock-Up 5 – Update Account Information



Scenario 5 – Update Account Information

A Free User, Paid User or Admin User is logged into the DOD and has navigated to the account information page. The user selects edit account information. The user enters changes to their account information and saves the changes. The system updates the user's account information and notifies the user that the update was successful.

Scenario 5a – User Cancels Account Information Update

A Free User, Paid User or Admin User is logged into the DOD and has navigated to the account information page. The user selects edit account information. The user cancels the account information update without saving changes. The DOD discards any account information changes that were entered by the user.

7.1.6 – Upgrade Account

UI Mock-Up 6 – Upgrade Account

Scenario 6 – Free User Upgrades Their Account to Paid User Account

A Free User is logged into the DOD and has navigated to the account information page. The user selects upgrade account and enters their payment information. The user submits their payment information. The DOD changes the user's account status to Paid User and notifies the user that the upgrade was successful.

Scenario 6a – User Cancels Account Upgrade

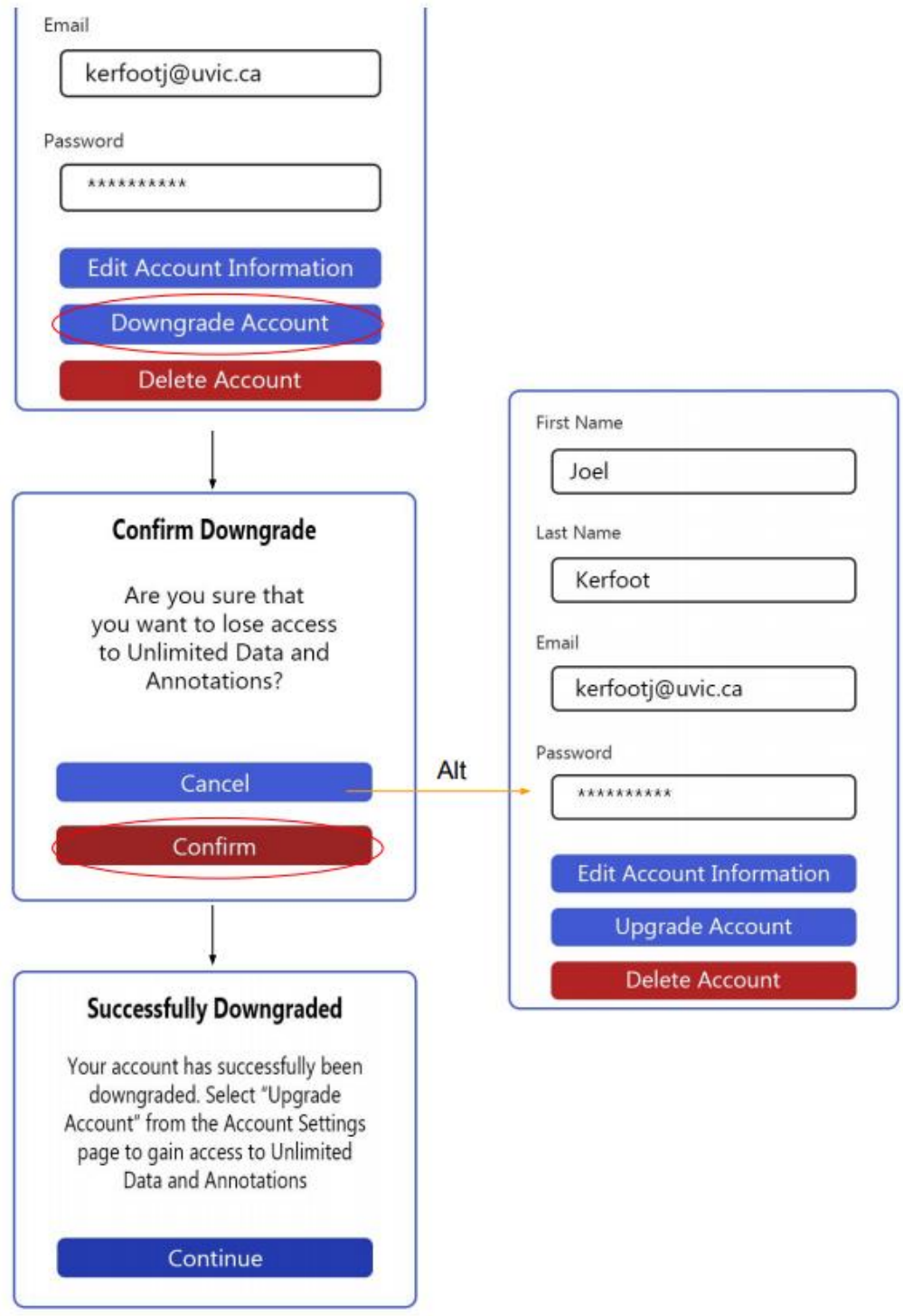
A Free User is logged into the DOD and has navigated to the account information page. The user selects upgrade account but cancels the process before submitting their payment information. The DOD does not upgrade the user's account status to Paid User.

Scenario 6b – Invalid Payment Information

A Free User is logged into the DOD and has navigated to the account information page. The user selects upgrade account and enters their payment information. The user submits their payment information. However, the payment information is invalid. The system notifies the user that the payment information they entered is invalid.

7.1.7 – Downgrade Account

UI Mock-Up 7 – Downgrade Account



Scenario 7 – Paid User Downgrades Their Account to Free User Account

A Paid User is logged into the DOD and has navigated to the account information page. The user selects downgrade account and confirms that they wish to downgrade their account status. The DOD downgrades the user's account status to Free User and notifies the user that the downgrade was successful.

Scenario 7a – User Cancels Account Downgrade

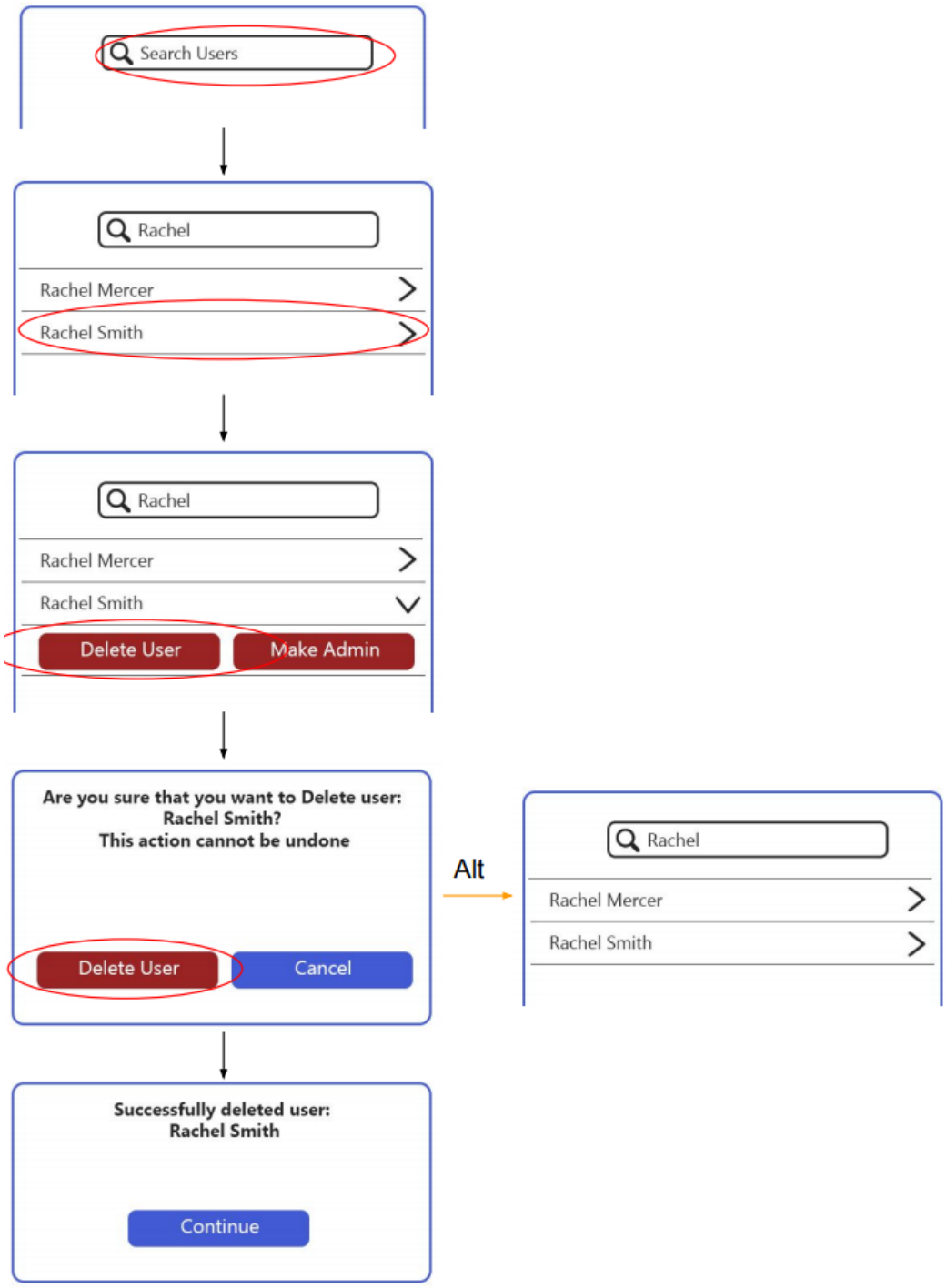
A Paid User is logged into the DOD and has navigated to the account information page. The user selects downgrade account but cancels the downgrade process. The DOD does not downgrade the user's account status to Free User.

7.2 Administration

This section provides an example of how the Administration features described in section 3.2 could be implemented in the DOD.

7.2.1 Admin Deletes a User Account

UI Mock-Up 8 – Admin Deletes a User Account



Scenario 8 – Admin User Deletes another User's Account

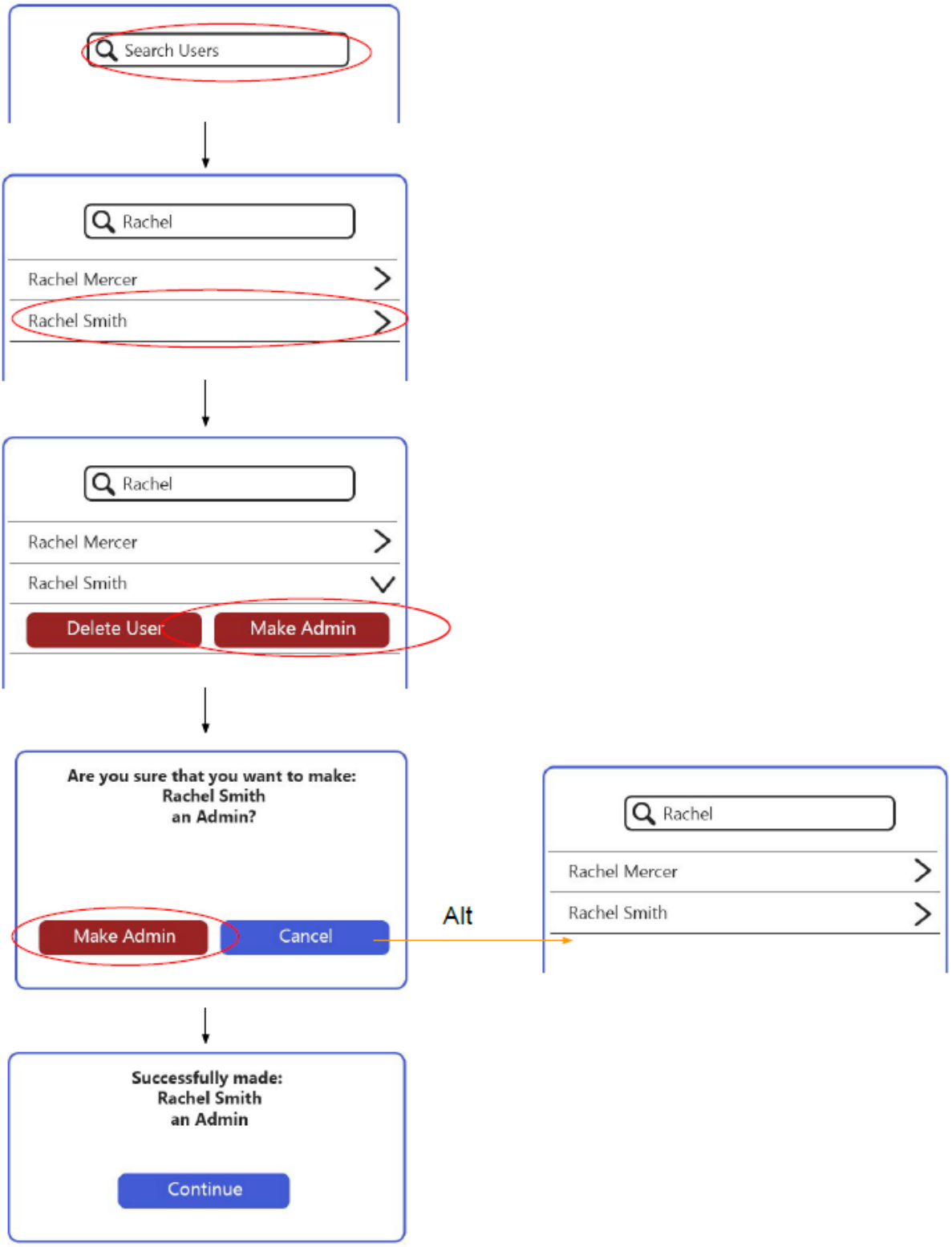
An Admin User is logged into the DOD and has navigated to the admin page. The Admin User enters another Free, Paid or Admin User's account information and selects the desired account. The Admin User selects delete account and confirms that they wish to delete the account. The DOD deletes the account and notifies the Admin User that the account deletion was successful.

Scenario 8a – Admin User Cancels Account Deletion

An Admin User is logged into the DOD and has navigated to the admin page. The Admin User enters another Free, Paid or Admin User's account information and selects the desired account. The Admin User selects delete account. However, the Admin User cancels the account deletion. The DOD does not delete the account.

7.2.2 Admin Upgrades another User to Admin

UI Mock-Up 9 – Admin Grants Admin to another User



Scenario 9 – Admin User Upgrades another User Account to Admin User Account

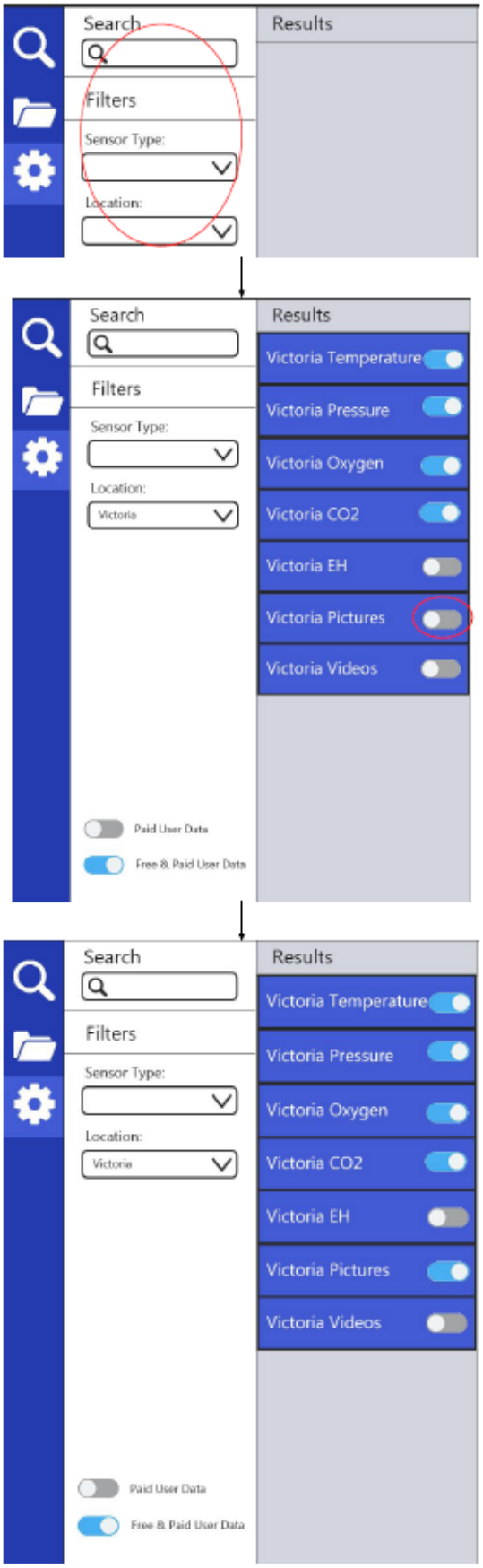
An Admin User is logged into the DOD and has navigated to the admin page. The Admin User enters another Free User's account information and selects the desired account. The Admin User selects make admin and confirms the account upgrade. The DOD upgrades the selected account to Admin User status and notifies the Admin User who requested the change that the upgrade was successful.

Scenario 9a – Admin User Cancels Account Upgrade

An Admin User is logged into the DOD and has navigated to the admin page. The Admin User enters another Free User's account information and selects the desired account. The Admin User selects make admin. However, the Admin User cancels the account upgrade. The DOD does not upgrade the selected account to Admin User status.

7.2.3 Manage Sensor Data Classification

UI Mock-Up 10 – Manage Sensor Data Classification



Scenario 10 – Manage Sensor Data Classification

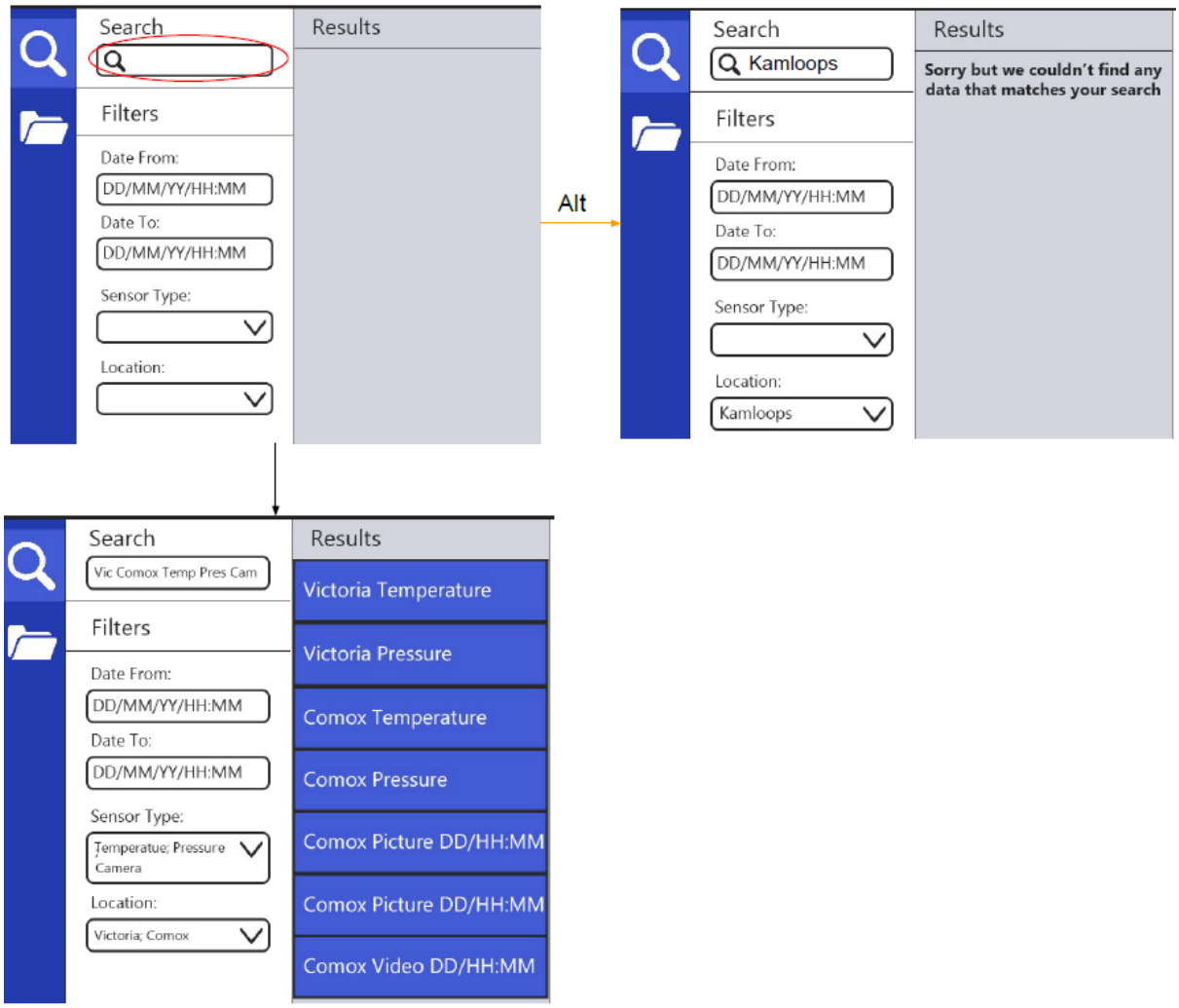
An Admin User is logged into the DOD and has navigated to the admin page. The user selects 0 or more locations and 0 or more sensor types. The user submits their filter criteria. The DOD displays a filtered list of sensors. The user toggles the data classification for a selected sensor between available to all users and available to only Paid Users and Admin Users. The DOD updates the data classification.

7.3 Visualization

This section provides an example of how the visualization features described in section 3.3 could be implemented in the DOD.

7.3.1 Search Data Sets

UI Mock-Up 11 – Search Data Sets



Scenario 11 – Search Data Sets

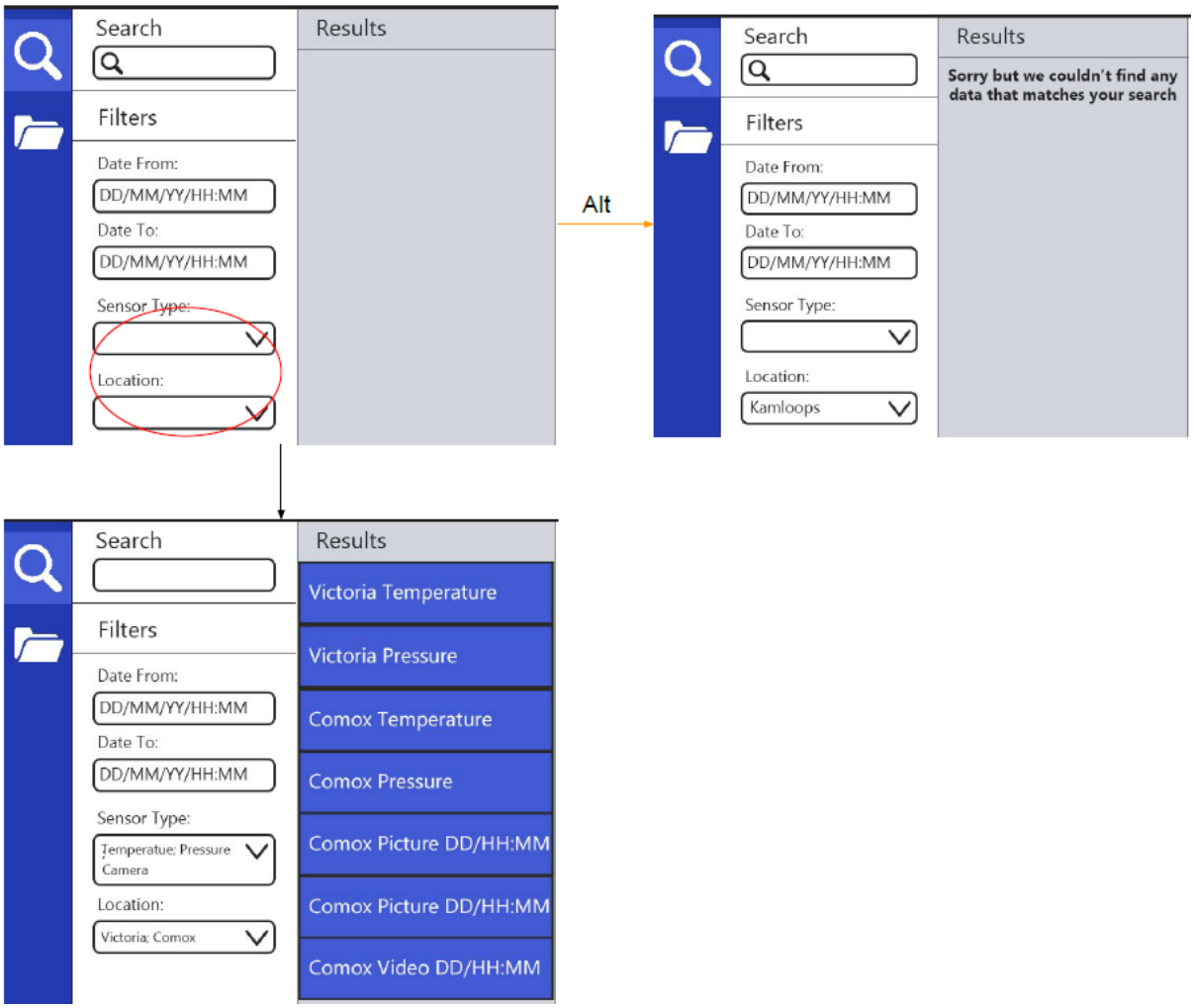
A Free User, Paid User or Admin User is logged into the DOD and has navigated to the dashboard page. The user enters a search query of one or more keywords and submits the search query. The DOD updates the filter criteria to match the keyword(s) in the user's search query. The DOD displays a list of one or more sensors with location(s), sensor type(s), and time range that match the filter criteria.

Scenario 11a – Search Query Matched No Data Sets

A Free User, Paid User or Admin User is logged into the DOD and has navigated to the dashboard page. The user enters a search query of one or more keywords and submits the search query. The DOD updates the filter criteria to match the keyword(s) in the user's search query. However, none of the sensors available to the user have data set(s) that match the filter criteria. The DOD notifies the user that no data set(s) matched their search query.

7.3.2 Filter Data Sets

UI Mock-Up 12 – Filter Data Sets



Scenario 12 – Filter Data Sets

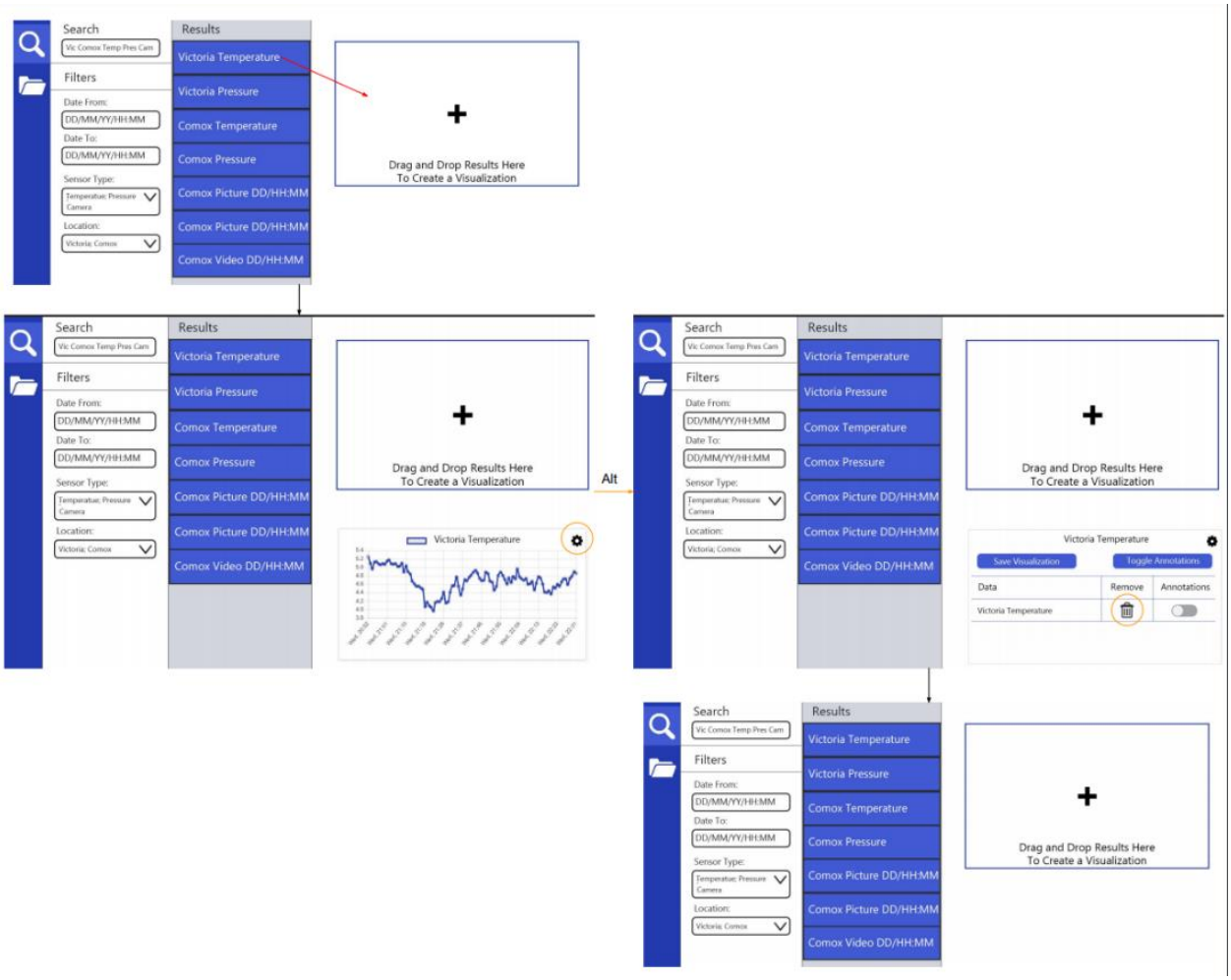
A Free User, Paid User or Admin User is logged into the DOD and has navigated to the dashboard page. The user selects zero or more locations, zero or more sensor types, and enters a start date and end date for which to filter data. The user submits the filter criteria. The DOD displays a list of one or more sensors with location(s), sensor type(s) and time range that match the filter criteria.

Scenario 12a – Filter Criteria Matched No Data Sets

A Free User, Paid User or Admin User is logged into the DOD and has navigated to the dashboard page. The user selects zero or more locations, zero or more sensor types, and enters a start date and end date for which to find data. The user submits the filter criteria. However, none of the sensors available to the user have data set(s) that match the filter criteria. The DOD notifies the user that no data set(s) matched their filter criteria.

7.3.3 Create Visualization

UI Mock-Up 13 – Create Visualization



Scenario 13 – Create Visualization

A Free User, Paid User or Admin User is logged into the DOD and has successfully searched or filtered the list of sensors. The user selects at least one and at most fifty sensors from the filtered list of sensors. The DOD displays a visualization that includes the sensors that were selected by the user.

Scenario 13a – Photo or Video Sensor Selected

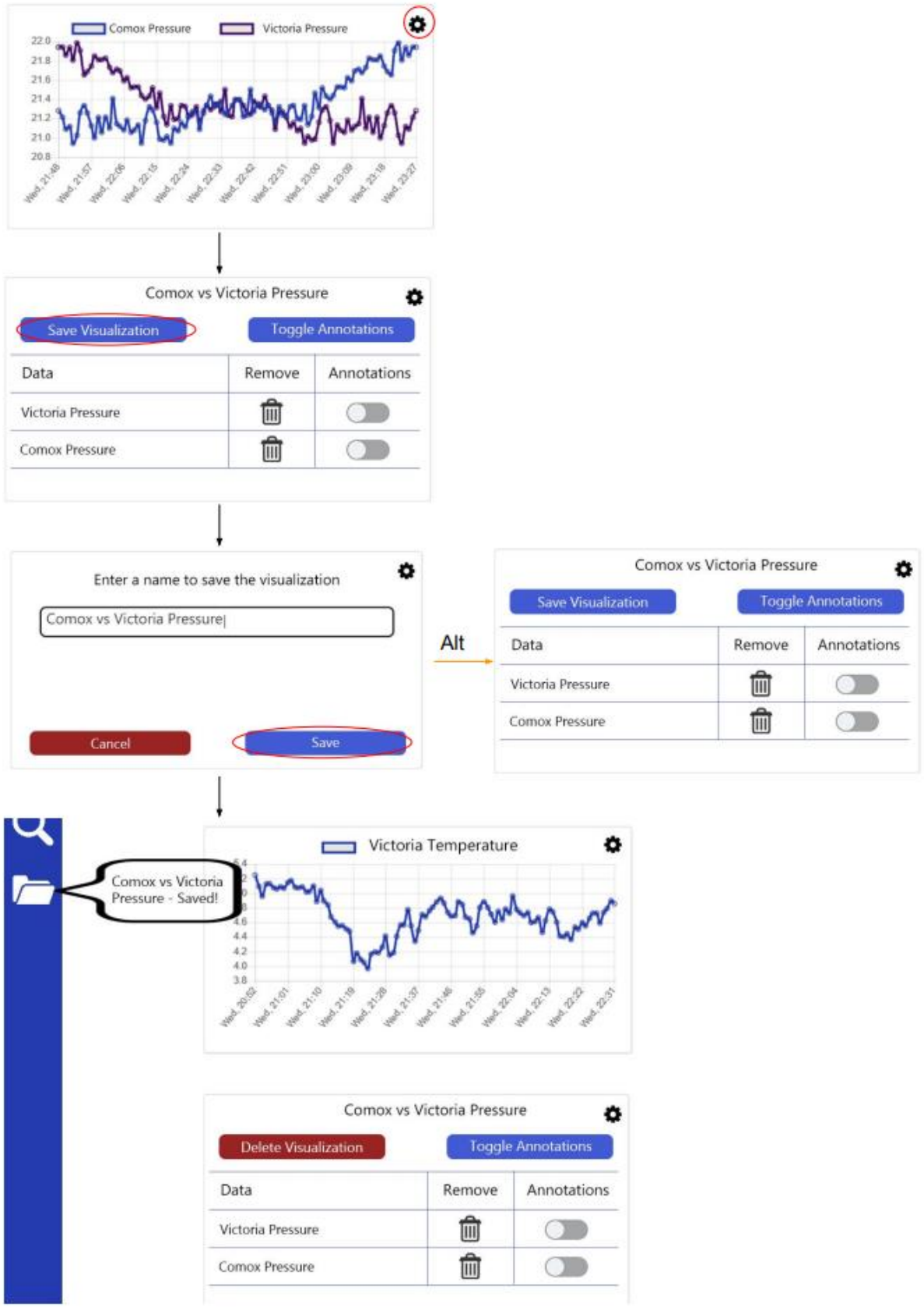
A Free User, Paid User or Admin User is logged into the DOD and has successfully searched or filtered the list of sensors. The user selects exactly one photo or video sensor from the filtered list of sensors. The DOD displays a visualization that includes the sensor that was selected by the user.

Scenario 13b – Remove Sensor from Visualization

A Free User, Paid User or Admin User is logged into the DOD and has successfully searched or filtered the list of sensors. The user removes a sensor from the visualization. The DOD updates the visualization to reflect the change.

7.3.4 Save Visualization

UI Mock-Up 14 – Save Visualization



Scenario 14 – Save Visualization

A Free User, Paid User or Admin User is logged into the DOD and has created a visualization. The user expands the visualization options and selects save. The user optionally enters a custom name and confirms the save. The DOD saves the visualization along with the name the user entered or a default name if the user did not enter a custom name. The DOD notifies the user that the save was successful.

Scenario 14a – User Cancels Save

A Free User, Paid User or Admin User is logged into the DOD and has successfully created a visualization. The user expands the visualization options and selects save. However, the user cancels the save process. The DOD does not save the visualization.

7.3.5 Load Visualization

UI Mock-Up 15 – Load Visualization

Scenario 15 – Load Visualization

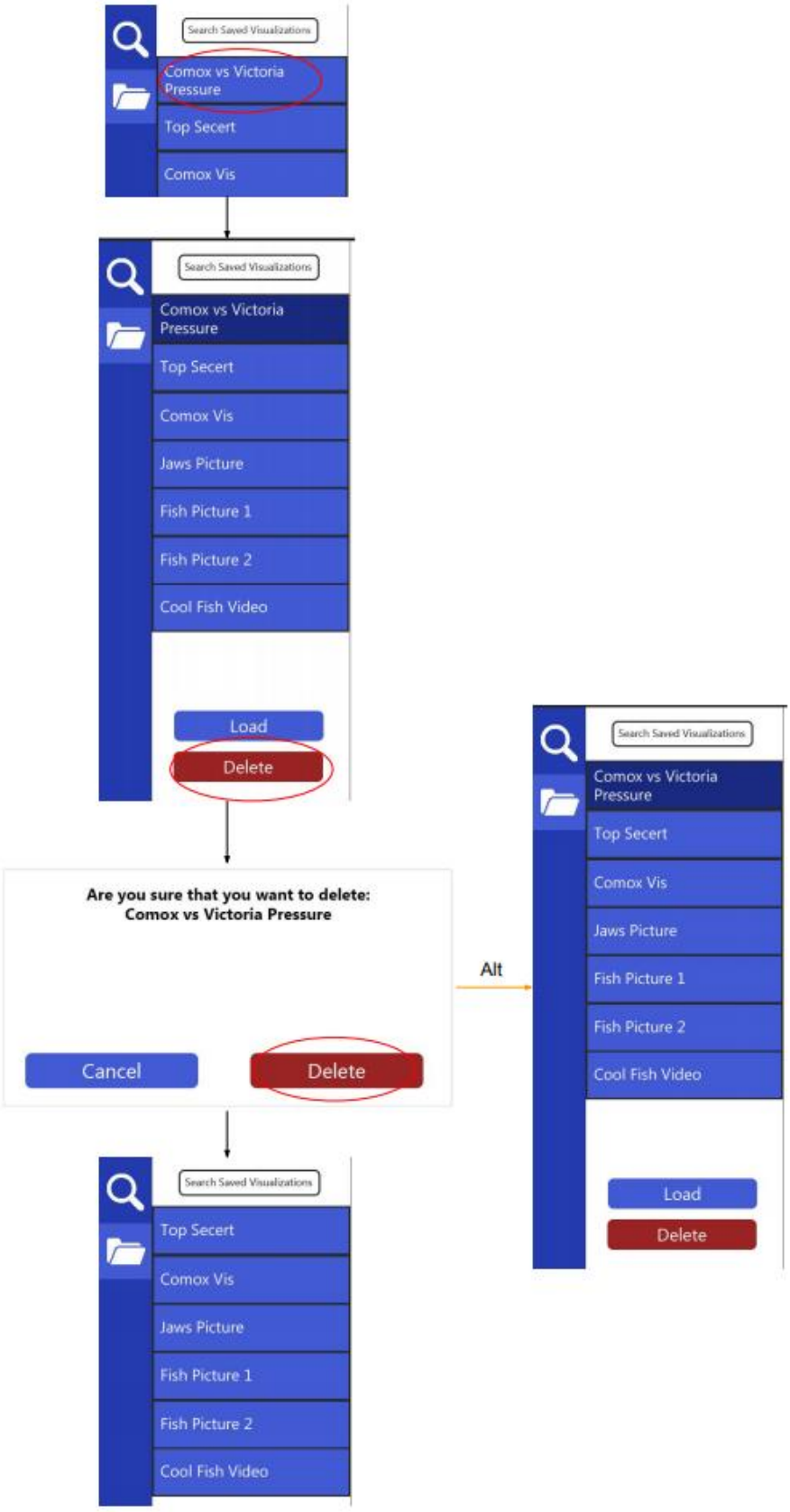
A Free User, Paid User or Admin User is logged into the DOD and has navigated to the dashboard page. The user opens the saved visualizations list. The user selects the visualization they wish to load. The DOD loads the selected visualization and displays it to the user.

Scenario 15a – Incorrect Data Permission

A Free User, Paid User or Admin User is logged into the DOD and has navigated to the dashboard page. The user opens the saved visualizations list. The user selects the visualization they wish to load. However, the visualization cannot be generated because the user's account status does not match the data classification for one or more of the sensors included in the visualization. The DOD notifies the user that they do not have permission to view the visualization.

7.3.6 Delete Saved Visualization

UI Mock-Up 16 – Delete Saved Visualization



Scenario 16 – Delete Saved Visualization

A Free User, Paid User, or Admin User is logged into the DOD and has navigated to the dashboard page. The user opens the saved visualizations list and selects a visualization. The user selects delete visualization and confirms the deletion. The DOD removes the selected visualization from the user's list of saved visualizations and informs the user that the deletion was successful.

Scenario 16a – User Cancels Visualization Deletion

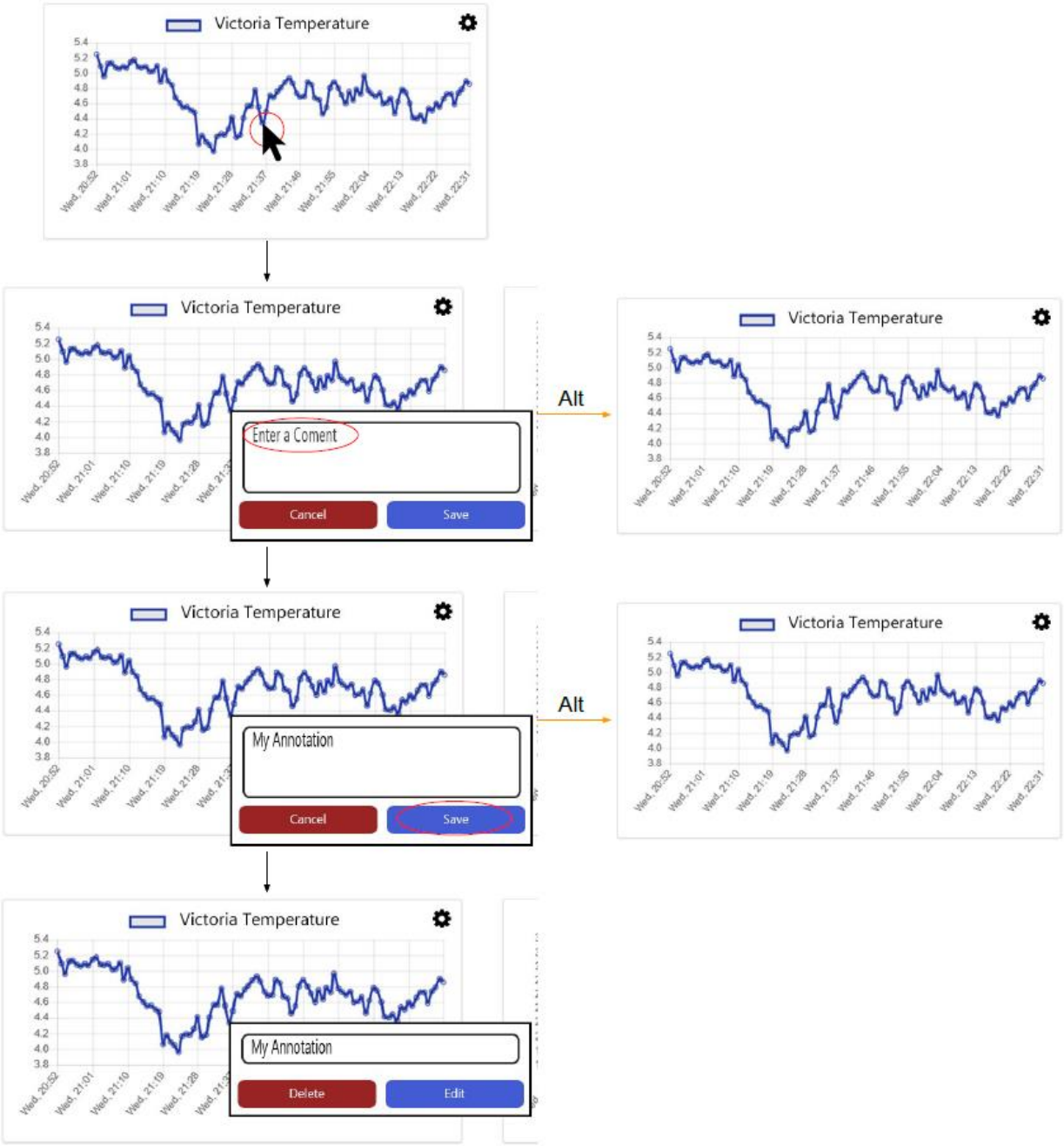
A Free User, Paid User, or Admin User is logged into the DOD and has navigated to the dashboard page. The user opens the saved visualization and selects a visualization. The user selects delete visualization but cancels the deletion. The DOD does not delete the selected visualization.

7.4 Annotation

This section provides an example of how the Annotation features described in section 3.4 could be implemented in the DOD.

7.4.1 Create Annotations

UI Mock-Up 17 – Create Annotations



Scenario 17 – Create Annotation

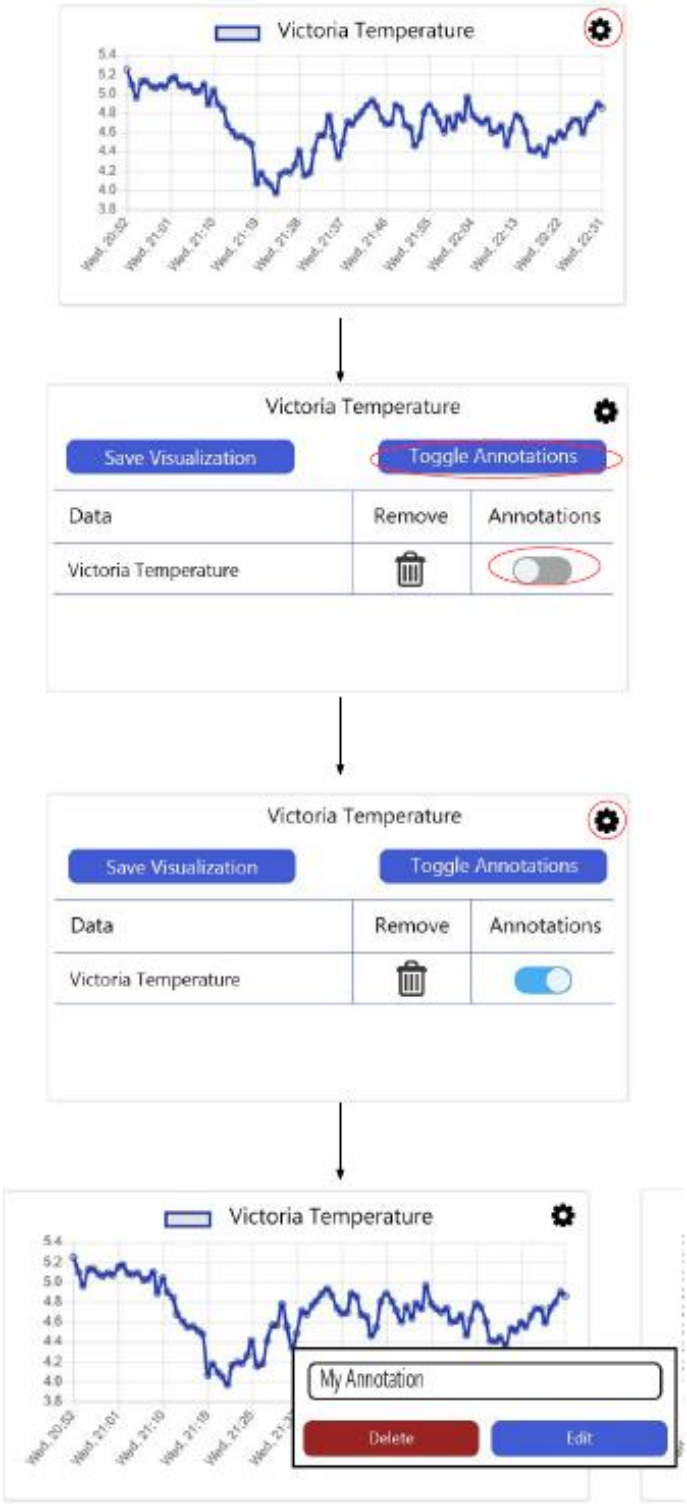
A Paid User or Admin User is logged into the DOD and has created or loaded a visualization. The user selects a data point on the visualization and enters the text content of their annotation. The user submits the annotation. The DOD saves the annotation and links it to the selected data point, and displays the new annotation.

Scenario 17a – User Cancels Annotation Creation

A Paid User or Admin User is logged into the DOD and has created or loaded a visualization. The user selects a data point on the visualization and enters the text content of their annotation. However, the user cancels the annotation process without submitting their annotation. The DOD does not create a new annotation.

7.4.2 Toggle Annotations

UI Mock-Up 18 – Toggle Annotation



Scenario 18 – Toggle Annotations On

A Paid User or Admin User is logged into the DOD and has created or loaded a visualization. The user selects toggle annotations on. The DOD updates the visualization to display any annotations linked to data points which are included in the visualization.

Scenario 18a – Toggle Annotations Off

A Paid User or Admin User is logged into the DOD and has created or loaded a visualization. The user selects toggle annotations off. The DOD updates the visualization to not display annotations.

7.4.3 Delete Annotation

UI Mock-Up 19 – Delete Annotation

Scenario 19 – Delete Annotation

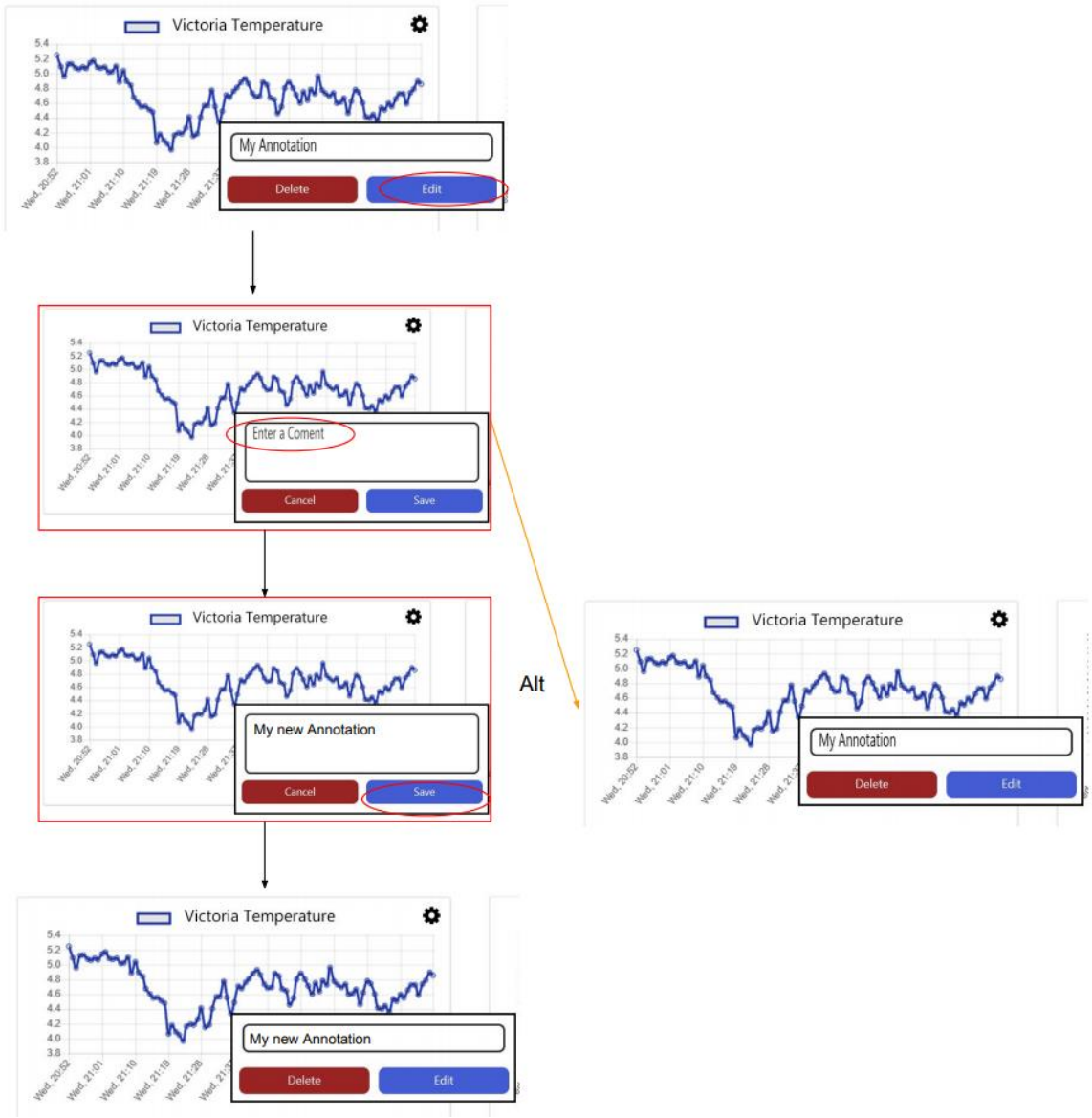
A Paid User or Admin User is logged into the DOD and has successfully toggled annotation on. The user selects an annotation. The user selects delete annotation and confirms the deletion. The DOD deletes the selected annotation and notifies the user that the deletion was successful.

Scenario 19a – User Cancels Annotation Deletion

A Paid User or Admin User is logged into the DOD and has successfully toggled annotations on. The user selects an annotation. The user selects delete annotation but cancels the deletion. The DOD does not delete the selected annotation.

7.4.4 Edit Annotation

UI Mock-Up 20 – Edit Annotation



Scenario 20 – Edit Annotation

A Paid User or Admin User is logged into the DOD and has successfully toggled annotations on. The user selects an annotation that the user created. The user selects edit annotation and edits the text content of the selected annotation. The user submits their changes. The DOD updates the selected annotation to reflect the user's changes and notifies the user that the update was successful.

Scenario 20a – User Cancels Editing Annotation

A Paid User or Admin User is logged into the DOD and has successfully toggled annotations on. The user selects an annotation that the user created. The user selects edit annotation and edits the text content of the selected annotation. However, the user cancels the update without submitting their changes. The DOD does not update the annotation.

Appendix A – Requirement Revisions

Changes from RD 1.0:

- Requirement tags were changed.
- Combined ‘search’ and ‘filter’ feature sections into ‘visualization’ feature section
- Added a new feature → Administration
- Removed user interface requirements as they are now addressed in functional requirements section
- Changed ‘system’ / ‘new system’ to DOD
- Glossary was heavily updated to clarify problems such as data sets/sensors, name of API, etc.
- Removed diagram from 4.2 ‘Communication Interfaces’
- Added authentication requirements to section 5.2.1 (Security)
- Got rid of user Interface section
- Added integration with Stripe

Appendix B – Data Flow Diagram Assembly

Data Flow Diagram 1

Below is the outline for assembling the Data Flow Diagram Level 1. Each number corresponds to the number labelled on each page (on the bottom right) of the Data Flow Diagram Level 1. Each cell in the table is representative of a page of the Data Flow Diagram Level 1.

Assembly for Data Flow Diagram Level 1

1	2

Data Flow Diagram 2

Below is the outline for assembling the Data Flow Diagram Level 2. Each number corresponds to the number labelled on each page (on the bottom right) of the Data Flow Diagram Level 2. Each cell in the table is representative of a page of the Data Flow Diagram Level 2.

Assembly for Data Flow Diagram Level 2

1	2
3	4