

# **Requirements Specification Document**

## **SureLock Storage Management System**

**Golf Island Software**

**March 27th, 2019**

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## Revision History

| Name   | Date                         | Reason for Changes  | Version |
|--|------------------------------|---|---------|
| Entire Team (Andy Smith, Eric Wiebe, Jared Larter, Jeremy Megyesi, Mona Soleimanieh, Rhett Devlin, Ryan Russell, Subah Mehrotra) | Feb. 28th, 2019              | Revisions from annotated RD1.1 and instructor feedback          | 0.8     |
| Entire Team  | Mar. 12th, 2019              | Creation of section 7 and addition of models                    | 0.9     |
| Entire Team  | Mar. 19th, 2019              | Revisions of RSD0.9 from client meeting feedback                | 1.0     |
| Entire Team  | Mar. 25 <sup>th</sup> , 2019 | Revision of RSD1.0 from client's RSD1.1 and instructor feedback | 1.2     |
| Entire Team  | Mar. 27 <sup>th</sup> , 2019 | RSD1.2 final review   | 2.0     |

## Table of Changes

| Section Number | Reason for change  | Changes  | RSD Version | Date                        |
|----------------|--|--|-------------|-----------------------------|
| 1              | Instructor feedback for RSD1.0 and client's RSD1.1                             | Rephrased the paragraph and fixed typos  | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 2              | Instructor feedback for RSD1.0 and client's RSD1.1                             | Fixed typos  | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 3.1            | Instructor feedback for RSD1.0   | Specified the map to the facility map  | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 7.1.1          | Instructor feedback for RSD1.0   | Improved the image quality and fixed typos   | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 7.1.2          | Instructor feedback for RSD1.0   | Reformatted the table and updated to be consistent with the ER diagram   | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 7.2            | Instructor feedback for RSD1.0   | Improved the readability of the data flow diagrams and the logic.  | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 7.3            | Instructor feedback for RSD1.0 and client's RSD1.1                             | Fixed notation for the sequence diagram. Added and improved the UI screens. Improved the readability of the use cases. | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| 7.4            | Instructor feedback for RSD1.0   | Fixed the notations in the use case model.   | 1.2         | Mar 26 <sup>th</sup> , 2019 |
| All Sections   | Readability  | Standardized terms   | 2.0         | Mar 27 <sup>th</sup> , 2019 |
| 7.5            | To make RSD2.0 verifiable  | Added traceability matrices  | 2.0         | Mar 27 <sup>th</sup> , 2019 |
| 4,5,6          | Instructor feedback for RSD1.0, client's RSD1.1, and to make RSD2.0 verifiable | Added rationale, test cases, and priority.   | 2.0         | Mar 27 <sup>th</sup> , 2019 |

# 1 Introduction

## 1.1 Purpose

This document details the requirements for the SureLock Storage Management System Version 2.0. SureLock's current system makes it difficult to track client information such as payment status and unit location. SureLock Storage seeks to improve company organization and management by making client and storage unit information easier to access, read, and parse. This document pertains to the entirety of the storage management system.

## 1.2 Project Scope

SureLock Storage's goal is to increase organization by implementing a software system to store and retrieve storage unit information. The information will include, unit number, unit dimensions, and unit availability. Additionally, client information including name, contact information, and current balance will be available on unit information. Unit and client information will be searchable, so users can find information quickly and easily. Having this information available in a system will enhance SureLock's organization by being readily updatable and accessible.

SureLock Storage hopes to increase company management and security by controlling who can edit and view client information. The storage management system will include Administrator and Staff Member accounts. This will limit the access of the Staff Members to ensure that client information is secure.

The storage management system will employ four main features: a storage facility information feature, a storage unit information feature, a system searching feature, and an account management feature. The four features will provide users with context of where storage units are located, the details of each unit, and who is renting the unit, in addition to making relevant information easily accessible and searchable.

## 1.3 Glossary of Terms

**[Storage] Units:** A locked room used to store the client's personal belongings. The floor space ranges from 4ft x 5ft to 10ft x 20ft.

**[Storage] Facility:** The property where the storage units are located. Currently, SureLock operates one facility with 200-225 units.

**IT Team:** A team of individuals trained to manage and troubleshoot the software system at a higher level than regular Staff Members. Each member of the IT Team has an Administrator account.

**Client:** The customer renting the storage unit from SureLock Storage.

**Client Information:** The full name, email, phone number, transaction documents and current balance unique to a specific client on a specific unit.

**Account:** An account is a set of credentials consisting of a unique username and a password. An account is required to access the storage management system. Each employee of SureLock Storage will have a unique account. Multiple accounts of each type can be created.

**Staff Member:** The account type for an employee who will be using the software system. The Staff Member accounts have limited access to client information.

**Administrator:** The account type for a manager or member of the IT Team of SureLock Storage who has access to all system features and client information.

**Transaction Documents:** Documents such as invoices and receipts that are generated manually or automatically as the result of a storage unit payment or owed amount.

## 1.4 References

- [1] SureLock Storage Client Group 1. (2019, Jan. 22). *SureLock Storage*. [Webpage]. Available: <https://ansh-projects.github.io/SENG321-websites/client.html#slogan>
- [2] SureLock Storage Client Group 1. (2019, Jan.). *Storage Management System Development Request for Proposal*. SureLock Storage. Victoria, BC. [Online]. Available: [https://ansh-projects.github.io/SENG321-websites/assets/group1\\_RFP.pdf](https://ansh-projects.github.io/SENG321-websites/assets/group1_RFP.pdf) [Accessed: Jan. 30, 2019].
- [3] Microsoft. *Microsoft Excel* [Online]. Redmond, WA: Microsoft, 2018. Available: <https://products.office.com/en-ca/excel>
- [4] Officer of the Information and Privacy Commissioner of Alberta. *PIPA* [Online]. Available: <https://www.oipc.ab.ca/legislation/pipa.aspx> [Accessed: Feb, 2019].

## 1.5 Overview

This requirements specification document (RSD) contains 7 sections, table of contents, list of tables and figures. The RSD begins by realizing the necessity of a software solution for SureLock Storage. Section 2 describes the overall description of the system that needs to be produced, how it will be used, who will use it, and the design constraints. Section 3 details the features and functional requirements of the system, as well as the rationale and test cases for each requirement. Section 4 describes how the system is to interface with SureLock Storage's current systems. Sections 5 and 6 describe the non-functional requirements of the system including performance, efficiency, security, and legal requirements. Section 7 contains the models of the system including the data dictionary, data flow diagrams, entity relationship diagrams, the use cases and use case model, and finally the traceability matrix.

## 2 Overall Description

### 2.1 Product Perspective

The storage management system currently being developed by Golf Island Software is a replacement for SureLock Storage's current unit management system. Currently, SureLock Storage gathers client information through email and uses Microsoft Excel to keep track of data including payment method, transaction history, current balance, and unit cost. This new software system will assist SureLock Storage in its goals to improve company organization and management. The usage of this system will be exclusively internal to SureLock Storage. Administrators will have full access to the system, while each Staff Member will have restricted access.

### 2.2 Product Features

The storage management system will include four main features: the storage facility information feature, the storage unit information feature, the system searching feature, and the account management feature. The storage facility information features a map of the storage units in the facility. The user will be able to access a unit's information by selecting the unit from the facility map. The storage unit information will include the clients full name, unit dimensions, unit cost, and current balance. Client information will also be viewable from the storage unit information interface and includes full name and email or phone number. Storage unit information and client information will be editable by Administrator. The searching feature will provide each Staff Member and Administrator with the ability to search through the storage units by unit number, client's full name, client's phone number, and client's email. Lastly, the account management feature ensures each Staff Member and Administrator have a unique username and password protected account.

### 2.3 User Classes and Characteristics

The two intended user groups for this system are the Administrators and Staff Members at SureLock Storage. The system will require each user to login with a unique username and a password.

The Administrator account is the highest-level account for the storage management system. An Administrator will have the ability to add, remove, and edit unit and client information. Additionally, an Administrator will be able to add new storage units to the system.

The Staff Member account will be restricted to accessing unit specific information (such as unit availability) and basic client information (full name, email, and phone number). Each Staff Member will not be able to access any sensitive client information (transaction documents and current balance). Moreover, the Staff Member will not be able to add or edit unit information, but the Staff Member will be able to add and edit annotations on unit information.

Stakeholders of the system consist of the Administrators and Staff Members of SureLock Storage.

## 2.4 Operating Environment

The new software system is to be run on the desktop computers at the SureLock Storage office area. The current operating system (OS) used on SureLock's office computers is Windows 7, so the software system must support Windows 7 and any Windows OS newer than Windows 7 to account for any new office computers or OS upgrades on current office computers at SureLock Storage.

The current system consists of recording data on a whiteboard and in Microsoft Excel spreadsheets [3].

## 2.5 Design and Implementation Constraints

### *Security*

The new system must be secure; the new system must be accessible to management personnel using an Administrator account specific to each individual, with each account having a corresponding username and password. Each Staff Member account must have access to the new system with their own username and password (specific to each individual). Each account is created and assigned by an Administrator. The new system must not be accessible by any external third parties or clients. A username and password are required to provide secure access.

### *System Access*

Each Administrator must have full access to updating and editing client information on the new system. Each Staff Member must be able to view information relating to storage unit availability and add necessary annotations but must not have access to any sensitive client information such as payment methods and transaction documents.

### *Transaction Documents*

The new system must retain all payment and transaction information dating two years prior.

### *Expansion*

The graphical interface of the new system must include a way to add storage units dynamically to support facility expansion. This expansion includes the addition of units to the current facility. The system must handle an increased number of devices that system will potentially operate on and simultaneous users to compensate for any facility expansion.

### *Budget*

The total cost of the project (development and implementation of the new system) must be within the given budget of \$50,000.

## 2.6 Assumptions and Dependencies

- Any future development will take place within the province of Alberta; there are currently no plans to expand outside of Alberta.
- Any new computers obtained for office use will have a modern Windows operating system (Windows 7 or later).
- While the system is to record transactions, the system is not required to interact with payments directly. Rather, a transaction may occur separately, and any pertinent documents will be uploaded and linked to the corresponding unit by an Administrator.
- A Staff Member is not responsible for adding a new client or updating client information. That is, only an Administrator will add or update client information.

# 3 System Features

This section details integral system features that will be implemented within a new system for SureLock Storage. The priority for each feature is noted in bold following the feature's description. Each system feature has one or more functional requirements.

## 3.1 Storage Facility Information

### 3.1.1 Description and Priority

Viewing information about the storage facility is the foundation of the system. The location of each unit in the facility will be viewable in the facility map.

**Priority:** High

### 3.1.2 Functional Requirements

**REQ-SFI-01:** Each Staff Member and Administrator must be able to view a map of the storage facility with the location of each unit.

- **Rationale:** Displaying the layout of the storage facility and the location of each unit is necessary in the overall system flow. The facility map also allows users to identify each unit location.
- **Priority:** High
- **TC-SFI-01.1:** Log in and verify that the map is viewable with an Administrator account.
- **TC-SFI-01.2:** Log in and verify that the map is viewable with a Staff Member account.

**REQ-SFI-02:** Each storage unit on the map must have a link to that unit's information.

- **Rationale:** Accessing each unit's information from the map is essential to the flow to the system. It allows users to access unit information without the need of searching. It allows a user to access unit information without knowledge other than the unit location in the facility.
- **Priority:** High

- **TC-SFI-02.1:** Select an arbitrary unit from the facility map and verify that the unit information is displayed on an Administrator Account.
- **TC-SFI-02.2:** Select a different unit than the one selected in TC2.1 from the facility map and verify that the unit information is displayed on a Staff Member Account.

**REQ-SFI-03:** Each storage unit's availability must be identifiable and displayed.

- **Rationale:** Identifying the unit's availability is necessary to ensure that users can find which storage units are available to assign to new clients. Availability is displayed on the map to prevent unnecessary steps to identify availability of each unit. Availability is also displayed in each the unit information for a specific unit so an Administrator or Staff Member can view it without reverting to the facility map view.
- **Priority:** High
- **TC-SFI-03.1:** Select a unit on the facility map that is coloured green. Verify that the box in the corner of the unit on the UI is not checked and that the unit availability is set to 'available' within the unit information.
- **TC-SFI-03.2:** Select a unit on the facility map that is coloured red. Verify that the box in the corner of the unit on the UI is checked and that the unit availability is set to 'not available' within the unit information.

**REQ-SFI-04:** Each Administrator must be able to assign a client to an available unit.

- **Exception:** If the unit already currently has an assigned client, the Administrator will not be able to assign an additional client to the unit.
- **Rationale:** Allowing only Administrators to assign a client to an available unit ensures system security. Having a client assigned to an available unit is the basis of the storage unit business. Ensuring that each unit does not currently have an assigned client makes sure that there is no conflict in payment for the unit.
- **Priority:** High
- **TC-SFI-04.1:** Follow the steps of UCSFI-02 to assign a unit to a client. Verify that the unit has been assigned a client. Verify that the unit is set to 'not available' via TC-SFI-03.2.

**REQ-SFI-05:** Each Administrator must be able to remove a client from a unit, which will set the unit to available.

- **Rationale:** Removing clients is necessary so that a unit can become available to be rented by a new client following the termination of a previous renter. Setting the unit availability will ensure that users can efficiently identify whether a unit is ready to be rented by a prospective client.
- **Priority:** High
- **TC-SFI-05.1:** Follow the steps of UCSFI-05. Verify that the client has been removed from the unit in the unit information. Verify that the unit is set to 'available' via TC-SFI-03.1.

**REQ-SFI-06:** Each Administrator must be able to add additional units, which will automatically update the map mentioned in REQ-SFI-01.

- **Rationale:** SureLock Storage is planning to expand the number of units at their current location. Therefore, accounting for the addition of new units will ensure that system is

usable if SureLock storage continues to expand. Having the map update allows for a consistent user experience in the event of expansion.

- **Priority:** High
- **TC-SFI-06.1:** Follow the steps of UCSFI-04. Verify that the newly created unit is visible on the facility map and that selecting the unit allows the user to view the correct unit information.

## 3.2 Storage Unit Information

### 3.2.1 Description and Priority

Viewing and editing storage unit information is essential to the system. Viewing storage unit information consists of viewing the information fields of a unit consisting of information about the specific unit and the client renting the storage unit from the facility. Editing storage unit information consists of editing the information fields.

#### **Priority: High**

### 3.2.2 Functional Requirements

**REQ-SUI-01:** Each Administrator must be able to view unit information.

- The information must include:
  - Unit Number
  - Unit Dimensions
  - Unit Availability
  - Unit Rent Cost
  - Unit Current Balance
  - Client's Full Name
- The information may include:
  - Client's Email
  - Client's Phone Number
  - Client's Payment Methods
  - Transaction Documents
  - Last Payment Date
  - Annotations
- **Rationale:** Viewing the above list of information is necessary for each Administrator to contact a client, to assess if a client has been paying their rent, to view important information regarding a specific unit, and to view related transaction documents among other uses.
- **Priority:** High
- **TC-SUI-01.1:** Verify all the unit information listed in REQ-SUI-01 is viewable from an Administrator account.

**REQ-SUI-02:** Each Staff Member must be able to view restricted unit information.

- The information must include:
  - Unit Number
  - Unit Dimensions

- Unit Availability
  - Unit Rent Cost
  - Client's Full Name
- The information may include:
  - Client's Email
  - Client's Phone Number
  - Annotations
- **Rationale:** While a Staff Member must be able to view the basic unit information specified in REQ-SUI-02, restricting the information available to each Staff Member ensures that the confidential information is secure.
- **Priority:** Medium
- **TC-SUI-02.1:** Verify the information listed in REQ-SUI-02 is viewable from an Staff Member account.
- **TC-SUI-02.2:** Verify that the sensitive client information (transaction documents, current balance, and payment information) is not viewable on the unit information from a Staff Member account.

**REQ-SUI-03:** Each Administrator must be able to edit unit information.

- The information must include:
  - Unit Dimensions
  - Unit Availability
  - Unit Rent Cost
  - Unit Current Balance
  - Client's Full Name
- The information may include:
  - Client's Email
  - Client's Phone Number
  - Client's Payment Methods
  - Transaction Documents
  - Last Payment Date
- **Rationale:** Because payments are consistently being made and the client renting a unit may change regularly, Administrators must be able to edit all pertinent unit information efficiently from the unit information view.
- **Priority:** High
- **TC-SUI-03.1:** Verify that all Administrator accounts have access to the editable unit information screen.
- **TC-SUI-03.2:** Verify that all Staff Member accounts do not have access to the editable unit information screen.
- **TC-SUI-03.3:** Follow the steps of UCSUI-06. Verify that all Administrator accounts can edit the unit information specified in REQ-SUI-03 and that the information is successfully updated.

**REQ-SUI-04:** Each Staff Member and Administrator must be able to add and edit annotations on the unit information.

- **Rationale:** In order to account for information that is not included in the unit information fields, users must be able to add annotations to units. This will allow for more specific details regarding the unit and corresponding client to be added.

- **Priority:** Low
- **TC-SUI-04.1:** Follow the steps of UCSUI-03. Verify that an annotation has successfully been added to the unit information.
- **TC-SUI-04.2:** Follow the steps of UCSUI-04. Verify that the annotation has successfully been removed from the unit information.

**REQ-SUI-05:** Each Administrator must be able to upload and delete transaction documents associated with specific units.

- **Rationale:** Uploading transaction documents allows each Administrator to create a payment history of a specific unit. Deleting transaction documents allows each Administrator to remove documents that are no longer relevant or include incorrect information.
- **Priority:** Medium
- **TC-SUI-05.1:** Follow the steps of UCSUI-05 until the alternate path is reached. Follow the alternate path and refer to the corresponding UI model. Verify that the transaction document has been successfully uploaded.
- **TC-SUI-05.2:** Remove a transaction document from the unit which a document was uploaded to in TC-SUI-05.1. Verify that the document has been successfully deleted.

### 3.3 System Searching Feature

#### 3.3.1 Description and Priority

Searching for storage unit, transaction documents, and client information is useful for users to quickly find relevant documents and information when interacting with the system.

**Priority:** High

#### 3.3.2 Functional Requirements

**REQ-SSF-01:** Each Staff Member and Administrator must be able to search for a unit by the following information:

- Client's Full Name
- Client's Email
- Client's Phone Number
- Unit Number
- Unit Availability
- **Rationale:** Searching for a unit based on the criteria identified above allows each Staff Member and Administrator to view the desired unit information without knowing the unit's location on the facility map.
- **Priority:** High
- **TC-SSF-01.1:** Select 'search by Full Name' from the dropdown list next to the search bar and enter a client's name. Verify that the system displays each unit with a client full name that matches the entered name and that clicking on a specific unit opens the "Unit Information" page of that specific unit.
- **TC-SSF-01.2:** Select 'search by Email' from the dropdown list next to the search bar and enter client's email. Verify that the system displays each unit with an email that matches

the entered email and that clicking on a specific unit opens the “Unit Information” page of that specific unit.

- **TC-SSF-01.3:** Select ‘search by Phone Number’ from the dropdown list next to the search bar and enter client’s phone number. Verify that the system displays each unit with a number that matches the entered phone number and that clicking on a specific unit opens the “Unit Information” page of that specific unit.
- **TC-SSF-01.4:** Select ‘search by Unit Number’ from the dropdown list next to the search bar and enter a unit number. Verify that the system displays each unit with a unit number that matches the entered unit number and that clicking on a specific unit opens the “Unit Information” page of that specific unit.
- **TC-SSF-01.5:** Check the “Available Units” box beside the searching bar and verify that the system displays each available unit.

**REQ-SSF-02:** Each Administrator must be able to search the archived transaction documents by the following information:

- File Name
- Associated Unit Number
- Associated Client’s Full Name
- **Rationale:** SureLock Storage has stipulated that the system must store client transaction documents for two years after the client pays off debts and ceases renting units. When a unit is removed from a unit, the transaction documents corresponding to that unit and client are stored as archived transaction documents. Being able to search through these documents is an important requirement for Administrators if a previous client would like to rent a new unit from SureLock Storage.
- **Priority:** Medium
- **TC-SSF-02.1:** Follow the steps of UCSSF-04. Verify that the desired transaction document can be accessed and downloaded.

## 3.4 Account Management Feature

### 3.4.1 Description and Priority

Account management is crucial to usage of the overall system. The account management system consists of logging in and out of the system, as well as creating new accounts for Administrators and Staff Members.

**Priority:** High

### 3.4.2 Functional Requirements

**REQ-AMF-01:** Each Staff Member and Administrator must enter a unique username and password to sign into their personal account.

- **Rationale:** Unique usernames and passwords provide the baseline security for SureLock Storage in order to prevent external entities from accessing the Storage Unit Management System. Requiring to enter username and password for logging in allow the system to identify between an Administrator and a Staff Member account. It is necessary each Administrator account should be able to view any information without restriction, and each Staff Member account should only be able to see limited

information. This requirement is duplicated in the Security Requirements section as REQ-NF-06.

- **Priority:** Medium
- **TC-AMF-01.1:** Verify that an Administrator cannot log in to the system without first entering their unique username and password.
- **TC-AMF-01.2:** Verify that a Staff Member cannot log in to the system without first entering their unique username and password.
- **TC-AMF-01.3:** Verify that there are no duplicate usernames for activated accounts in the system.

**REQ-AMF-02:** Each Staff Member and Administrator must be able to log out of their account.

- **Rationale:** Multiple users operate on the same device at SureLock Storage. Logging out of the system allows each user to secure their account before another user accesses the system.
- **Priority:** High
- **TC-AMF-02.1:** Follow the steps of UCAM-02 with an Administrator account. Verify that Administrator is successfully logged out of the system.
- **TC-AMF-02.2:** Follow the steps of UCAM-02 with a Staff Member account. Verify that Staff Member is successfully logged out of the system.

**REQ-AMF-03:** Each Administrator must be able to create an Administrator account and a Staff Member account with a unique username and password.

- **Exception:** If a username is already in use, it cannot be used to create a new account.
- **Rationale:** Accounts are necessary for accessing the system. Accounts should only be able to be created by Administrators in order to ensure that only qualified individuals can access the system. This process also limits the number of accounts active in the system.
- **Priority:** High
- **TC-AMF-03.1:** Follow the steps of UCAM-03 to create a new Staff Member account. Verify that the Staff Member account is created successfully.
- **TC-AMF-03.2:** Follow the steps of UCAM-03 to create a new Administrator account. Verify that the Administrator account is created successfully.

## 4 External Interface Requirements

### 4.1 Software Interfaces

**REQ-EI-01:** Each Administrator must be able to import and export Microsoft Excel documents.

- **Rationale:** SureLock Storage currently uses an excel spreadsheet to manage the client information. It is necessary to store the data in a format that is familiar to the staff at SureLock Storage.
- **Priority:** Low
- **TC-EI-01.1:** Upload a Microsoft Excel document to the system and verify the data uploaded matches the data in the original Microsoft Excel document.
- **TC-EI-01.2:** Download an archived document from the system, open the document and verify if the data in the downloaded document is in Excel format and is correct..

**REQ-EI-02:** Each Staff Member and Administrator must be able to operate the system in Microsoft Windows 7, 8, 8.1, or 10.

- **Rationale:** The computers at SureLock Storage run on Microsoft Windows 7. SureLock Storage may consider updating their operating system in future.
- **Priority:** High
- **TC-EI-02.1:** Verify that opening the system in Microsoft Windows 7, logging in as an Administrator, creating a new unit and downloading an archived document are each successful.
- **TC-EI-02.2:** Verify that opening the system in Microsoft Windows 8, logging in as an Administrator, creating a new unit and downloading an archived document are each successful.
- **TC-EI-02.3:** Verify that opening the system in Microsoft Windows 8.1, logging in as an Administrator, creating a new unit and downloading an archived document are each successful.
- **TC-EI-02.4:** Verify that opening the system in Microsoft Windows 10, logging in as an Administrator, creating a new unit and downloading an archived document are each successful.

## 5 Other Non-Functional Requirements

### 5.1 Performance Requirements

**REQ-NF-01:** Searching for a storage unit in the system should take fewer than 5 seconds.

- **Rationale:** SureLock Storage stipulated that they desired an efficient system in order to search unit information. Currently, Staff Members at SureLock must go through an excel spreadsheet to find information about a specific storage unit.
- **Priority:** Medium
- **TC-NF-01.1:** Select search by “Unit Number” from the dropdown list beside the searching bar and enter a unit number. Verify that the system displays all units related to the entered unit number in less than 5 seconds.
- **TC-NF-01.2:** Select search by “Full Name” from the dropdown list beside the searching bar and enter client’s name. Verify that the system displays all units related to the entered name in less than 5 seconds.
- **TC-NF-01.3:** Select search by “Phone Number” from the dropdown list beside the searching bar and enter client’s phone number. Verify that the system displays all units related to the entered phone name in less than 5 seconds.
- **TC-NF-01.4:** Select search by “Email” from the dropdown list beside the searching bar and enter client’s email. Verify that the system displays all units related to the entered email in less than 5 seconds.

**REQ-NF-02:** Opening the system should take no more than 1 minute.

- **Rationale:** The Administrator will be opening the system for viewing or updating unit information. If the system were not to open in 1 minute, the goal of an efficient system would not be achieved and Administrators may seek another avenue of discovering the desired information.

- **Priority:** Medium
- **TC-NF-02.1:** Verify that opening the system in a browser and logging in takes less than 1 minute.

**REQ-NF-03:** Processing new clients or storage units in the system should take within 5 seconds.

- **Rationale:** SureLock Storage also desired an efficient system to process new clients and storage units. Their current system of writing unit information on a whiteboard and then copying it on an excel sheet is inefficient.
- **Priority:** Medium
- **TC-NF-03.1:** Verify saving takes less than 5 seconds after a new unit is assigned to a client.
- **TC-NF-03.2:** Verify saving takes less than 5 seconds after adding a new storage unit in the facility map.

**REQ-NF-04:** Each map must support the display of at least 500 storage units.

- **Rationale:** SureLock Storage currently have between 200 to 225 units in their facility and has plans to expand the current facility. SureLock has expressed the desire to have up to 500 storage units available at the current facility.
- **Priority:** High
- **TC-NF-04.1:** Verify that up to 500 storage units can be added to the facility map. Apply boundary value analysis and equivalence partitioning techniques with this value.

**REQ-NF-05:** At least five users must be able to simultaneously use the system.

- **Rationale:** There could be instances where more than one Administrator at SureLock Storage want to use the system. The system should be able to support multiple users (up to 5) simultaneously, specially after SureLock Storage adds a new facility.
- **Priority:** Medium
- **TC-NF-05.1:** Verify that the system is usable with 5 simultaneous users by performing other test cases concurrently. Ensure that the system does not crash.

## 5.2 Security Requirements

**REQ-NF-06:** Each Staff Member and Administrator must enter a unique username and password to sign into their personal account.

- **Rationale:** Unique usernames and passwords provide the baseline security for SureLock Storage in order to prevent external entities from accessing the Storage Unit Management System. Requiring to enter username and password for logging in allow the system to identify between an Administrator and a Staff Member account. It is necessary each Administrator account should be able to view any information without restriction, and each Staff Member account should only be able to see limited information. This requirement is duplicated in the Account Management Feature section as REQ-AMF-01.
- **Priority:** Medium
- **TC-NF-06.1:** Verify that an Administrator cannot log in to the system without first entering their unique username and password.
- **TC-NF-06.2:** Verify that a Staff Member cannot log in to the system without first entering their unique username and password.

- **TC-NF-06.3:** Verify that there are no duplicate usernames for activated accounts in the system.

**REQ-NF-07:** Passwords must not be viewable by default.

- **Rationale:** A password not being visible while entering is necessary for keeping each Administrator and Staff Member account secure. Since the system stores client's personal information, it is important to keep each password hidden.
- **Priority:** High
- **TC-NF-07.1:** Enter the password on the logging in page and verify that the password is not visible while entering.

**REQ-NF-08:** Each Administrator account must not be restricted from any information in the system.

- **Rationale:** The system has two levels of hierarchy. Since each Staff Member account has restricted access to client information and the Administrator account is the highest level in the hierarchy, it is necessary for each Administrator account to be able to access all the information on the system.
- **Priority:** High
- **TC-NF-08.1:** Open the "Unit Information" page of a specific unit and verify that all of the categories listed in REQ-SUI-01 are viewable on an Administrator account.

**REQ-NF-09:** Unit information pertaining to a specific client must be automatically deleted 2 years after the client pays off debts and ceases renting units.

- **Rationale:** Deleting unit information after 2 years is necessary, because it contains confidential information of a client. Automatically deleting the unit information will prevent each Administrator from forgetting to delete unit information after 2 years.
- **Priority:** High
- **TC-NF-09.1:** Check that there is no unit information available after 2 years has elapsed since a client ceased renting a unit.

**REQ-NF-10:** Each Administrator with an existing account must be able to create a new Staff Member or Administrator account.

- **Rationale:** The system has two levels of hierarchy. Since each Staff Member account has restricted access and is not able to create new accounts, it is necessary for each Administrator account to be able to create new accounts.
- **Priority:** High
- **TC-NF-10.1:** Check that each Administrator account is able to create new accounts.

**REQ-NF-11:** Each Administrator must have access to a list of each Staff Member and Administrator Account password.

- **Rationale:** Each Administrator account having access to a list of each account password is necessary when an Administrator or a Staff Member forget their password.
- **Priority:** Medium
- **TC-NF-11.1:** Check that each Administrator account is able to view a list of passwords.

## 5.3 Software Quality Attributes

**REQ-NF-12:** The system should be manageable and maintainable by the IT team.

- **Rationale:** Being able to manage and maintain the system within SureLock Storage's own IT team is necessary for operating the system smoothly.
- **Priority:** High
- **TC-NF-12.1:** Verify that the IT team deems the system both manageable and maintainable.

## 6 Other Requirements

**REQ-NF-13:** The client information within the storage unit must be compliant with Alberta's Personal Information Protection Act [4].

- **Rationale:** The system stores client sensitive personal information, such as full name, phone number, email address, and address. Therefore, it is important that the client information is compliant with Alberta's Personal Information Protection Act.
- **Priority:** Medium
- **TC-NF-13.1:** Consult with legal counsel to verify that the information is compliant with Alberta's Personal Information Act.

# 7 Models and Diagrams

## 7.1 Data Modelling

### 7.1.1 Entity Relationship Diagram

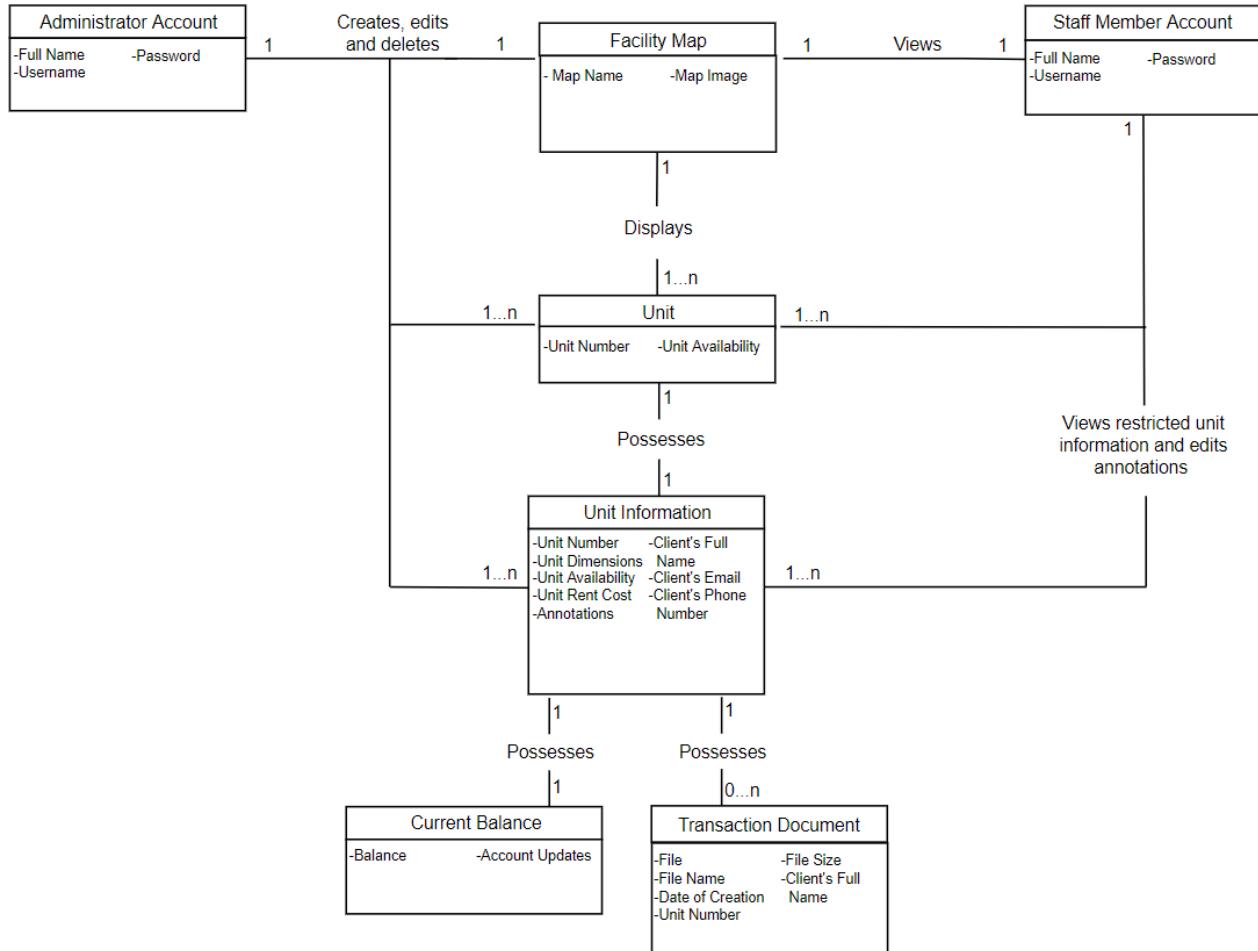


Figure 1. Entity Relation Diagram

### 7.1.2 Data Dictionary

| <b>Entity:</b>        | <b>Attribute:</b>     | <b>Data Type:</b>   |
|-----------------------|-----------------------|---------------------|
| Administrator Account | Full Name             | <i>String</i>       |
| Administrator Account | Username              | <i>String</i>       |
| Administrator Account | Password              | <i>String</i>       |
| Staff Member Account  | Full Name             | <i>String</i>       |
| Staff Member Account  | Username              | <i>String</i>       |
| Staff Member Account  | Password              | <i>String</i>       |
| Facility Map          | Map Name              | <i>String</i>       |
| Facility Map          | Map Image             | <i>Image file</i>   |
| Unit                  | Unit Number           | <i>Int</i>          |
| Unit                  | Unit Availability     | <i>String</i>       |
| Unit Information      | Unit Number           | <i>Int</i>          |
| Unit Information      | Unit Dimensions       | <i>Int array</i>    |
| Unit Information      | Unit Availability     | <i>String</i>       |
| Unit Information      | Unit Rent Cost        | <i>String</i>       |
| Unit Information      | Client's Full Name    | <i>String</i>       |
| Unit Information      | Client's Email        | <i>String</i>       |
| Unit Information      | Client's Phone Number | <i>String</i>       |
| Unit Information      | Annotations           | <i>String</i>       |
| Current Balance       | Balance               | <i>Float</i>        |
| Current Balance       | Account Updates       | <i>String array</i> |
| Transaction Document  | File                  | <i>File (.*)</i>    |
| Transaction Document  | File Name             | <i>String</i>       |
| Transaction Document  | Date of Creation      | <i>Int</i>          |

|                      |                         |               |
|----------------------|-------------------------|---------------|
| Transaction Document | File Size               | <i>Int</i>    |
| Transaction Document | Client's Full Name      | <i>String</i> |
| Transaction Document | Unit Number             | <i>Int</i>    |
| Transaction Document | Transaction Document ID | <i>Int</i>    |

*Table 1. Data Dictionary*

## 7.2 Data Flow Diagrams

Figure 3.1 (see next page) shows the context diagram (DFD 0) and the Level 1 Data Flow Diagram (DFD 1). The context diagram shows data-transfer between the entities (Administrator and Staff Member) and the Storage Management System, while the DFD 1 shows a breakdown of the four basic processes (with respective data flow) contained within the Storage Management System.

All data flow diagrams in this section adhere to the legend below (Figure 2):

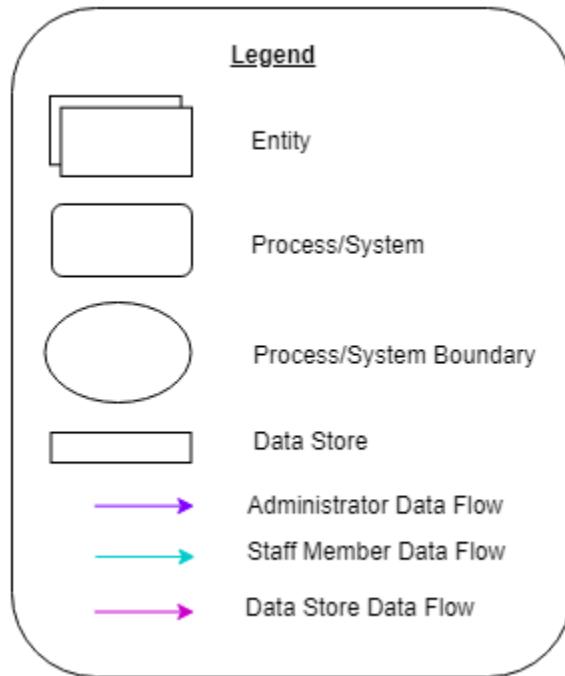


Figure 2: Data Flow Diagram Legend

## STORAGE MANAGEMENT SYSTEM - DATA FLOW DIAGRAMS

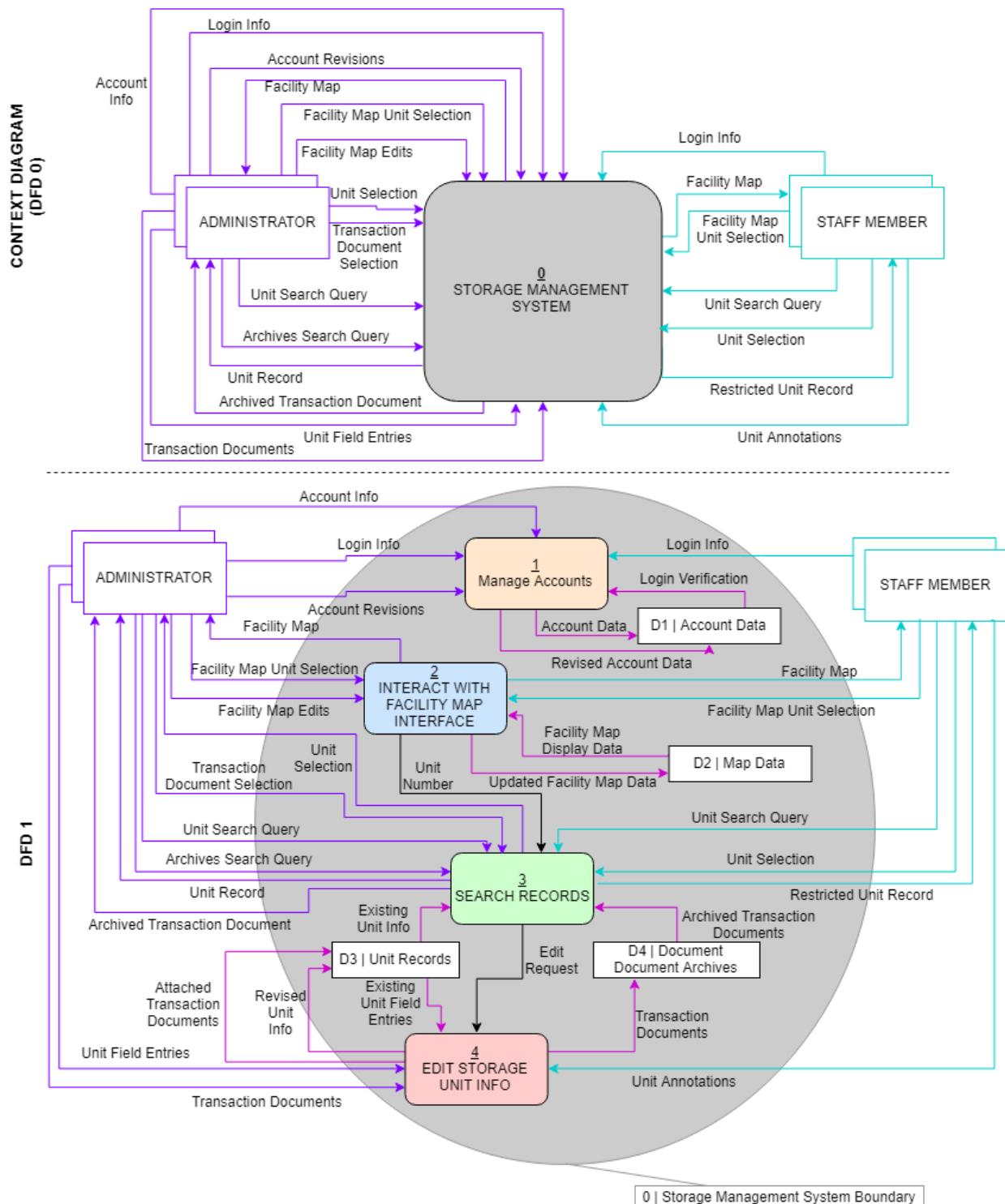


Figure 3.1: Level 0 and Level 1 Data Flow Diagrams

The Level 2 Data Flow Diagram (DFD 2) shows further breakdown of each of the four basic processes contained within the Storage Management System (see Figure 3.2 below). The colours of each of the four basic processes seen in DFD 1 (Figure 3.1) correspond to the background colour that groups the subprocesses (ie. subprocesses 1.1, 1.2, and 1.3 are grouped by an orange background, and therefore correspond to the ‘Manage Accounts’ process seen in the DFD 1).

Figure 2.3 below shows the DFD 2 in its entirety. The subsequent figures (Figures 3.2.1, 3.2.2, 3.2.3, and 3.2.4) show a closer look at different areas of the DFD 2.

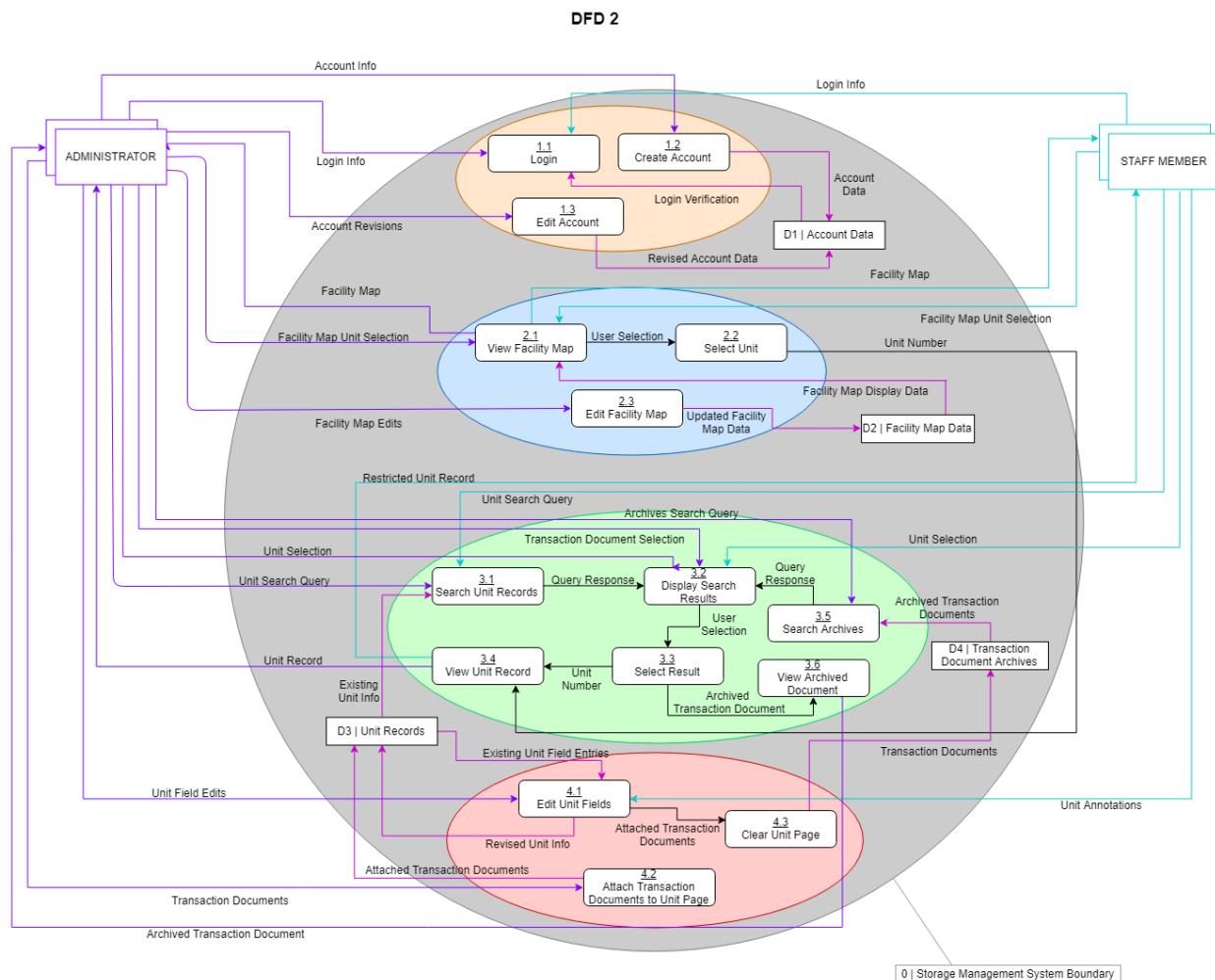


Figure 3.2: Level 2 Data Flow Diagram Overview

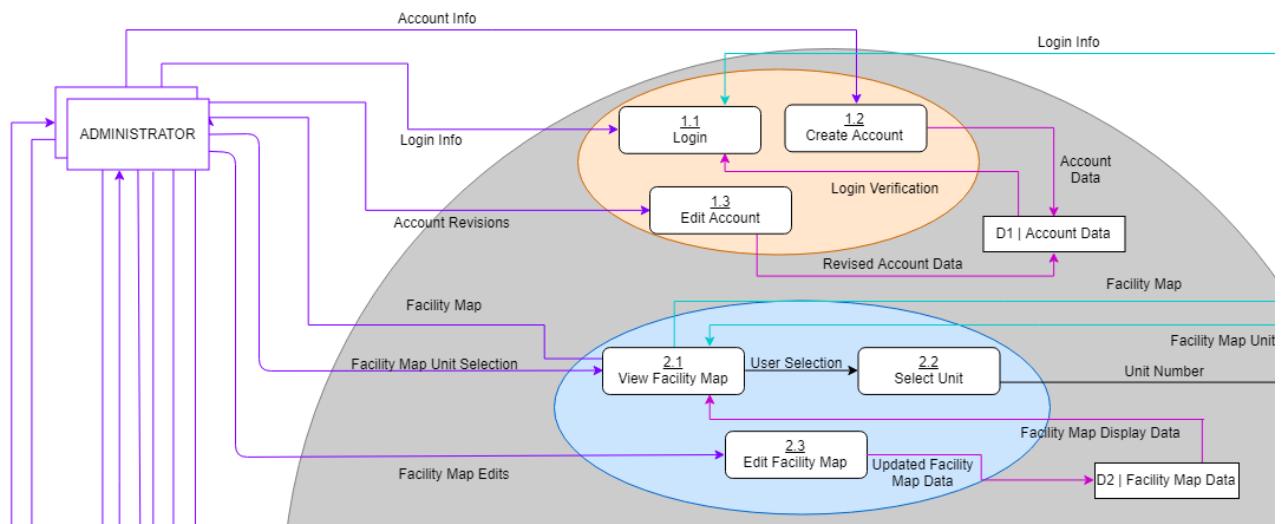


Figure 3.2.1: Close up view of DFD 2's first quadrant

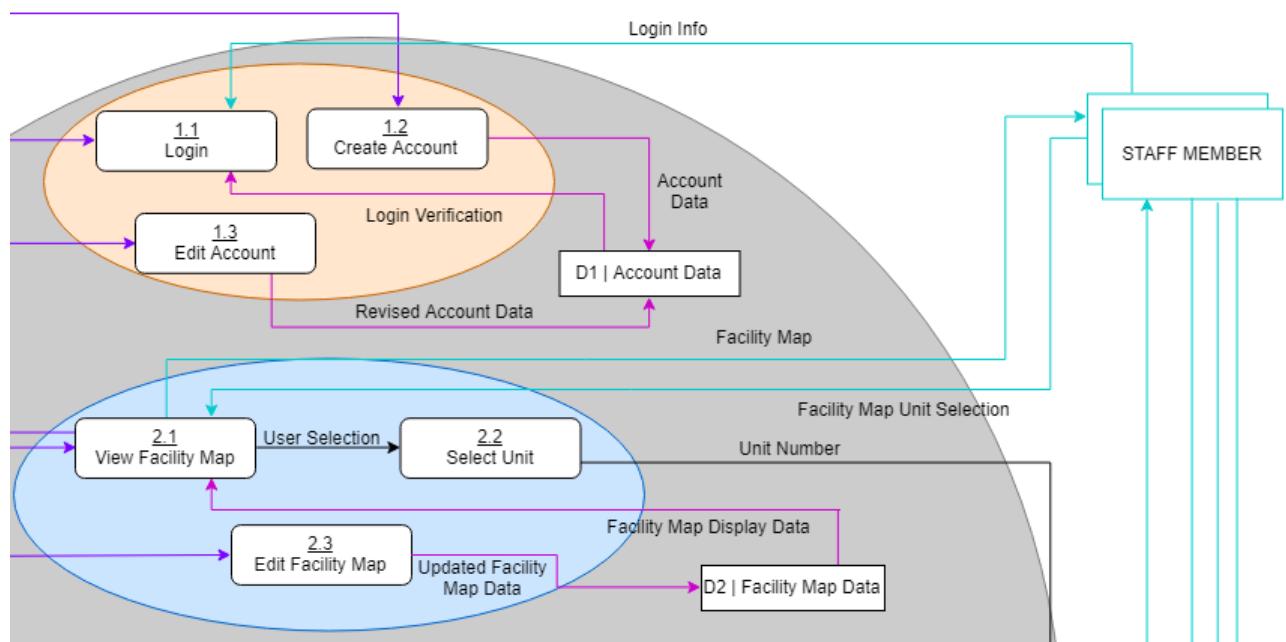


Figure 3.2.2: Close up view of DFD 2's second quadrant

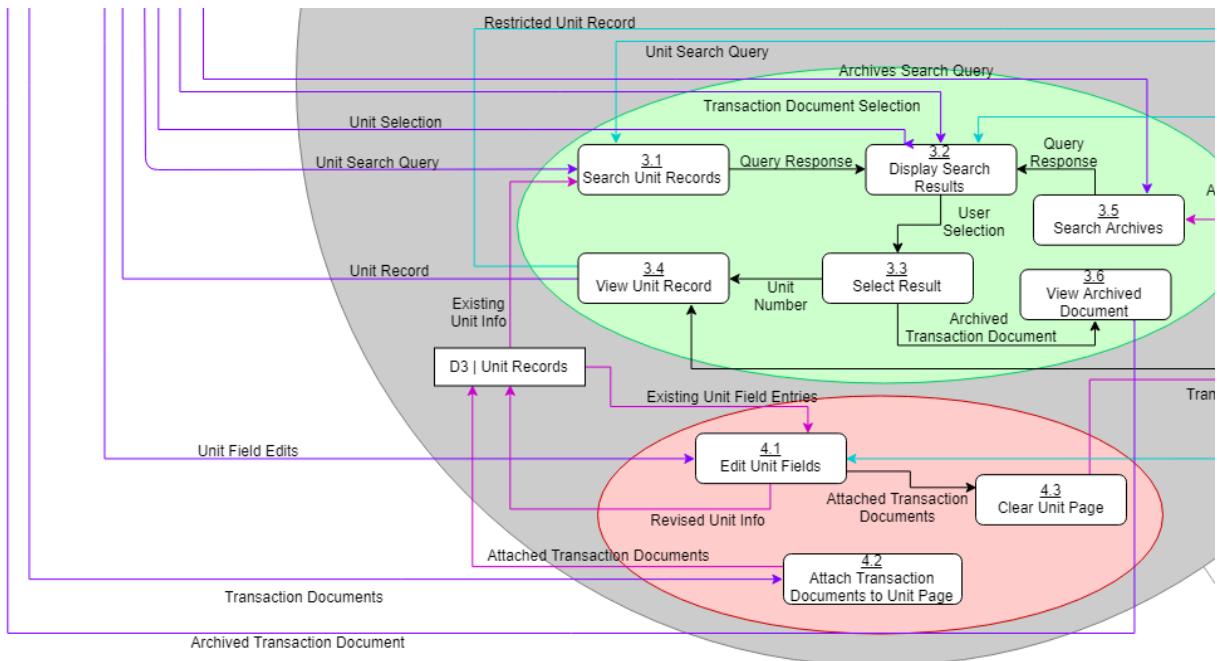


Figure 3.2.3: Close up view of DFD 2's third quadrant

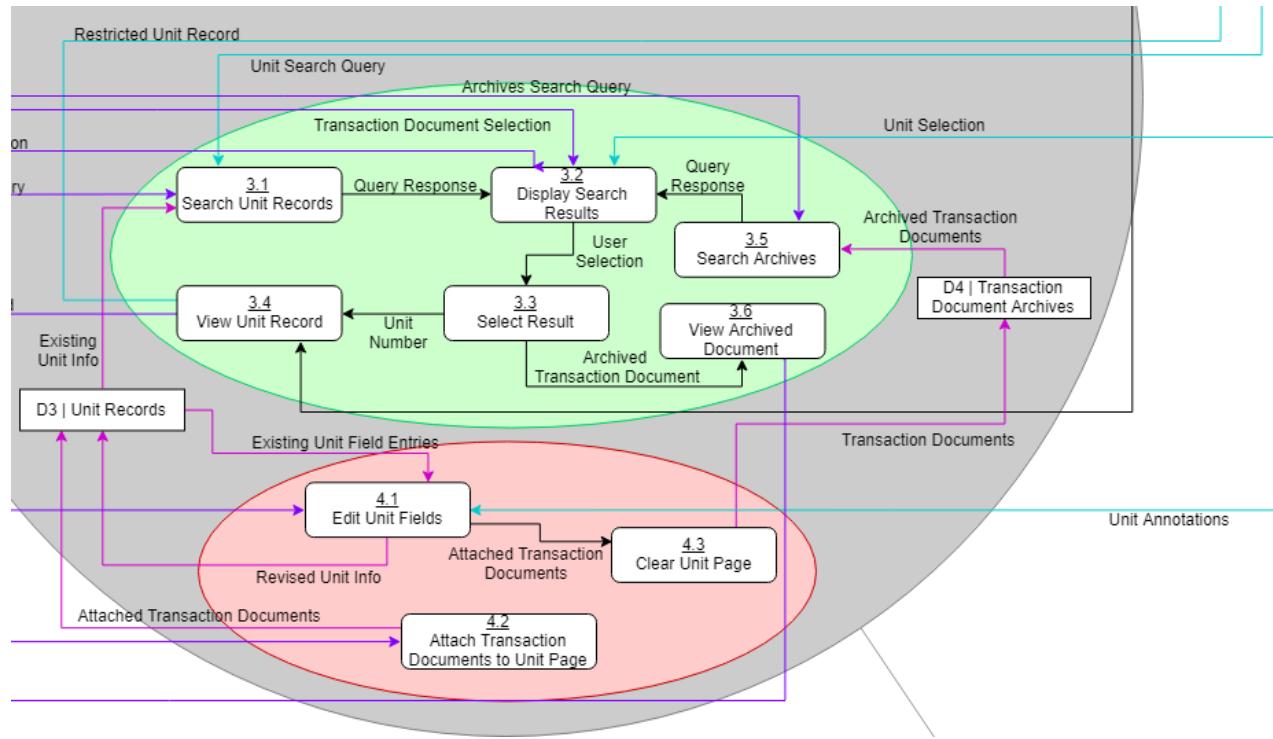


Figure 3.2.4: Close up view of DFD 2's fourth quadrant

## 7.3 Use Cases and Sequence Diagrams

### 7.3.1 Account Management Use Cases

#### Use Case UCAM-01: Logging In

Actors: Administrators and Staff Members

Precondition: The user has a valid account.

Steps:

1. The user enters their username and password
2. The user submits their entered username and password

Success Condition: The user will be logged into the system and is directed to the facility map screen. The user will have security access based on their account type.

Exception: 2a) The username and password are not associated with an account. The use case ends.

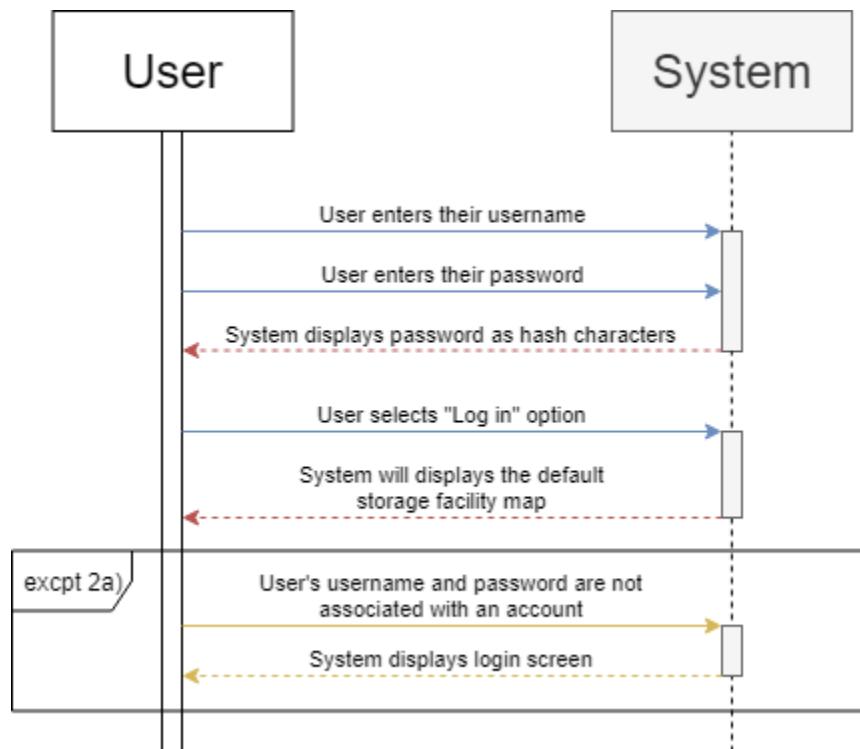


Figure 4: UCAM-01 Sequence Diagram

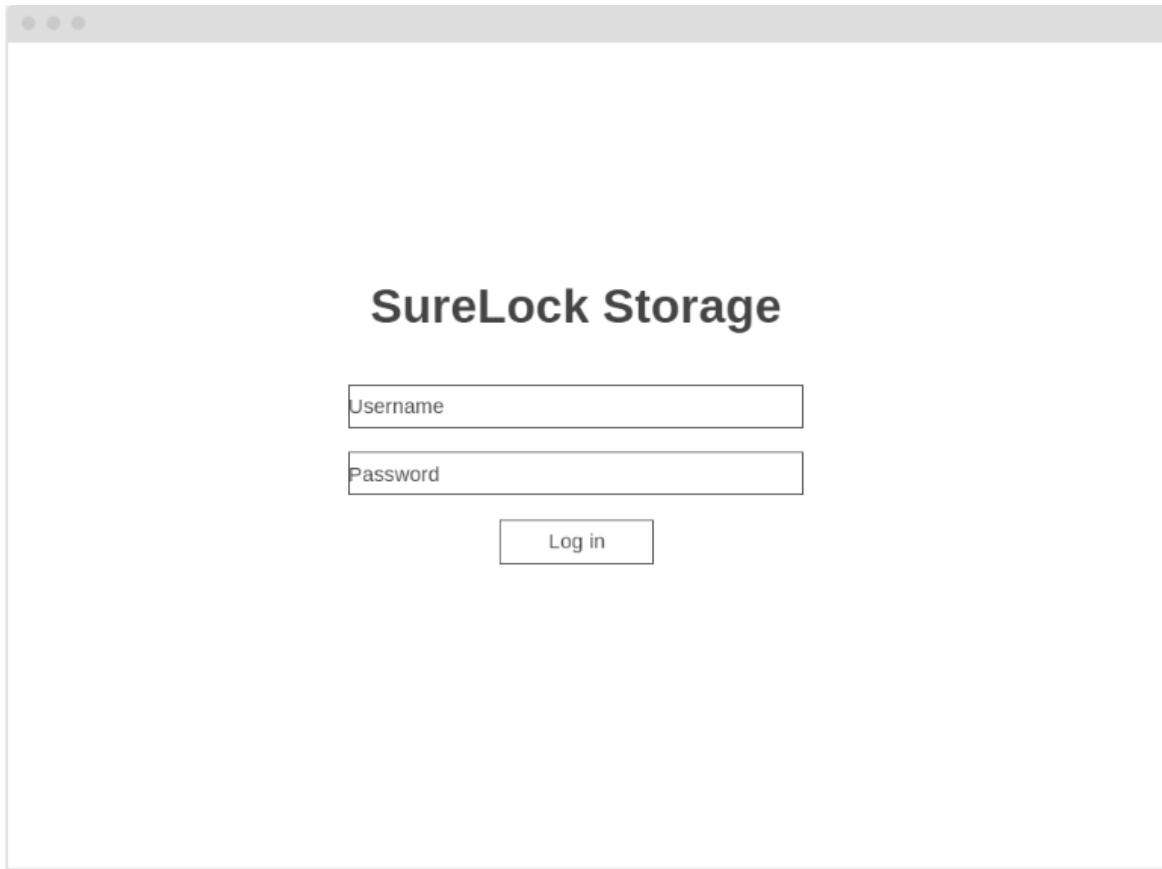


Figure 4.1: UCAM-01 UI Screen 1 – Login Screen

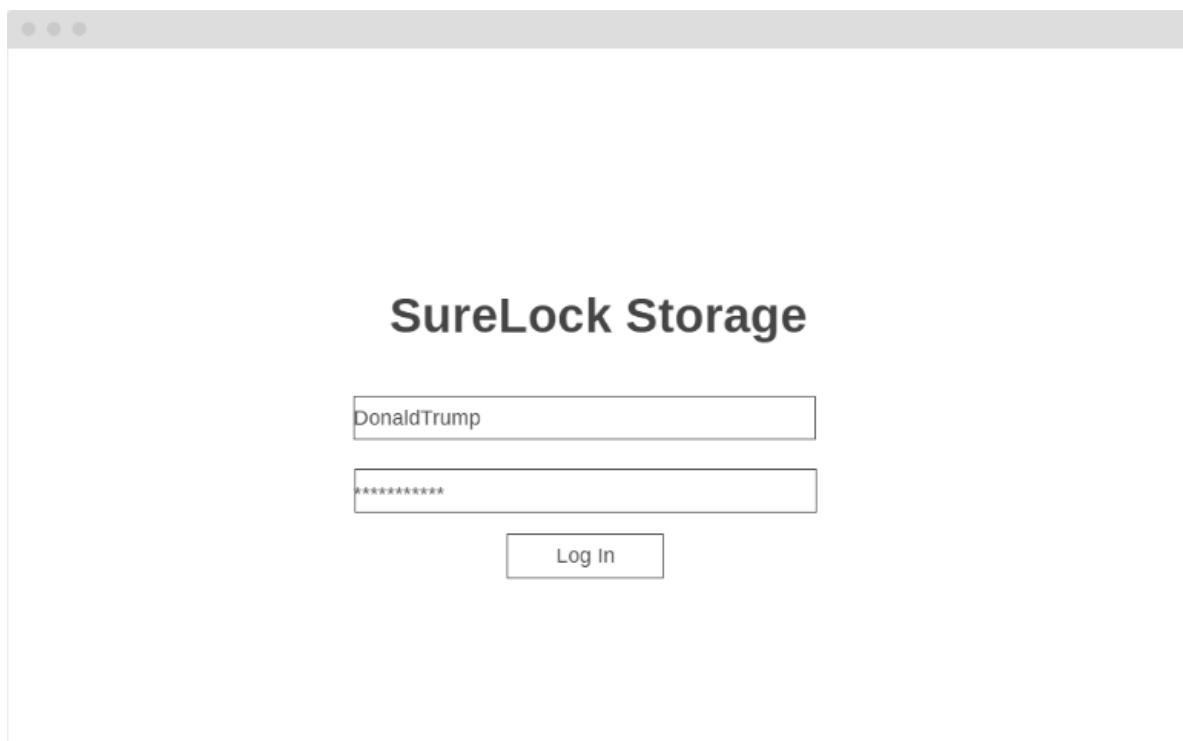


Figure 4.2: UCAM-01 UI Screen 2 – Login Screen with Username and Password

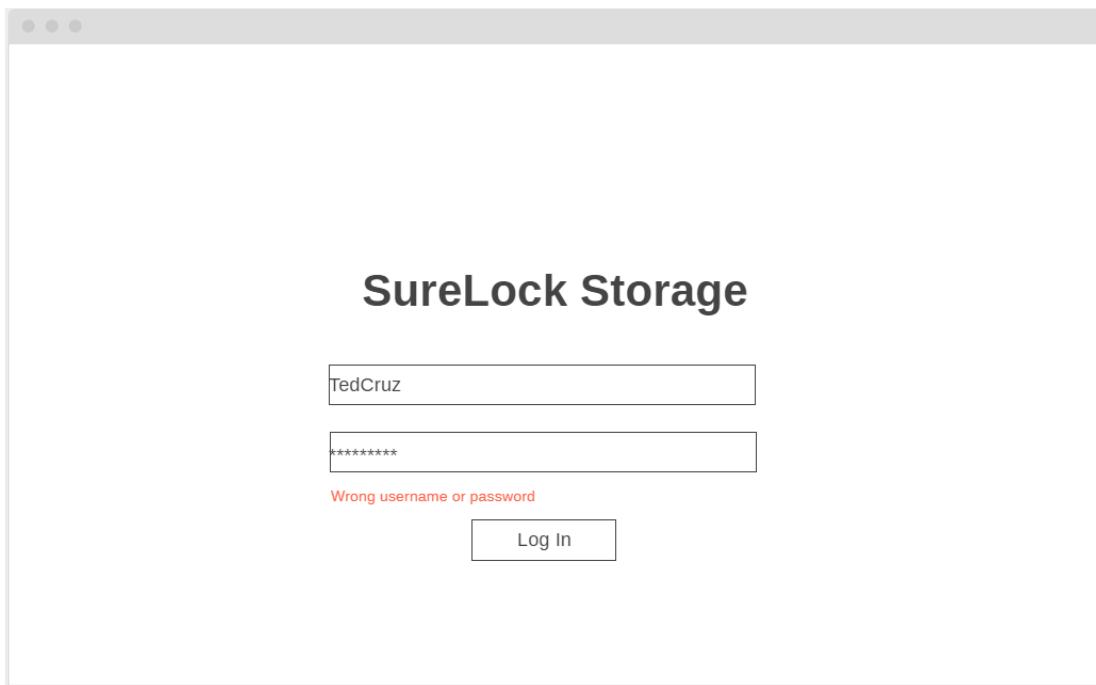


Figure 4.3: UCAM-01 Exception 2a: UI Screen 1 – Login Screen with Wrong Username or Password message



Figure 4.4: UCAM-01 UI Screen 3 – Facility Map Screen Showing Administrator-only buttons

The user clicks the “Log In” button after entering their username and password. The user is directed to the facility map screen and have security access based on their account type.

## Use Case UCAM-02: Logging Out

Actors: Administrators and Staff Members

Precondition: The user is logged into the system under a valid account

Steps:

1. The user selects to log out
2. The user is prompted to confirm their logout selection
3. The user confirms their selection to log out

Success Condition: The user will be logged out of the system

Exception: 2a) The user cancels log out. User is returned to the previous screen. The use case ends.

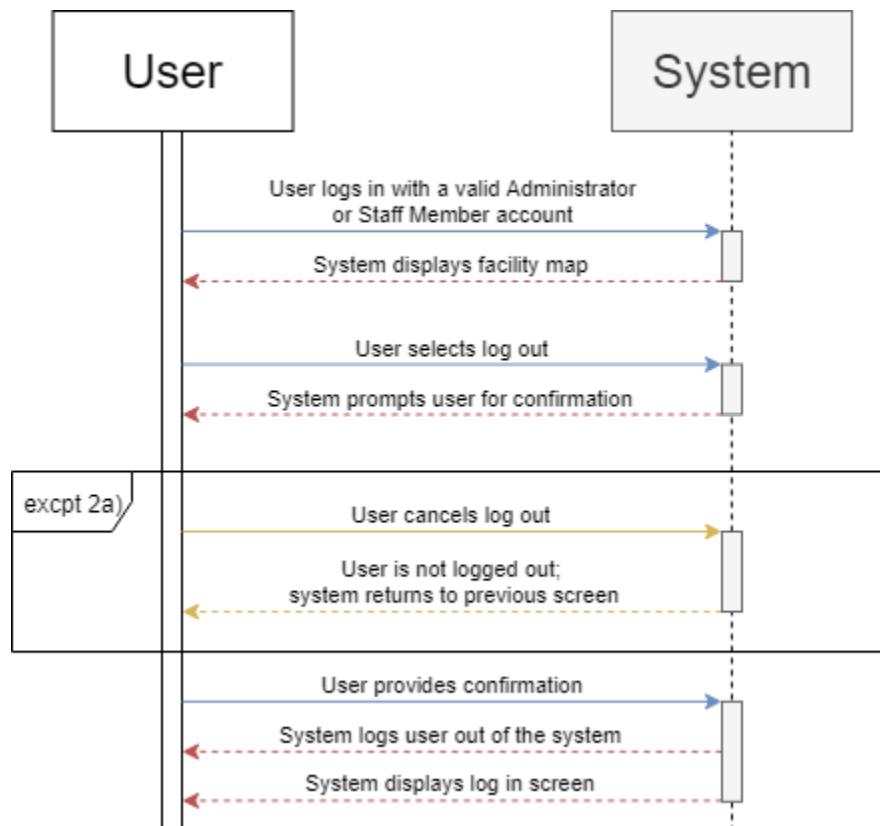


Figure 5: UCAM-02 Sequence Diagram

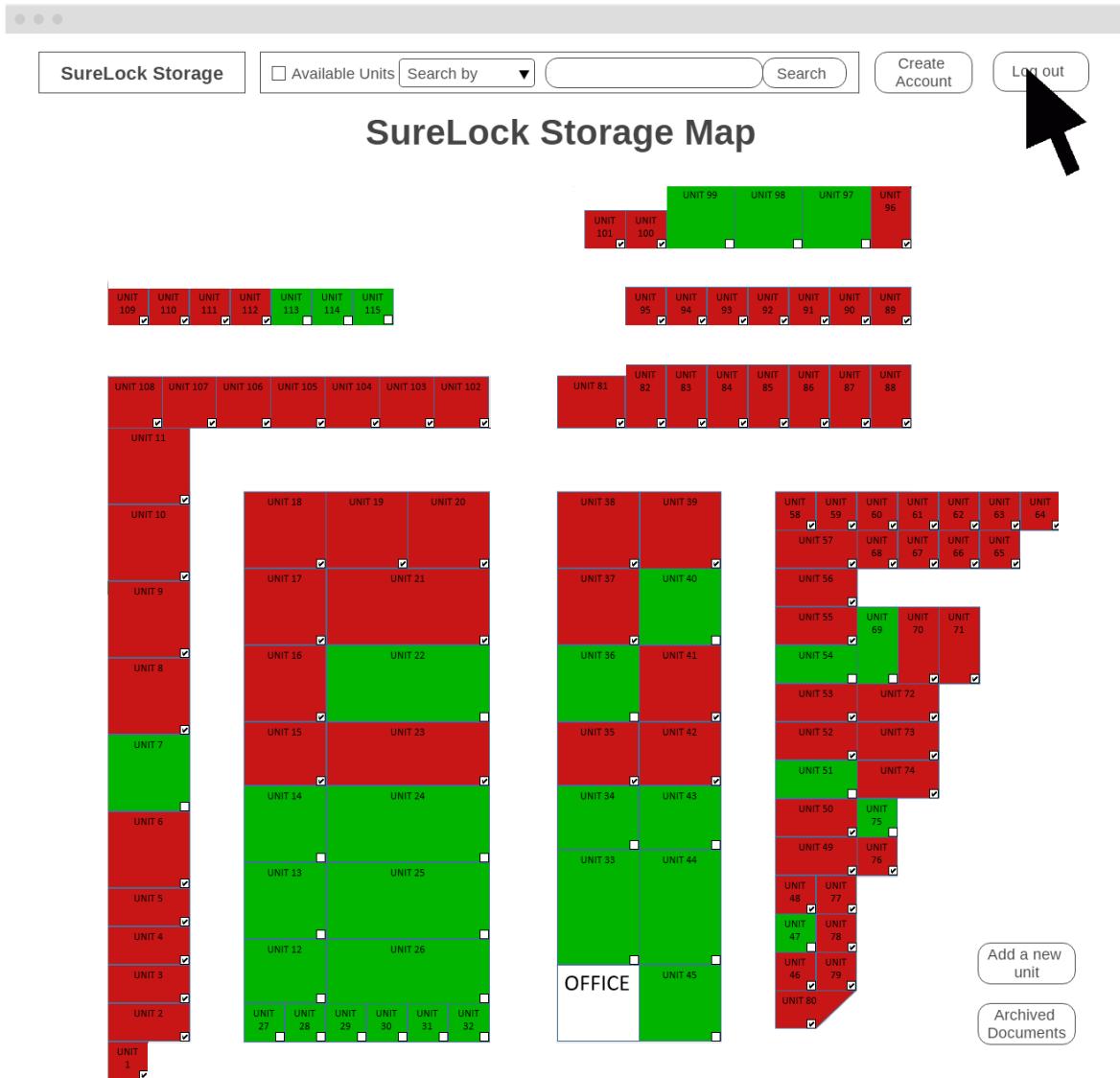


Figure 5.1: UCAM-02 UI Screen 1 – Facility Map Screen

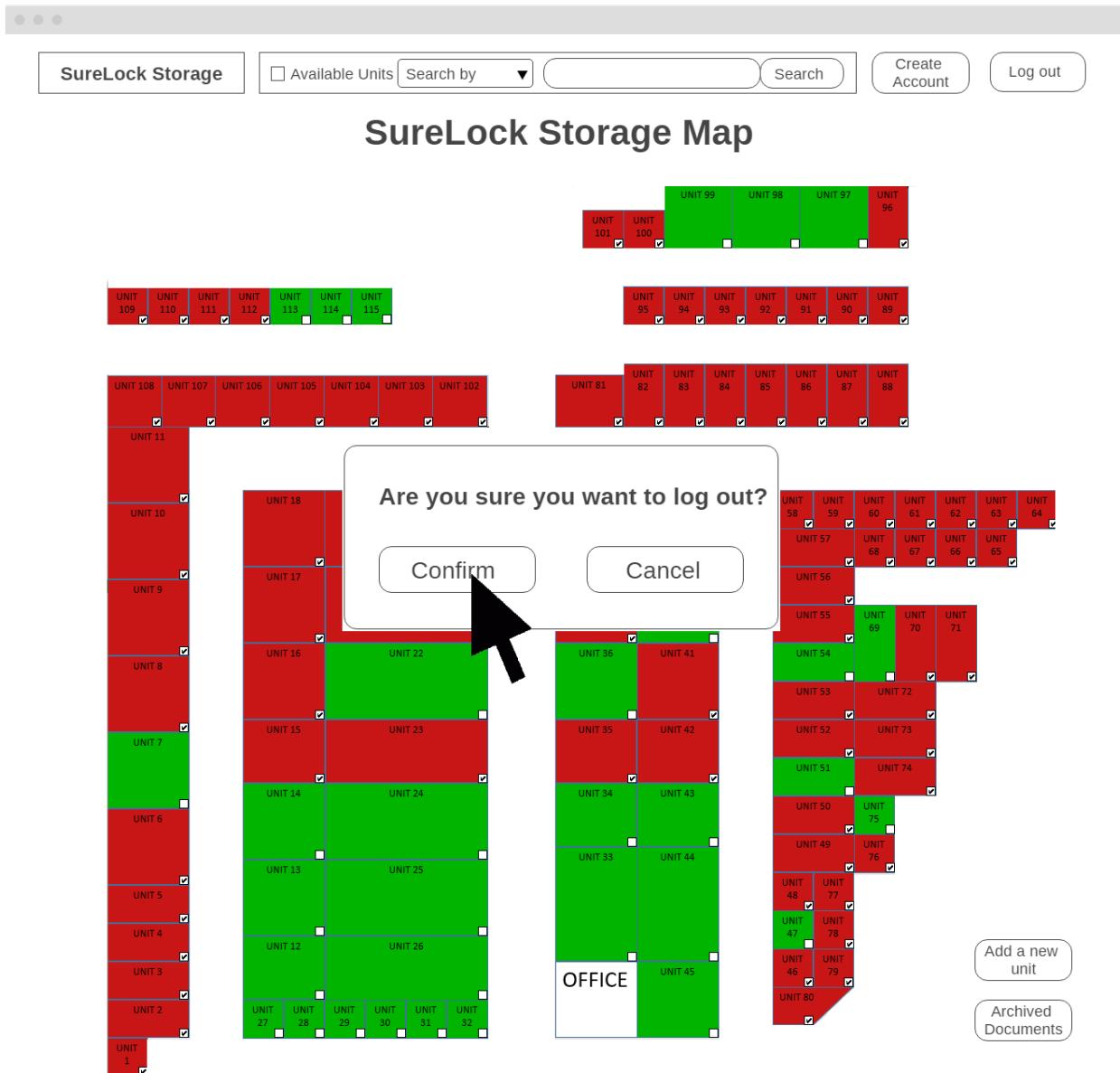


Figure 5.2: UCAM-02 UI Screen 2 – Log out Confirmation Screen

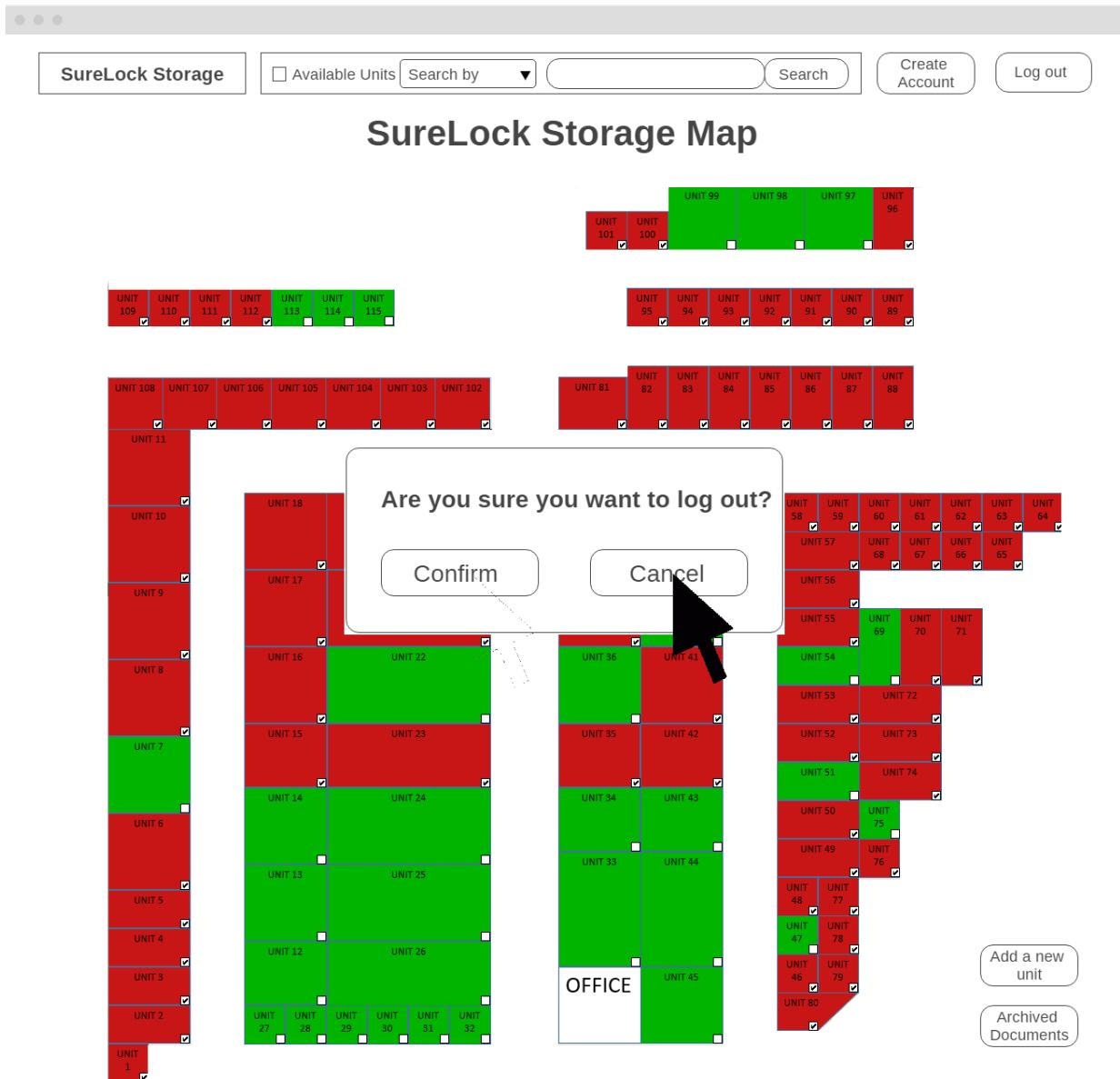


Figure 5.3: UCAM-02 UI Exception 2a: UI Screen 1 – Cancelling Log out Screen

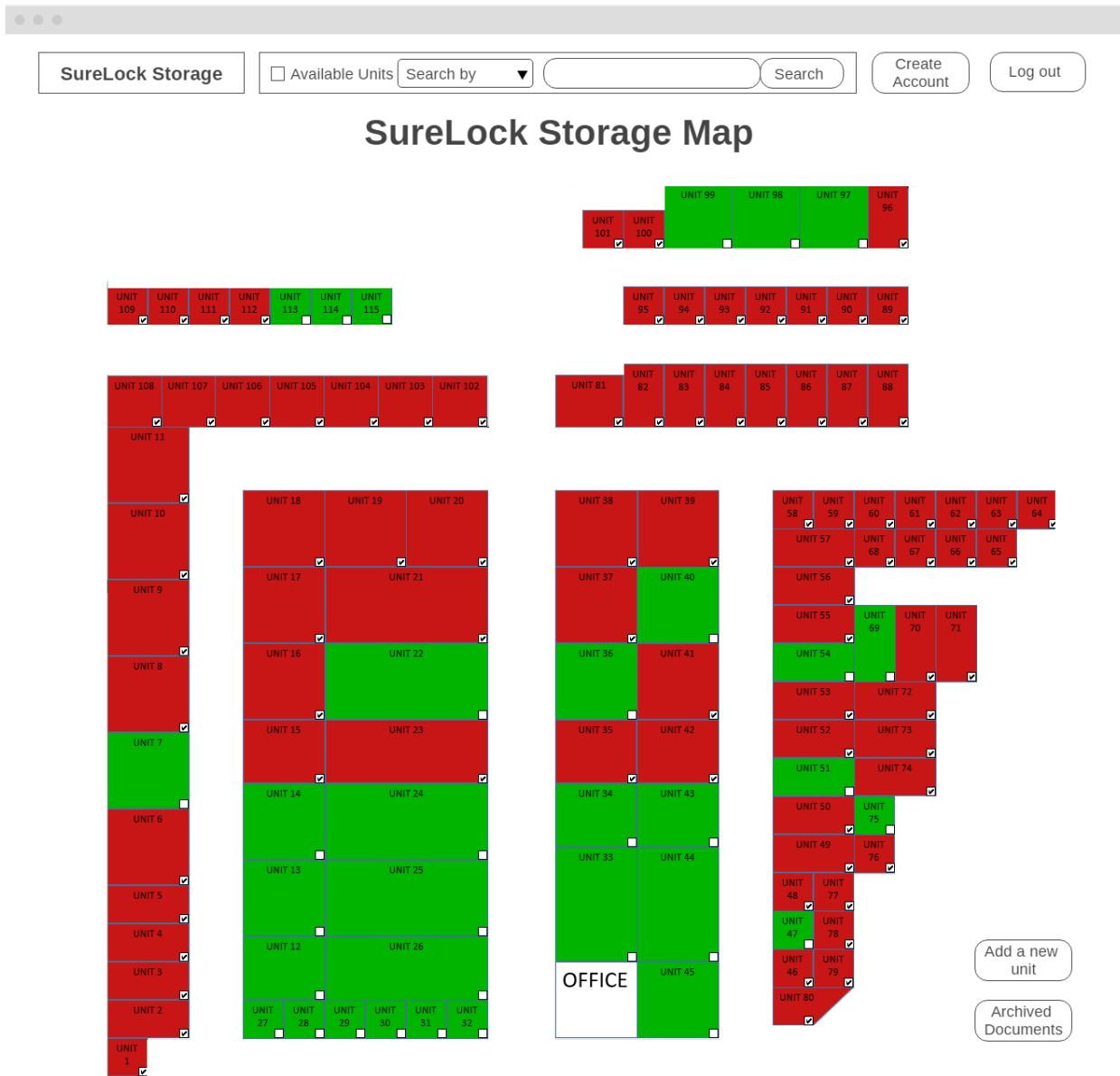


Figure 5.4: UCAM-02 UI Exception 2a: UI Screen 2 – Facility Map Screen After Cancelling

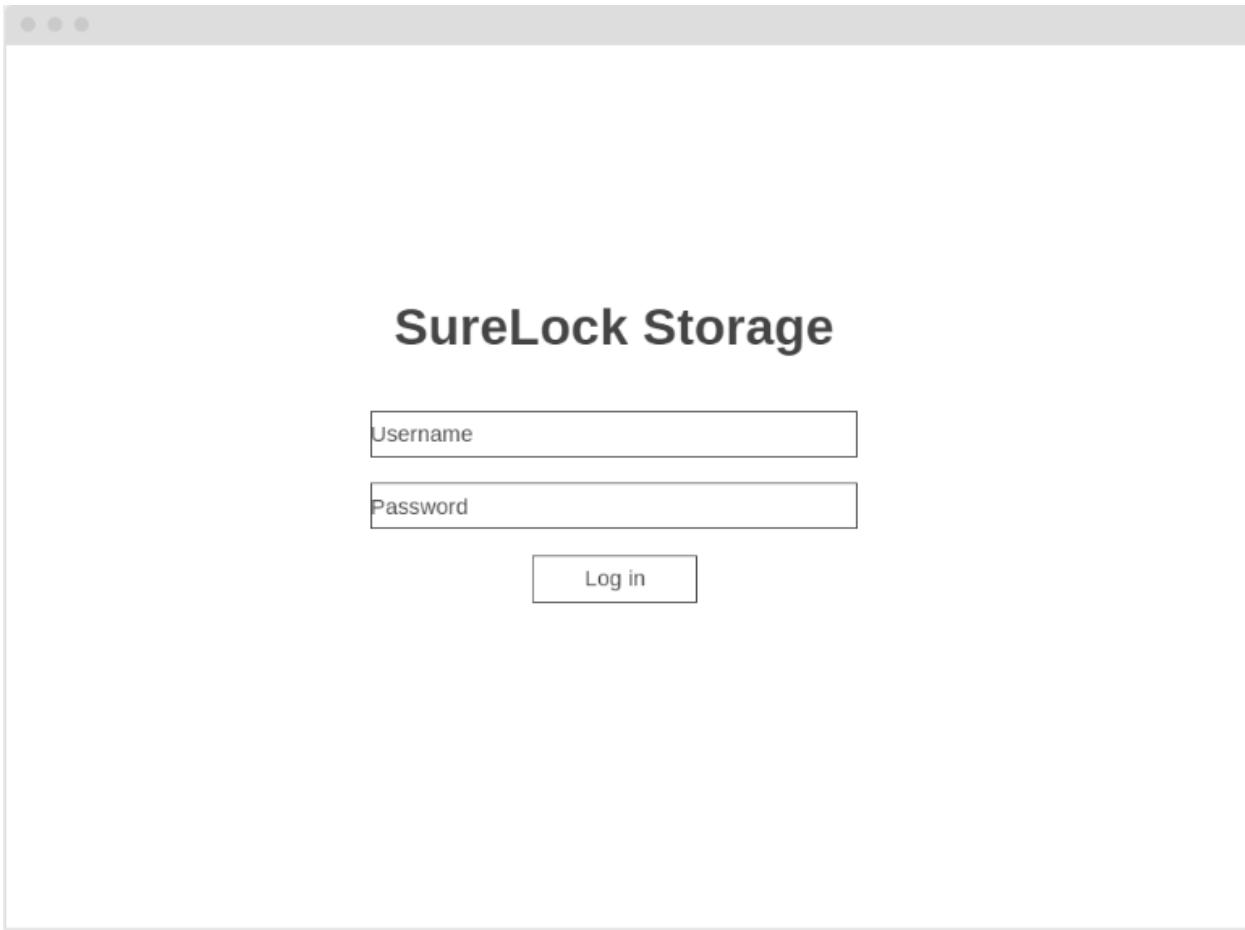


Figure 5.5: UCAM-02 UI Screen 3 – Log in Screen

The user clicks the “Log out” button. The system returns a log out confirmation pop-up box. The user clicks the “Confirm” button and the user is redirected to the log in screen.

### Use Case UCAM-03: Creating an Account

Actors: Administrators

Precondition: The user is logged into the system under an Administrator account

Steps:

1. The user selects to create account
2. The user is prompted to enter account information
3. The user enters username, password, and full name for the new account
4. The user selects the account type
5. The user submits entered information

Success Condition: The account will be created with the entered information and selected account type.

Exception: 4a) The user cancels before submitting the information. The account is not created, and the user is returned to the facility map screen. The use case ends.

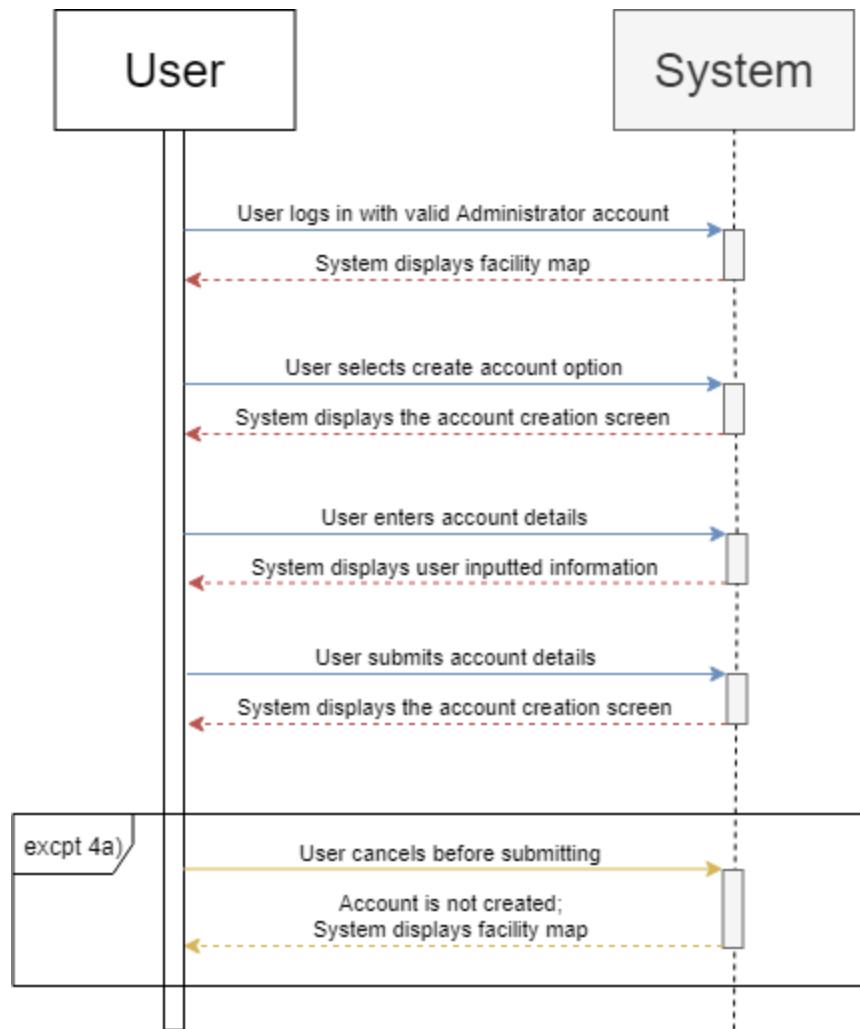


Figure 6: UCAM-03 Sequence Diagram

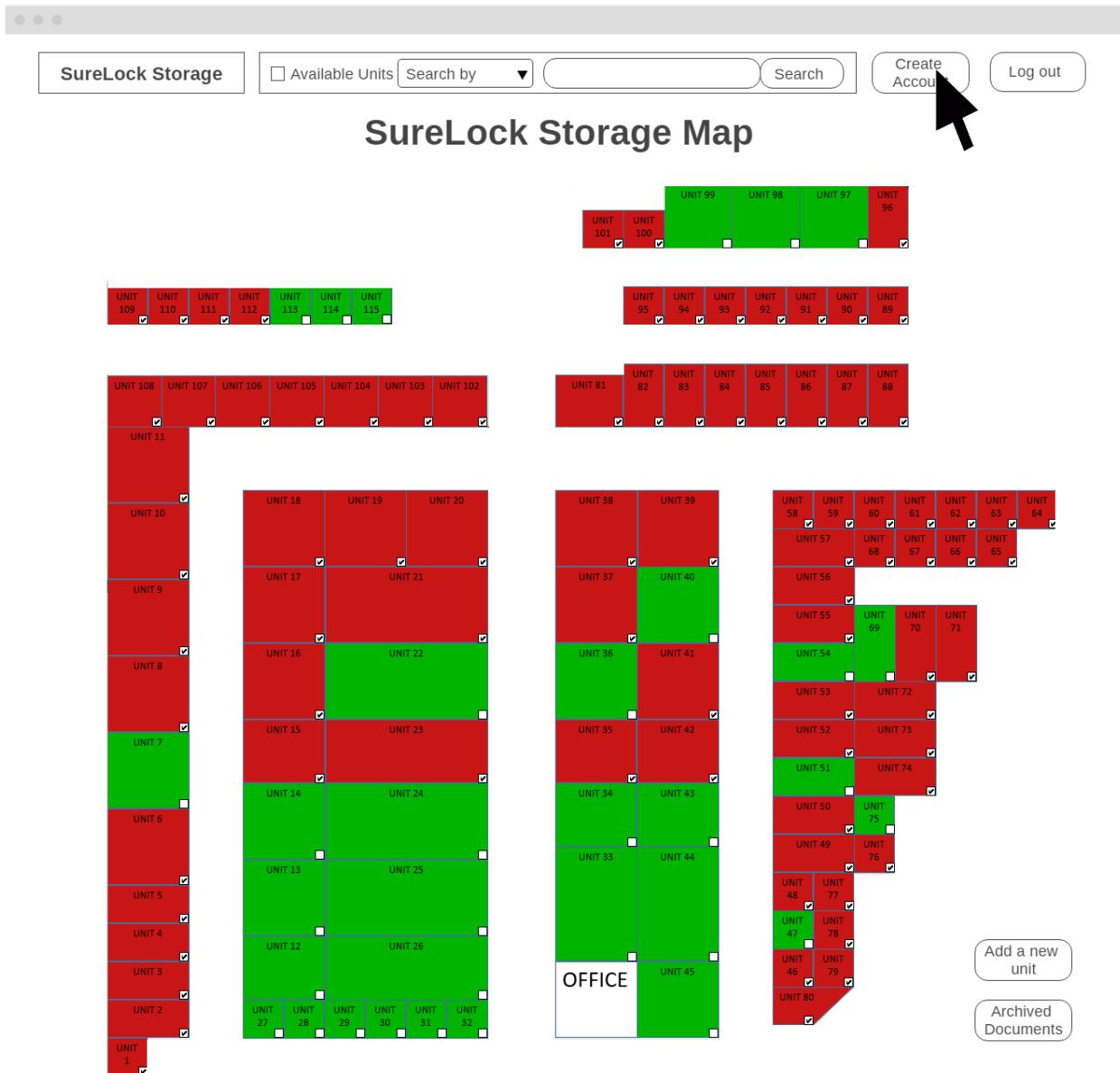


Figure 6.1: UCAM-03 UI Screen 1 – Facility Map Screen

The screenshot shows the 'Account Creation' screen. At the top left is the 'SureLock Storage' logo. In the center is the title 'Account Creation'. At the top right is a 'Log out' button. Below the title are four input fields: 'Full Name', 'Username', 'Password', and 'Confirm Password'. Underneath these is a dropdown menu labeled 'Account Type' with options 'Administrator' and 'Staff'. At the bottom are two buttons: 'Create' and 'Cancel'.

SureLock Storage

## Account Creation

Log out

Full Name

Username

Password

Confirm Password

Account Type ▾

Administrator

Staff

Create

Cancel

Figure 6.2: UCAM-03 UI Screen 2 – Account Creation Screen

The screenshot shows the 'Account Creation' screen. At the top left is the 'SureLock Storage' logo. In the center is the title 'Account Creation'. At the top right is a 'Log out' button. Below the title are four input fields: 'Full Name' containing 'Donald Trump', 'Username' containing 'DonaldTrump', 'Password' containing '\*\*\*\*\*', and 'Confirm Password' containing '\*\*\*\*\*'. Underneath these is a dropdown menu labeled 'Account Type' with the option 'Administrator' selected. At the bottom are two buttons: 'Create' and 'Cancel'. A large black cursor arrow points to the 'Create' button.

SureLock Storage

## Account Creation

Log out

Donald Trump

DonaldTrump

\*\*\*\*\*

\*\*\*\*\*

Administrator ▾

Create

Cancel

Figure 6.3: UCAM-03 UI Screen 3 – Account Creation Screen with Administrator Account Type

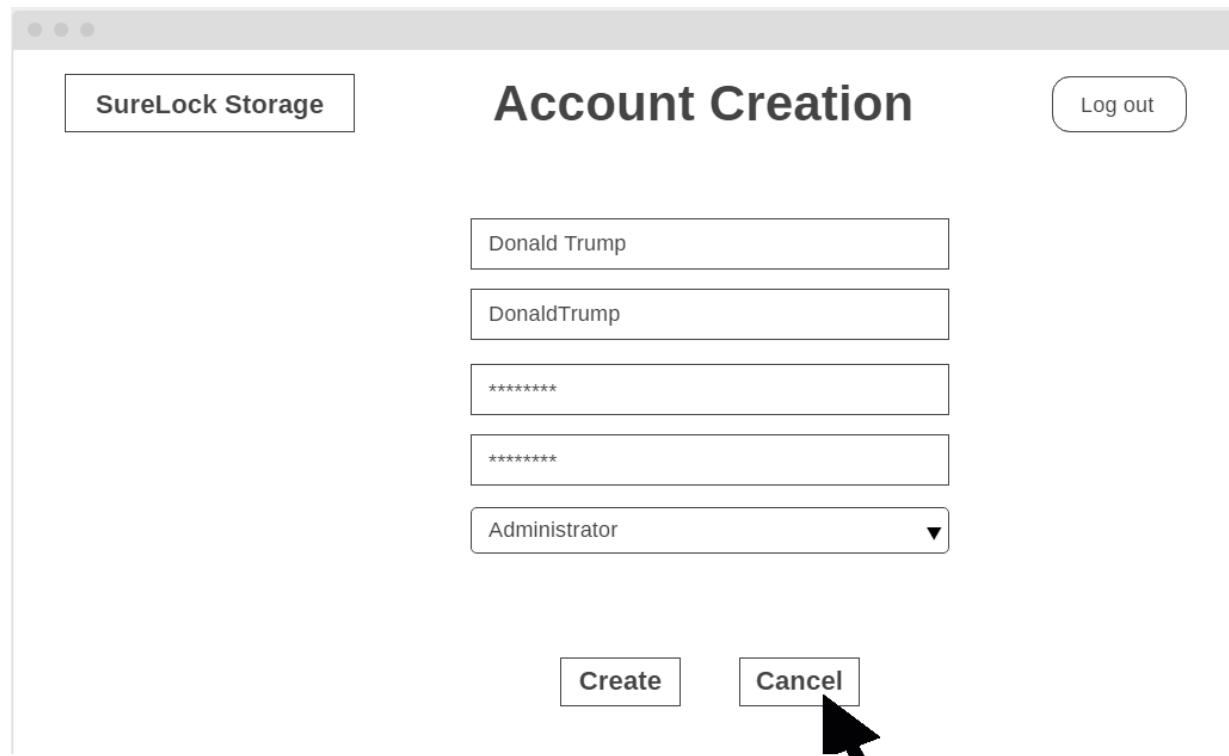
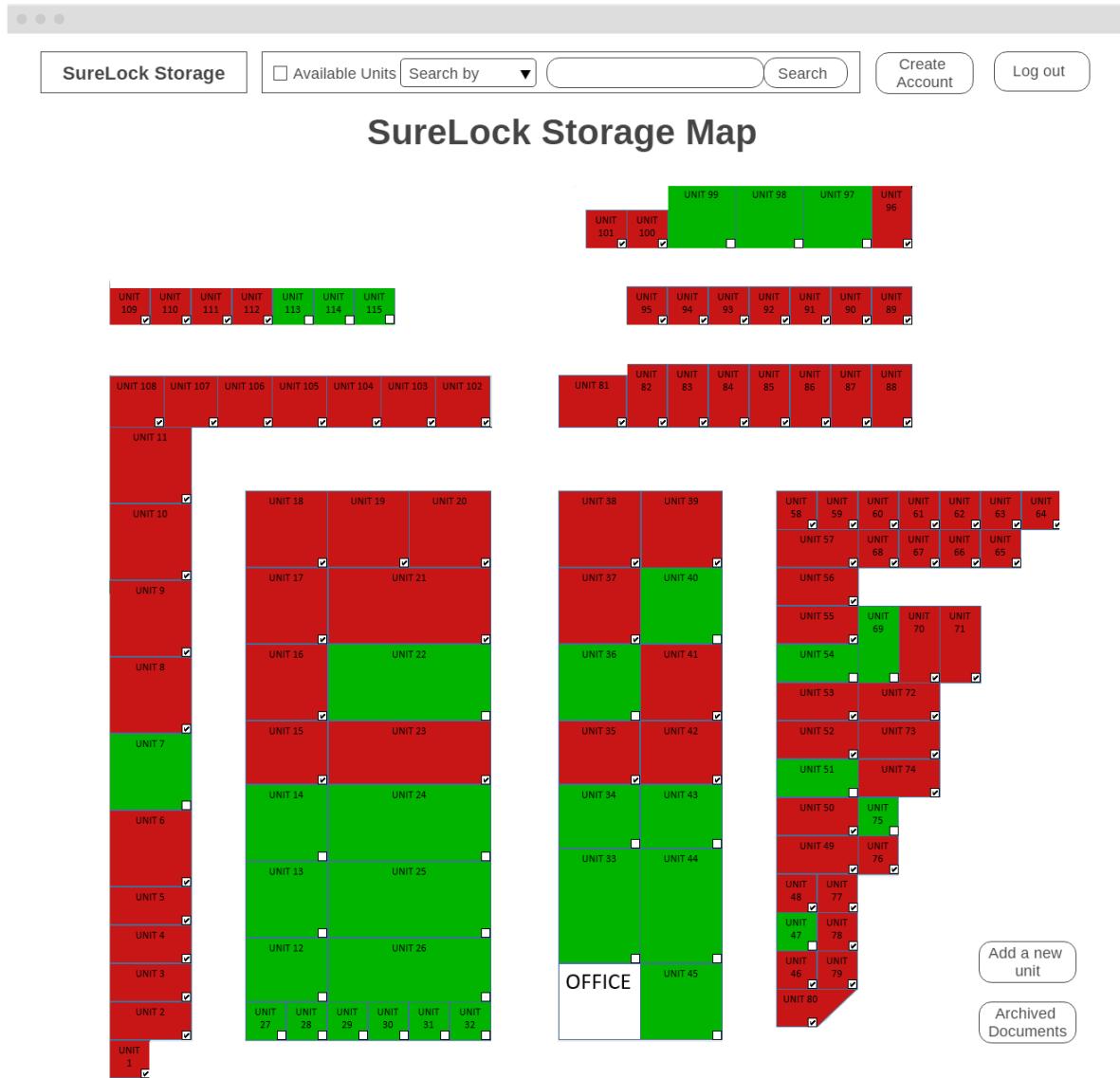


Figure 6.4: UCAM-03 Exception 4a: UI Screen 1 – Cancelling Account Creation Screen



*Figure 6.5: UCAM-03 Exception 4a: UI Screen 2 – Map Screen After the Cancelation*

The Administrator clicks “Create Account” to go to the account creation screen. The Administrator enters full name, username, password, and confirm password. The Administrator selects “Administrator” from the account type dropdown box. The Administrator clicks the “Create” button and the system creates the account.

### 7.3.2 Storage Facility Information Use Cases

#### Use Case UCSFI-01: Viewing the Storage Facility Map

Actors: Administrators and Staff Members

Precondition: A user has logged in to the system under a valid account

Steps:

1. The user views the facility map

Success Condition: The facility map is displayed to the user

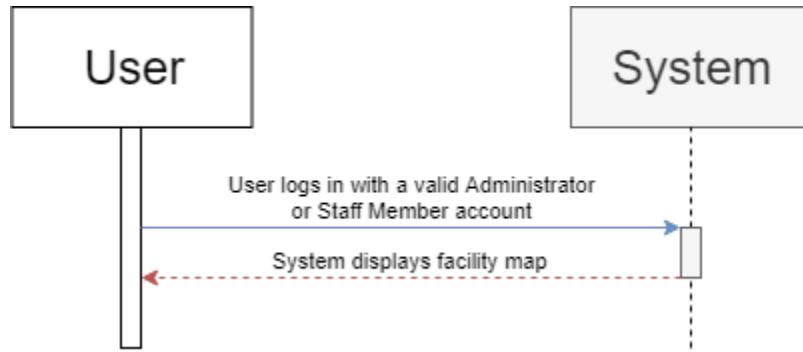
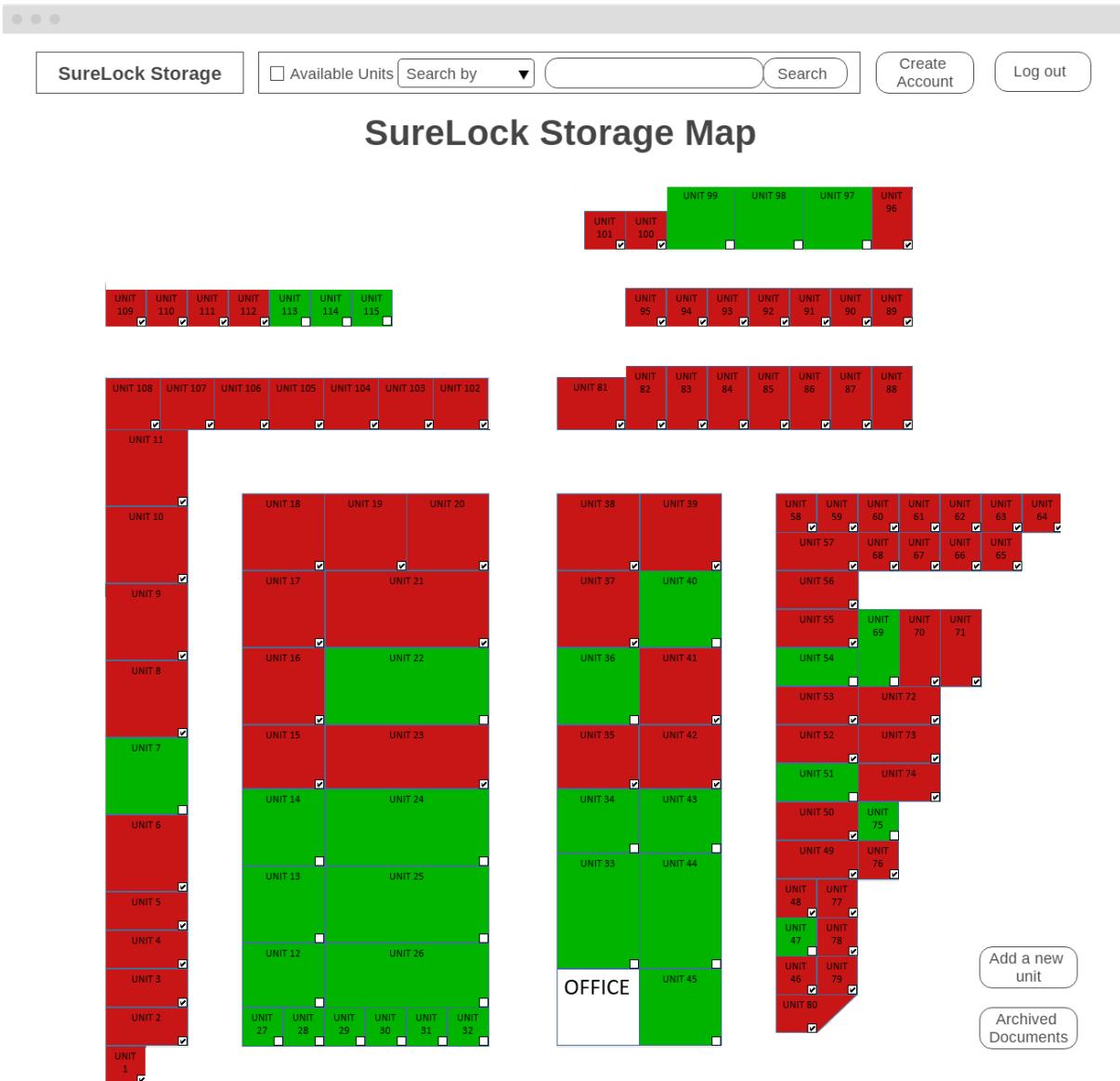


Figure 7: UCSFI-01 Sequence Diagram



*Figure 7.1: UCSFI-01 UI Screen 1 – Facility Map Screen*

The user sees the facility map with the units displayed in two different colours. Red is a not available unit, while green is an available unit.

## **Use Case UCSFI-02: Assigning a unit to a client**

## Actors: Administrators

**Precondition:** A user has logged in to the system under an Administrator account

## Steps:

1. The user selects an available unit from the facility map
  2. The user is prompted to enter client information and thus selects to edit unit information
  3. The user inputs a client full name, client phone number, client email, payment amount, and payment method
  4. The user selects to save the inputted information

Success Condition: Unit information will be updated to display the inputted information and show that the unit's availability is now 'not available'

Exception: 3a) The user cancels before submitting. The annotation is not saved to the unit information. The use case ends.

Alternate Path: 2a) The user input client full name and client phone number.

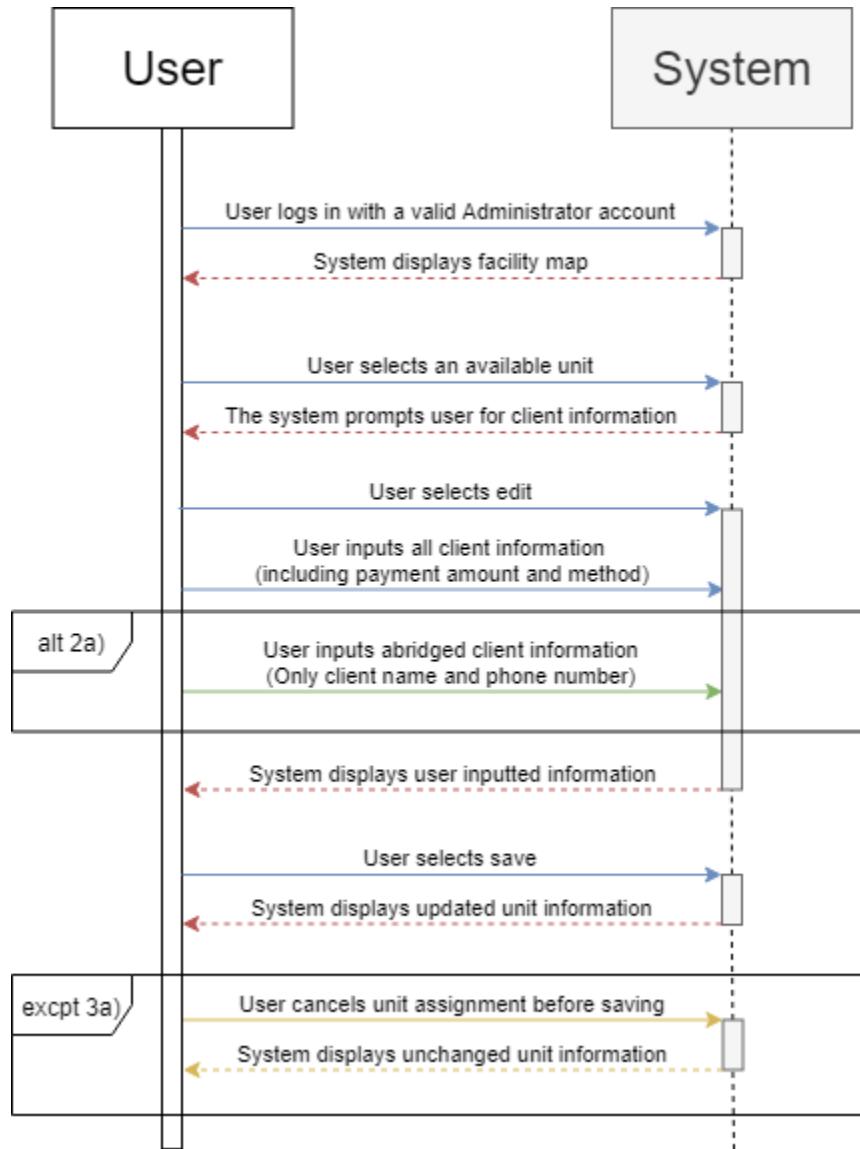


Figure 8: UCSFI-02 Sequence Diagram

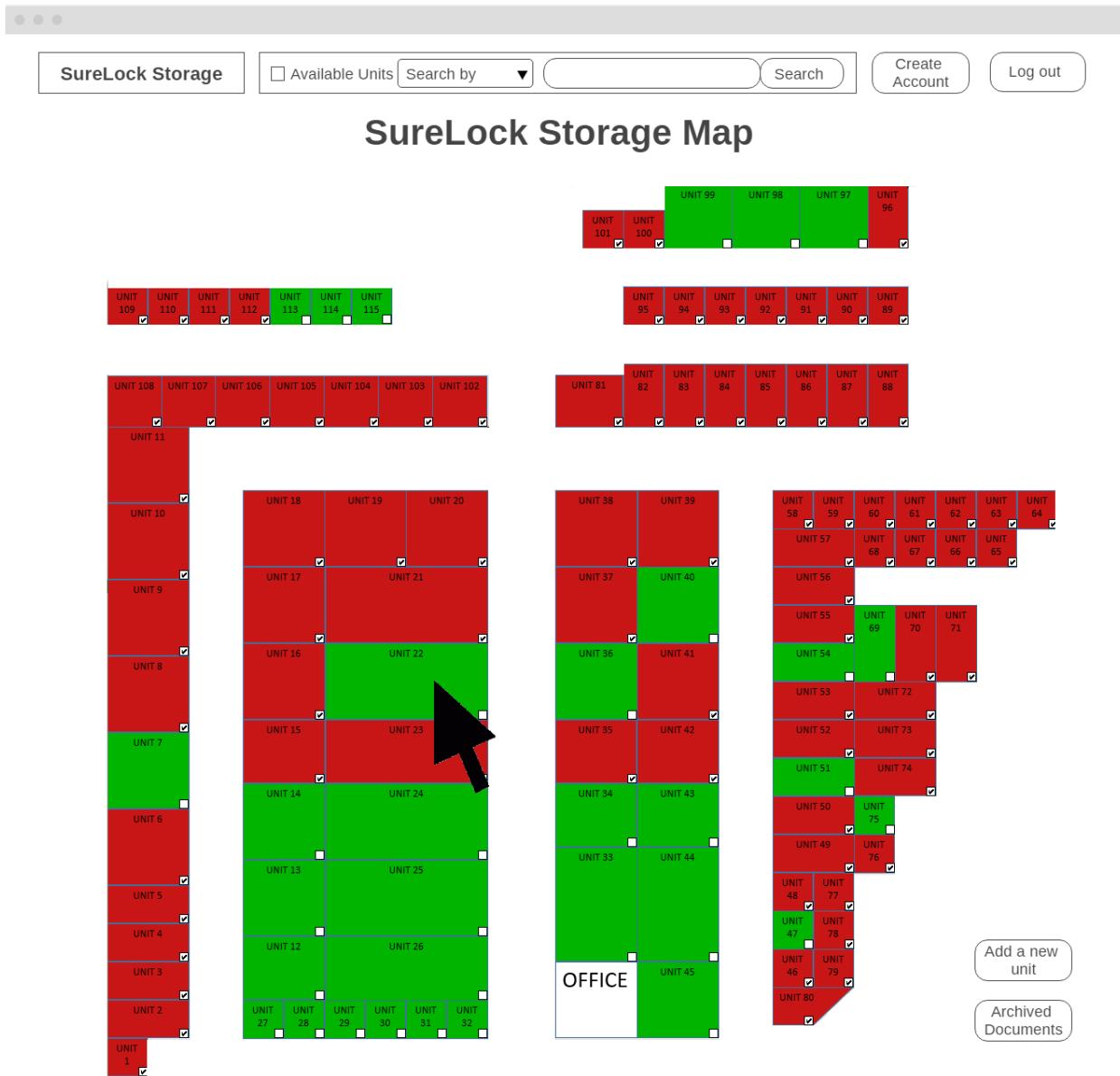


Figure 8.1: UCSFI-02 UI Screen 1 – Facility Map Screen

SureLock Storage

## Unit Information

Log out

Unit number: 22

Unit dimensions: 20'x25'x8'

Unit availability: Available

Unit rent cost: \$300 per month

Full name: -

Email: -

Phone: -

Annotation:

-

Current balance: **\$300**

Last Payment:

[See full transaction history](#)

[Transaction Document](#)

**Edit** 

**Close**

Figure 8.2: UCSFI-02 UI Screen 2 – Unit Information Screen

SureLock Storage

## Unit Information

Log out

Unit number: 22

Unit dimensions: 20'x25'x8'

Unit availability: Available

Unit rent cost: \$300 per month

Full name:

Email:

Phone:

Annotation:

Current balance: **\$300**

Remove client

Payment Amount:

Payment Method:

Last Payment:

[See full transaction history](#)

[Transaction Document](#)

**Save**

**Cancel**

Figure 8.3: UCSFI-02 UI Screen 3 – Unit Information Editing Screen

SureLock Storage

## Unit Information

Log out

Unit number: 22

Unit dimensions: 20'x25'x8'

Unit availability: Not available

Unit rent cost: \$300 per month

Full name: Dio Joester

Email:

Phone: (250) 420-6996

Current balance: \$300

Payment Amount:

Payment Method:

Last Payment:

[See full transaction history](#)

[Transaction Document](#)

Annotation:

**Save**

**Cancel**

Figure 8.4: UCSFI-02 Alternate 2a: UI Screen 1 – Unit Information Editing Screen with Full Name and Phone Number

SureLock Storage

## Unit Information

Log out

Unit number: 22

Unit dimensions: 20'x25'x8'

Unit availability: Not available

Unit rent cost: \$300 per month

Full name: Dio Joestar

Email: -

Phone: (250) 420-6996

Current balance: \$300

Last Payment:

[See full transaction history](#)

[Transaction Document](#)

Annotation: -

**Edit**

**Close**

Figure 8.5: UCSFI-02 Alternate 2a: UI Screen 2 – Unit Information Screen with Full Name and Phone Number

SureLock Storage      **Unit Information**      Log out

Unit number: 22      Remove client

Unit dimensions: 20'x25'x8'

Unit availability: Not available ▾

Unit rent cost: \$300 per month

Full name: Dio Joester

Email:

Phone: (250) 420-6996

Current balance:\$300

Payment Amount: \$300

Payment Method: Cheque

Last Payment:

See full transaction history

Transaction Document

Annotation:

**Save**      **Cancel**

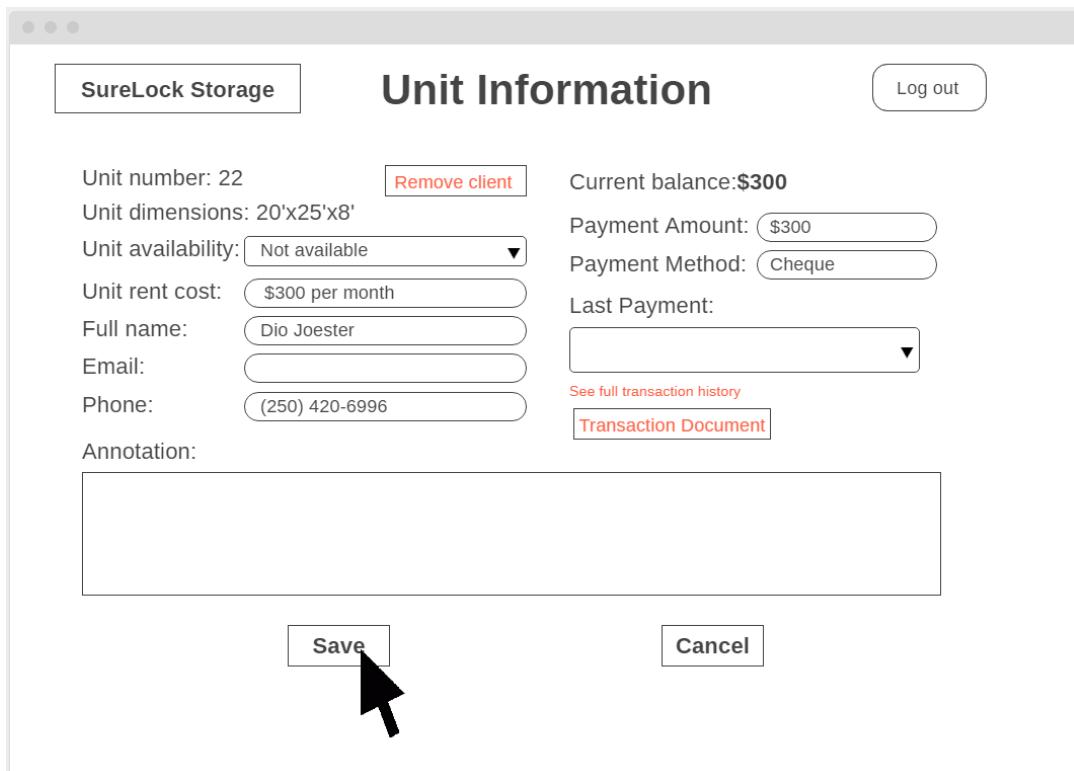


Figure 8.6: UCSFI-02 UI Screen 4 – Unit Information Editing Screen with Full Name, Phone Number, Payment Amount, and Payment Method

SureLock Storage      **Unit Information**      Log out

Unit number: 22      Remove client

Unit dimensions: 20'x25'x8'

Unit availability: Not available ▾

Unit rent cost: \$300 per month

Full name: Dio Joester

Email:

Phone: (250) 420-6996

Current balance:\$300

Payment Amount: \$300

Payment Method: Cheque

Last Payment:

See full transaction history

Transaction Document

Annotation:

**Save**      **Cancel**

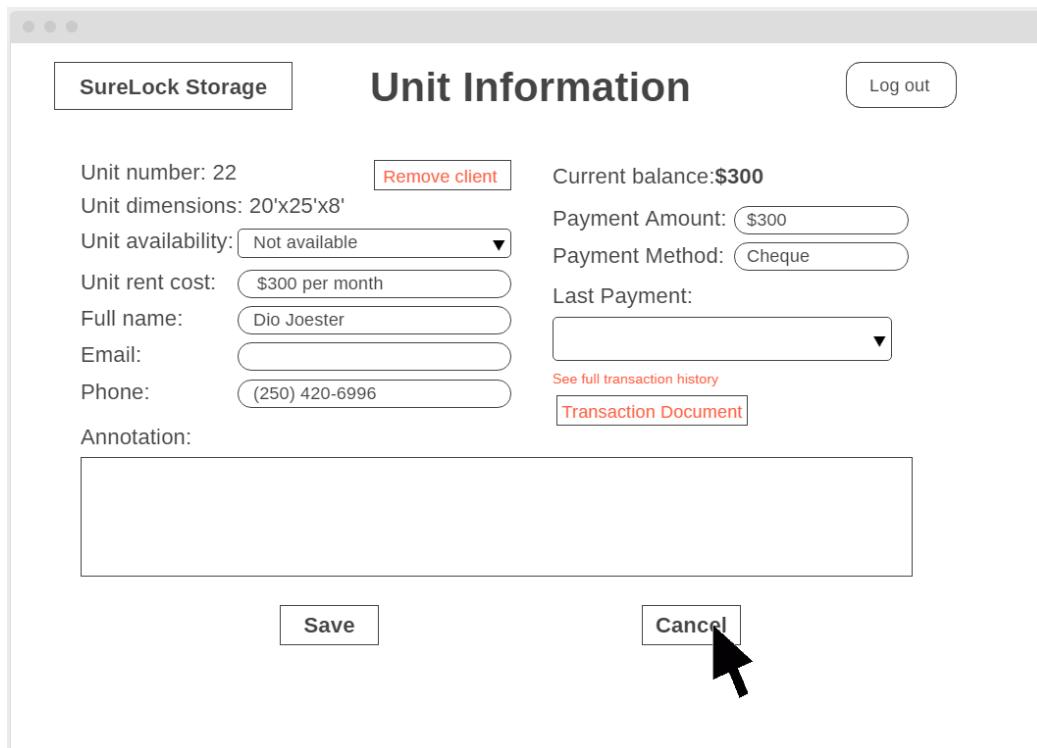


Figure 8.7: UCSFI-02 Exception 3a: UI Screen 1 – Cancelling Unit Information Editing Screen

The screenshot shows a web-based application window titled "Unit Information". In the top left corner is the logo "SureLock Storage". On the right side is a "Log out" button. The main content area displays the following information:

- Unit number: 22
- Unit dimensions: 20'x25'x8'
- Unit availability: Not available
- Unit rent cost: \$300 per month
- Full name: Dio Joestar
- Email: -
- Phone: (250) 420-6996
- Annotation: -
- Current balance: \$0
- Last Payment: Feb 2, 2019 Cheque \$300 ▾
- [See full transaction history](#)
- [Transaction Document](#)

At the bottom of the screen are two buttons: "Edit" and "Close".

Figure 8.8: UCSFI-02 UI Screen 5 – Unit Information Screen

The Administrator selects unit 22 from the facility map. The Administrator enters the view mode of the unit information. The Administrator selects “Edit” button to enter the edit mode of the unit information. In the edit mode, the Administrator inputs client’s full name, client’s phone number, payment method, and payment amount. The Administrator clicks the “Save” button to save the changes.

### Use Case UCSFI-03: Checking the availability of a unit

Actors: Administrators and Staff Members

Precondition: The user is logged in to the system under a valid account

Steps:

1. The user finds and selects the desired unit on the facility map
2. The unit’s availability will be displayed in the unit information

Success Condition: The user has successfully checked the unit’s availability.

Alternate Path: 1a) The user cannot find the unit on the facility map. Then, the user can use the system searching feature to find the unit’s location. If the unit exists in the system, the user can then access the unit’s information, and therefore its availability, directly from the search feature.

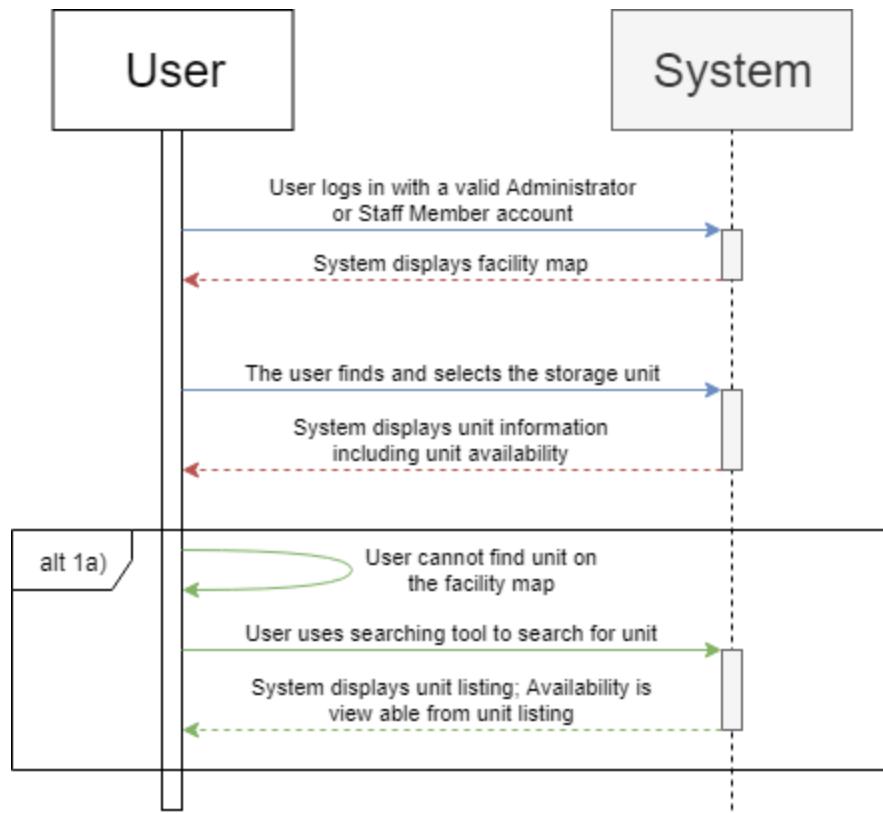


Figure 9: UCSFI-03 Sequence Diagram

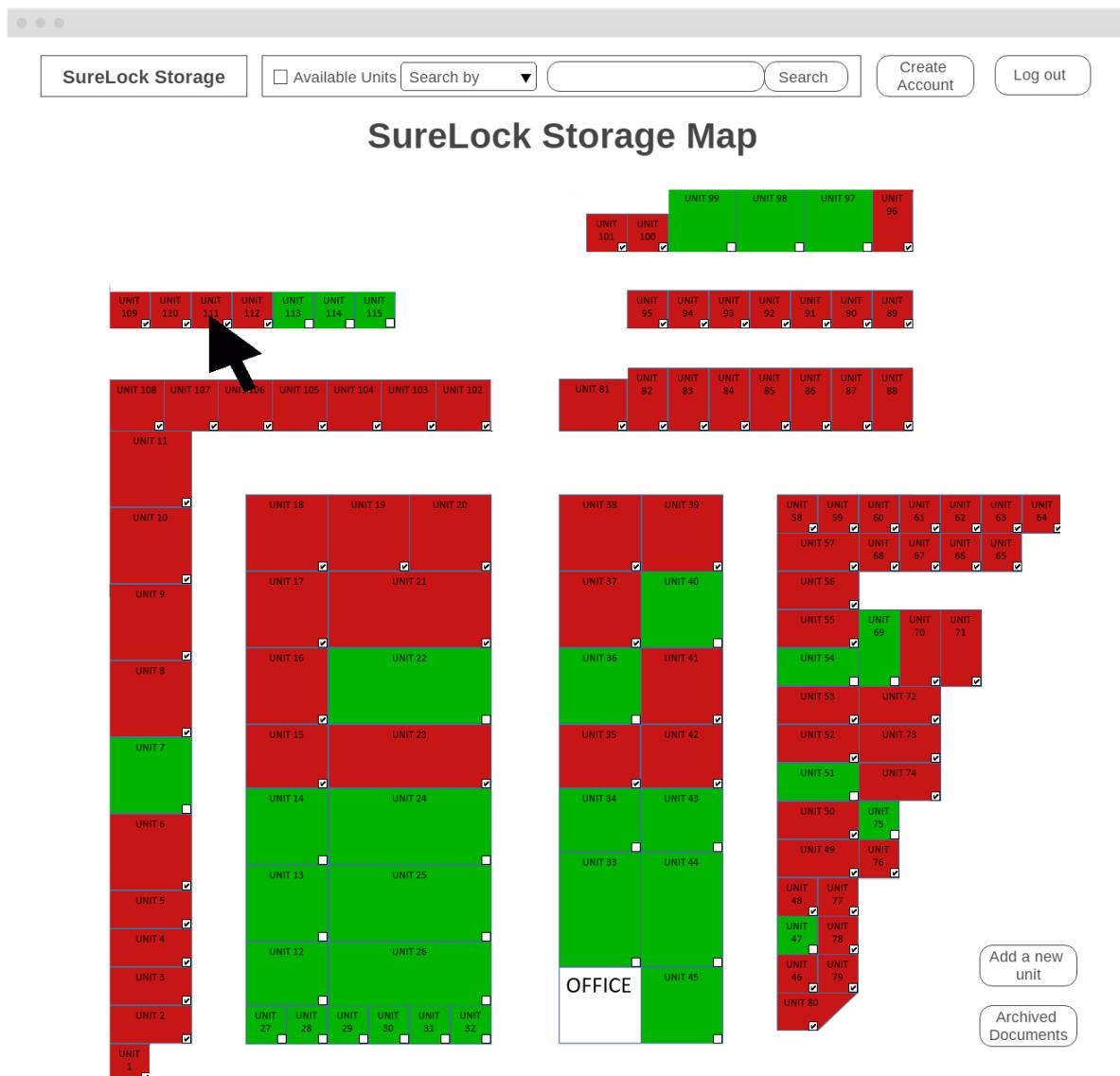


Figure 9.1: UCSFI-03 UI Screen 1 – Map Screen

**SureLock Storage**      **Unit Information**      [Log out](#)

|                                  |  |
|----------------------------------|--|
| Unit number: 111                 | Current balance: <b>\$660</b>                              |
| Unit dimensions: 5'x5'x8'        | Last Payment:  |
| Unit availability: Not available | <a href="#">Feb 26, 2019</a> Credit <a href="#">\$50 ▾</a> |
| Unit rent cost: \$110 per month  | <a href="#">See full transaction history</a>               |
| Full name: Donald Trump          | <a href="#">Transaction Document</a>                       |
| Email: donaldtrump@gmail.com     |  |
| Phone: (250) 911-1234            |  |
| Annotation:                      |  |
| Also renting unit 23             |  |

[Edit](#)      [Close](#)

*Figure 9.2: UCSFI-03 UI Screen 2 – Unit Information Screen*

The user selects unit 111 from the facility map. The Administrator is directed to the view mode of the unit information. The user sees the unit availability is set as “Not available”.

#### **Use Case UCSFI-04: Adding a new storage unit in the facility**

Actors: Administrators

Precondition: The user is logged into the system with an Administrator account.

Steps:

1. The user selects add new storage unit
2. A unit creation view is displayed to the user
3. The user inputs the unit number, unit dimensions, and cost to rent the new storage unit, then selects to confirm creation
4. The user is prompted to select a location for the new unit
5. The user selects a location on the facility map for the new unit
6. The user selects to save

Success Condition: The new storage unit is created and displayed at the selected location with its unit availability set to ‘available’

Exceptions:

- 3a) The user cancels before submitting unit number, unit dimensions, and unit rent cost. The storage unit is not added to the facility map. The use case ends.
- 3b) The user submits with a unit number that is already in use. The system displays an error message informing the user and does not proceed to the facility map. The use case ends.

- 4a) The user cancels before submitting a selected location. The storage unit is not added to the facility map. The use case ends.

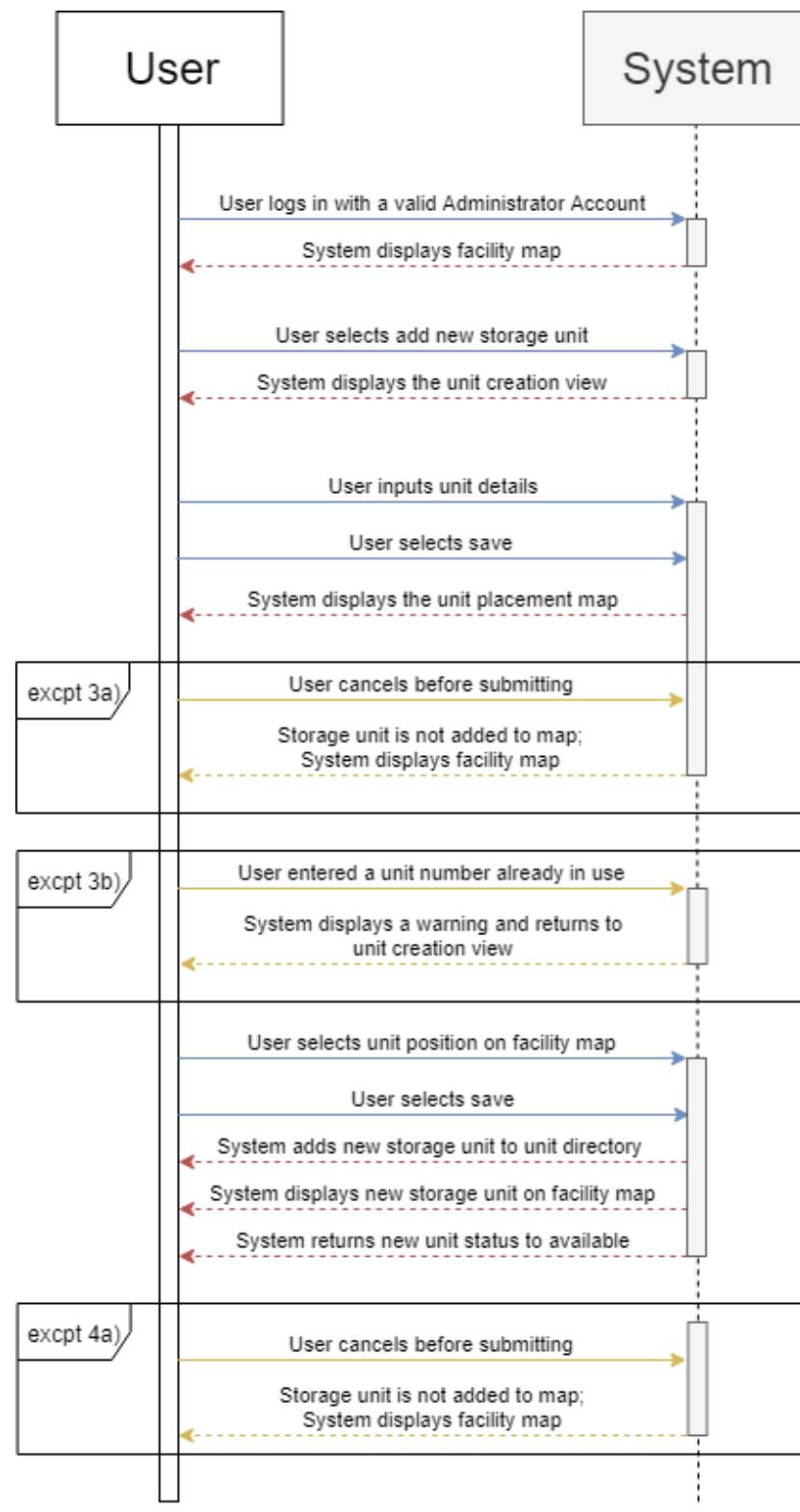


Figure 10: UCSFI-04 Sequence Diagram



Figure 10.1: UCSFI-04 UI Screen 1 – Facility Map Screen

SureLock Storage

## Add Unit

Log out

Unit Number  
111

Unit Dimensions  
5x5x8'

Unit Rent Cost  
\$200 per month

Create

Cancel

Figure 10.2: UCSFI-04 UI Screen 2 – Add Unit Screen

SureLock Storage

## Add Unit

Log out

Unit Number  
111

Unit Dimensions  
5x5x8'

Unit Rent Cost  
\$200 per month

Create

Cancel

Figure 10.3: UCSFI-04 Exception 3b: UI Screen 1 – Add Unit Screen with Existing Unit Number

The screenshot shows a web-based application window titled "Add Unit". In the top left corner is the "SureLock Storage" logo. On the right side is a "Log out" button. The main content area has three input fields. The first field contains the value "111" and displays a red error message below it: "This unit is already in use.". The second field contains the value "5'x5'x8'". The third field contains the value "\$200 per month". At the bottom of the form are two buttons: "Create" on the left and "Cancel" on the right.

Figure 10.4: UCSFI-04 Exception 3b: UI Screen 2 – Add Unit Screen with Existing Unit Number Message

This screenshot is identical to Figure 10.4, showing the "Add Unit" screen with the same input fields and button layout. The difference is that the "Create" button now has a large black cursor arrow pointing directly at it, indicating the user's intention to click the button to submit the form.

Figure 10.5: UCSFI-04 UI Screen 3 – Add Unit Screen with Unit Number, Unit Dimension and Unit Rent Cost

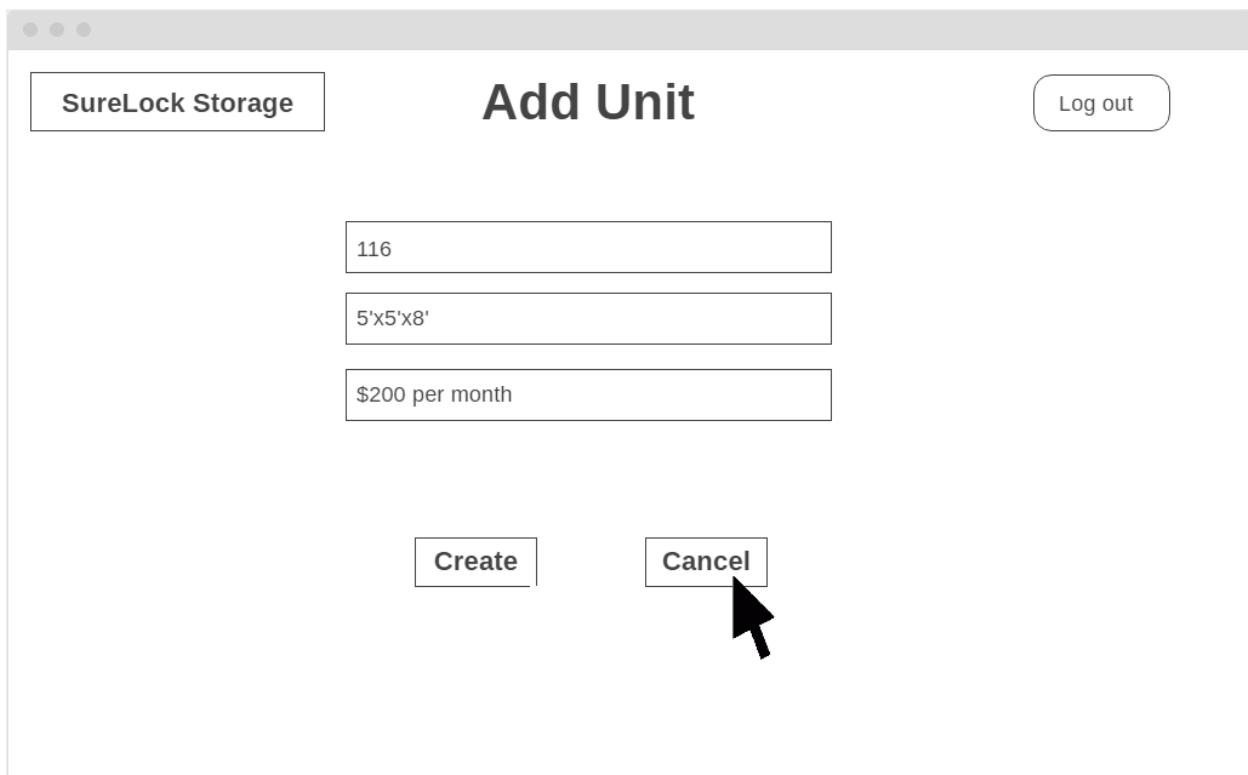


Figure 10.6: UCSFI-04 UI Exception 3a: UI Screen 1 – Cancelling Add Unit Screen

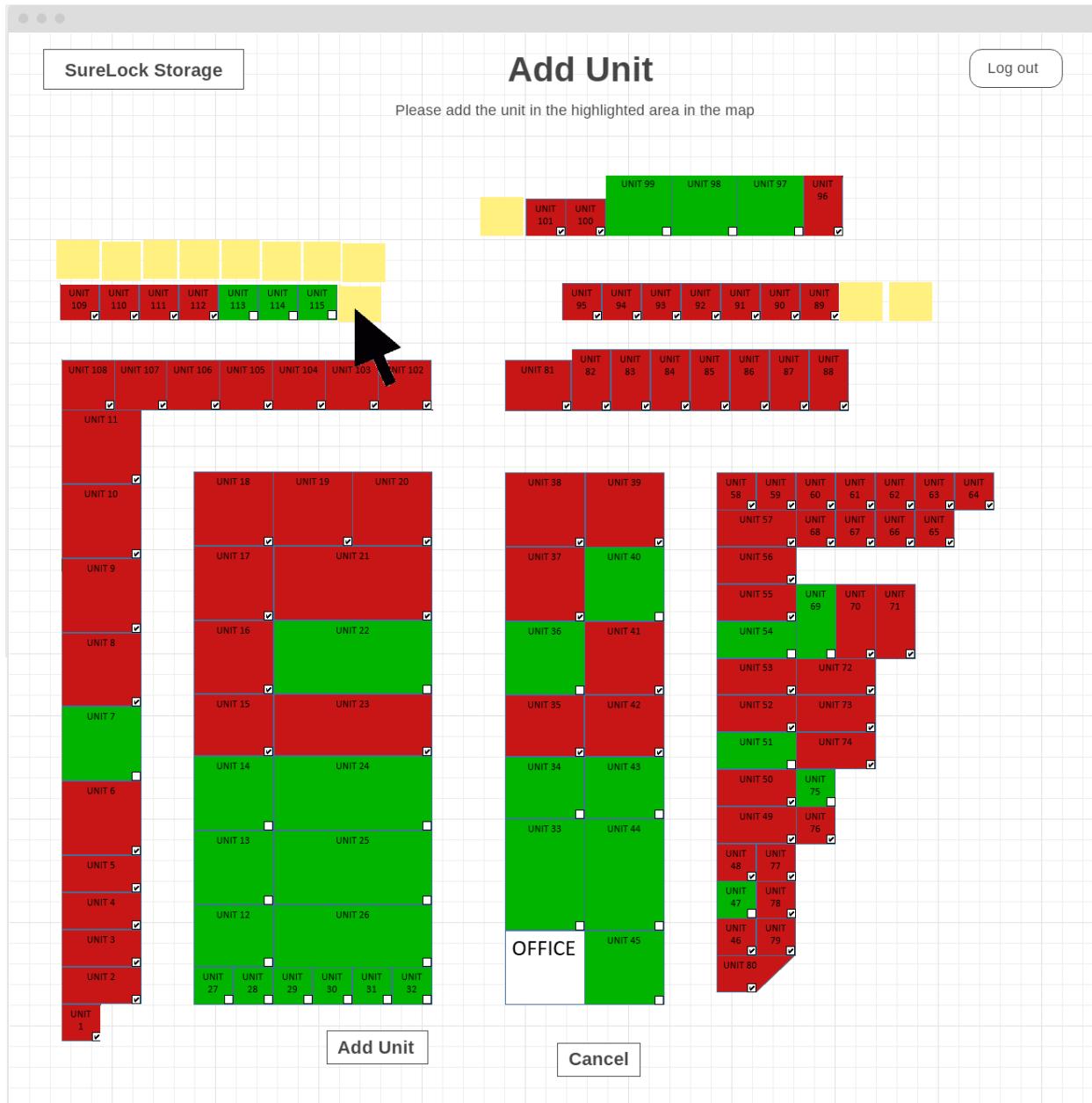


Figure 10.7: UCSFI-04 UI Screen 4 – Add Unit Interactive Facility Map Screen

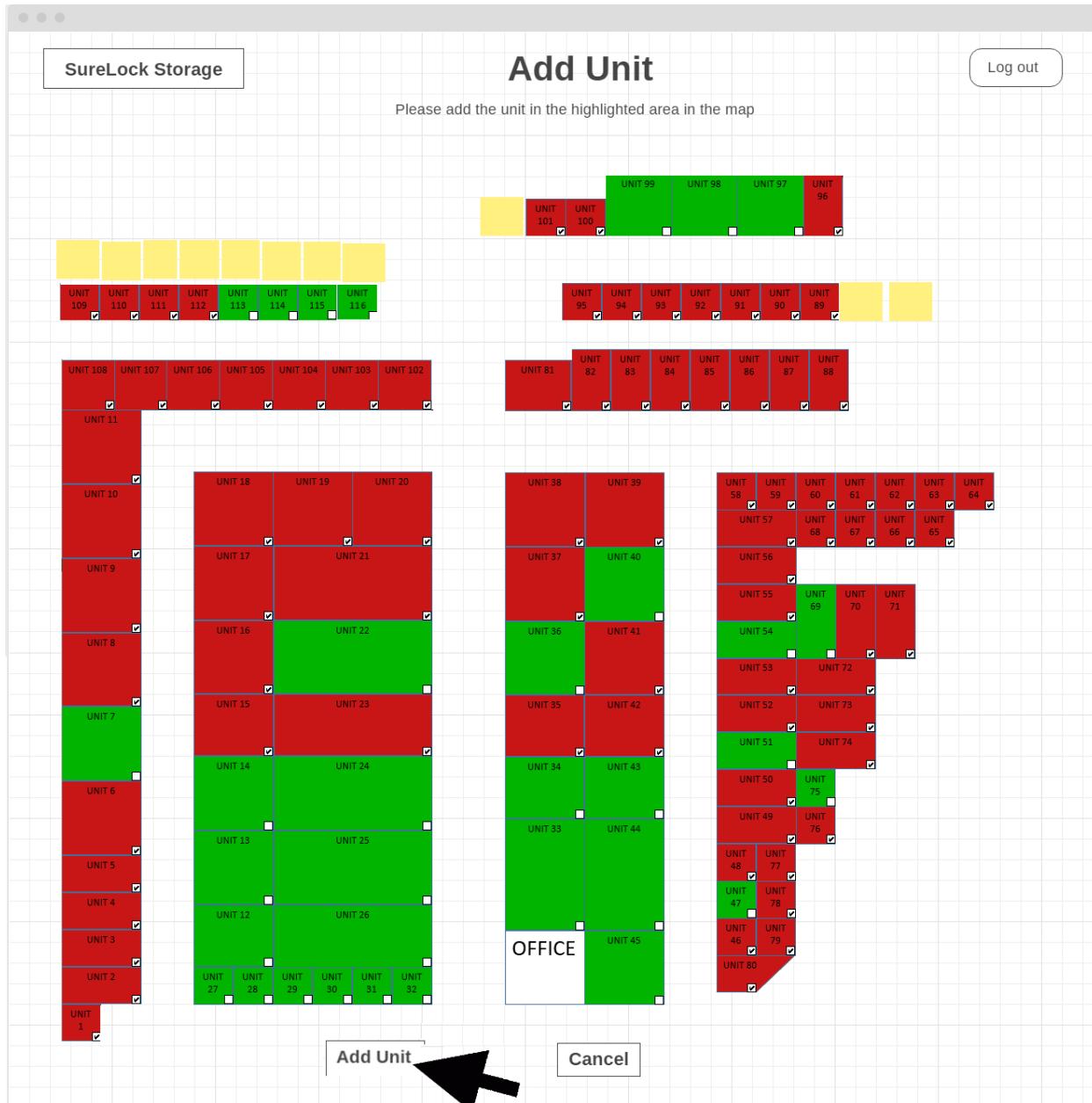


Figure 10.8: UCSFI-04 UI Screen 5 – Add Unit Interactive Facility Map Screen with Unit 116

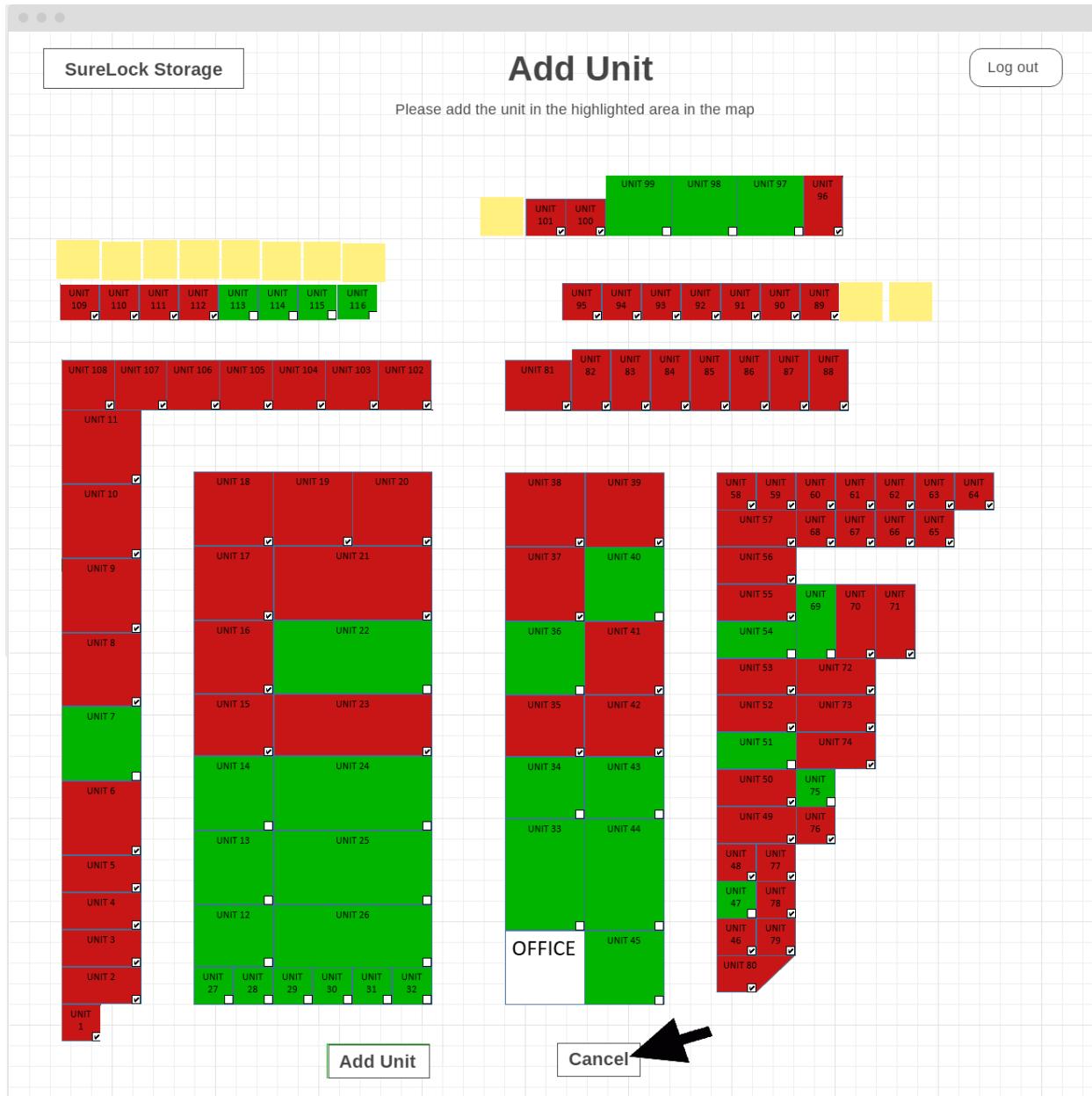


Figure 10.9: UCSFI-04 Exception 4a: UI Screen 1 – Cancelling Add Unit Interactive Facility Map Screen with Unit 116

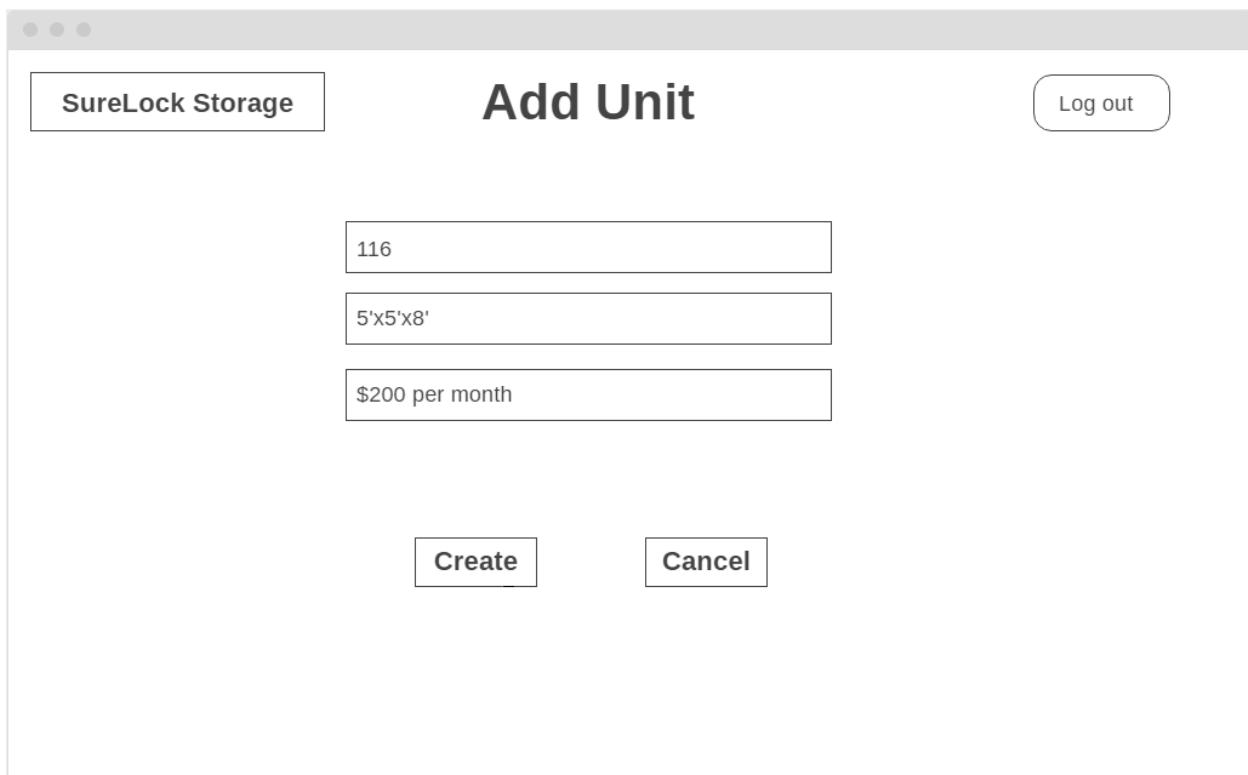


Figure 10.10: UCSFI-04 Exception 4a: UI Screen 2 – Cancelled Add Unit Screen

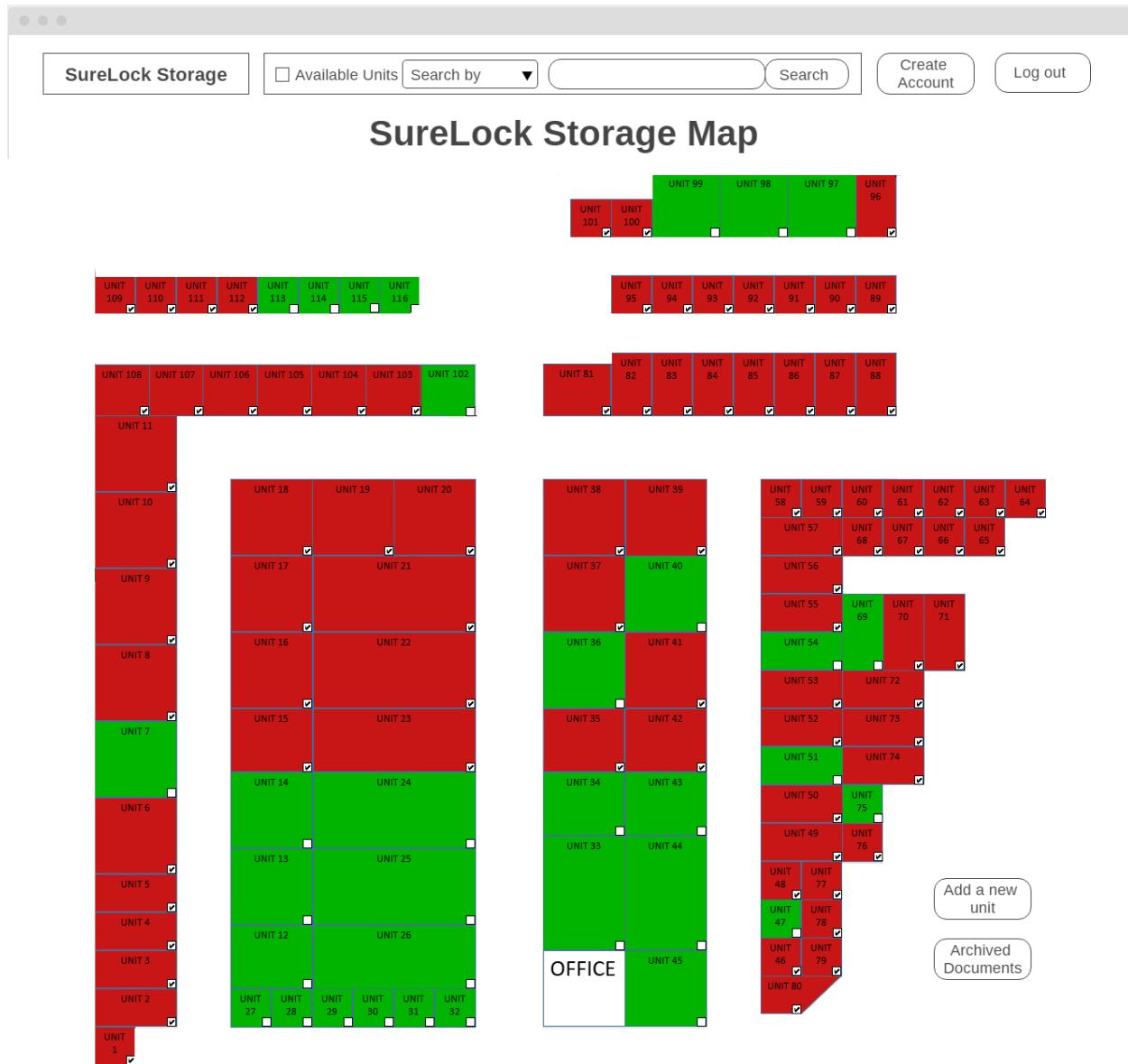


Figure 10.11: UCSFI-04 UI Screen 5 – Facility Map Screen with Unit 116

The Administrator clicks “Add a new unit” and is directed to add unit screen. The Administrator enters a unit number, unit dimension, and unit rent cost. The Administrator clicks the “Create” button to create the unit and the Administrator is directed to the add unit interactive facility map screen. The Administrator selects the highlighted box to add the unit on to the interactive facility map. The Administrator clicks the “Add Unit” button to confirm the addition of the new unit in the facility map. The Administrator is directed to the facility map screen with the new unit added.

## **Use Case UCSFI-05: Removing client from unit**

Actors: Administrators

Preconditions:

- The user is logged into the system with an Administrator account
- There exists a unit with an associated client

Steps:

1. The user selects a unit which is 'not available'
2. The unit information is displayed
3. The user selects edit
4. The user selects to remove client from unit
5. The user is prompted to confirm their selection
6. The user confirms intent to remove client from unit
7. The user selects to save the edits

Success Condition: The system removes all client information from the unit and sets the unit to 'available'. Removed transaction documents will be archived.

Exception:

- 5a) The user cancels the confirmation. The client is not removed. The use case ends.
- 6a) The user cancels before submitting. The client is not removed. The use case ends.

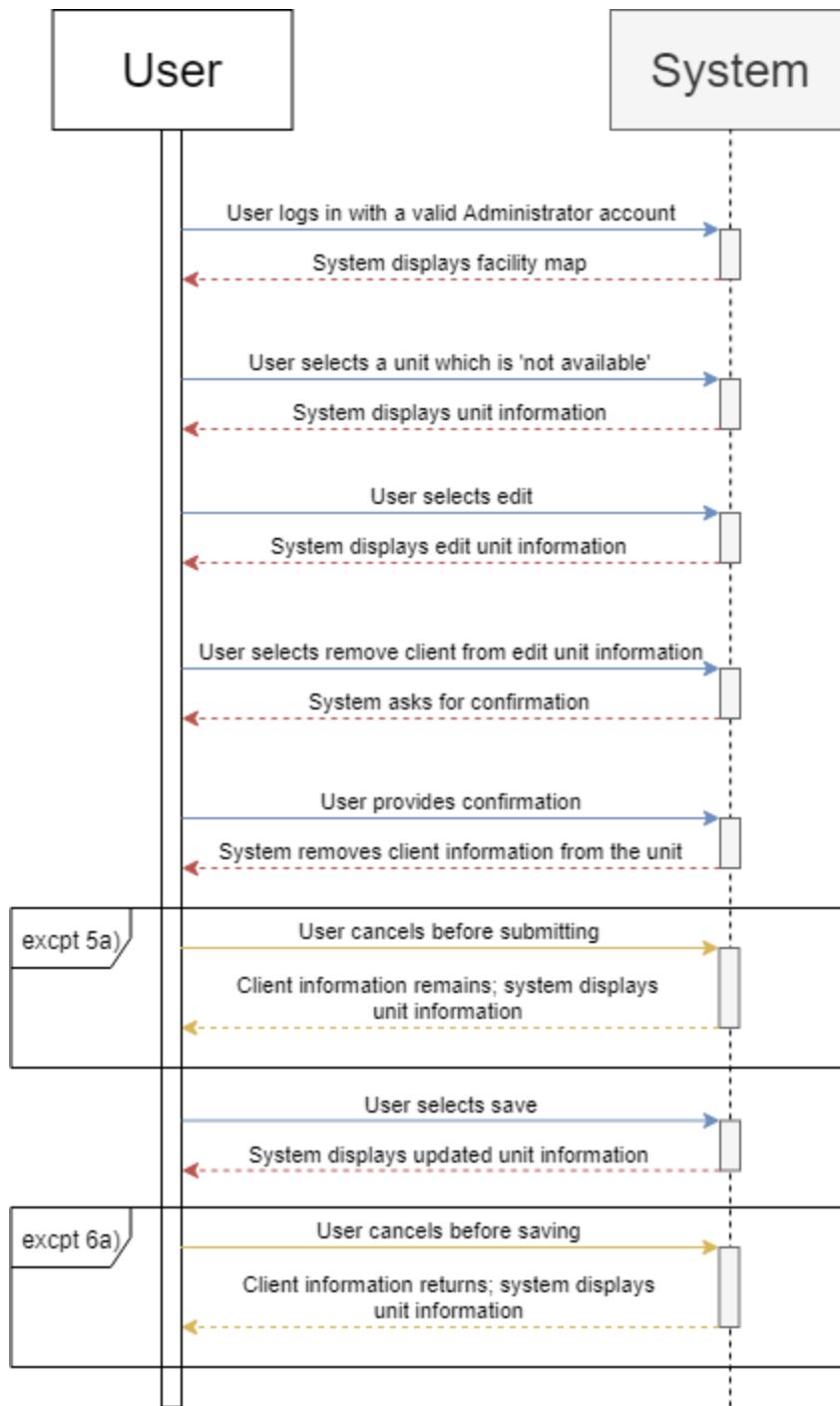


Figure 11: UCSFI-05 Sequence Diagram



*Figure 11.1: UCSFI-05 UI Screen 1 – Facility Map Screen*

SureLock Storage

## Unit Information

Log out

Unit number: 102

Unit dimensions: 10'x10'x8'

Unit availability: Not available

Unit rent cost: \$190 per month

Full name: Joseph Brando

Email: zawarudo@gmail.com

Phone: (250) 223-6969

Annotation:

Paid

Current balance:\$0

Last Payment:

Feb 26, 2019 Credit \$50 ▾

[See full transaction history](#)

[Transaction Document](#)

Edit

Close

Figure 11.2: UCSFI-05 UI Screen 2 – Unit Information Screen

SureLock Storage

## Unit Information

Log out

Unit number: 102

Unit dimensions: 10'x10'x8'

Unit availability: Not available ▾

Unit rent cost: \$190 per month

Full name: Joseph Brando

Email: zawarudo@gmail.com

Phone: (250) 223-6969

Annotation:

Paid

Current balance:\$0

Payment Amount:

Payment Method:

Last Payment:

Feb 26, 2019 Credit \$50 ▾

[See full transaction history](#)

[Transaction Document](#)

Remove client

Save

Cancel

Figure 11.3: UCSFI-05 UI Screen 3 – Unit Information Editing Screen

SureLock Storage      **Unit Information**      Log out

Unit number: 102      Remove client      Current balance:\$0  
Unit dimensions: 10'x10'x8'  
Unit availability: Not available      Payment Amount:  
Unit rent cost: \$50      Payment Methods:  
Full name: Joseph Brando  
Email: zbrando@ucsf.edu  
Phone: (209) 555-1234  
Annotation: Paid

**Do you want to remove Joseph Brando from Unit 102?**

**Confirm**      **Cancel**

Save      Cancel

Figure 11.4: UCSFI-05 UI Screen 4 – Remove Client Confirmation Screen

SureLock Storage      **Unit Information**      Log out

Unit number: 102      Remove client      Current balance:\$0  
Unit dimensions: 10'x10'x8'  
Unit availability: Not available      Payment Amount:  
Unit rent cost: \$50      Payment Methods:  
Full name: Joseph Brando  
Email: zbrando@ucsf.edu  
Phone: (209) 555-1234  
Annotation: Paid

**Do you want to remove Joseph Brando from Unit 102?**

**Confirm**      **Cancel**

Save      Cancel

Figure 11.5: UCSFI-05 UI Exception 5a: UI Screen 1 – Canceling Remove Client Confirmation Screen

SureLock Storage      **Unit Information**      Log out

|   |  |                     |
|---|--|---------------------|
| Unit number: 102  | <a href="#">Remove client</a>                | Current balance:\$0 |
| Unit dimensions: 10'x10'x8'   | Payment Amount: <input type="text"/>         |                     |
| Unit availability: Not available  | Payment Method: <input type="text"/>         |                     |
| Unit rent cost: \$190 per month   | Last Payment:                                |                     |
| Full name: Joseph Brando  | Feb 26, 2019 Credit \$50 ▾                   |                     |
| Email: zawarudo@gmail.com   | <a href="#">See full transaction history</a> |                     |
| Phone: (250) 223-6969   | <a href="#">Transaction Document</a>         |                     |
| Annotation:<br><div style="border: 1px solid black; height: 80px; padding: 5px;">Paid</div> |  |                     |
| <a href="#">Save</a> <a href="#">Cancel</a>   |  |                     |

Figure 11.6: UCSFI-05 UI Exception 5a: UI Screen 2 – Remove Client Confirmation Cancelled Screen

SureLock Storage      **Unit Information**      Log out

|   |  |                       |
|---|--|-----------------------|
| Unit number: 102  | <a href="#">Remove client</a>                | Current balance:\$190 |
| Unit dimensions: 10'x10'x8'   | Payment Amount: <input type="text"/>         |                       |
| Unit availability: Available  | Payment Method: <input type="text"/>         |                       |
| Unit rent cost: \$190 per month   | Last Payment:                                |                       |
| Full name: <input type="text"/>   | Feb 26, 2019 Credit \$50 ▾                   |                       |
| Email: <input type="text"/>   | <a href="#">See full transaction history</a> |                       |
| Phone: <input type="text"/>   | <a href="#">Transaction Document</a>         |                       |
| Annotation:<br><div style="border: 1px solid black; height: 80px; padding: 5px;"></div> |  |                       |
| <a href="#">Save</a> <a href="#">Cancel</a>   |  |                       |

Figure 11.7: UCSFI-05 UI Screen 5 – Unit Confirmation Editing Screen

**SureLock Storage**      **Unit Information**      [Log out](#)

Unit number: 102      [Remove client](#)

Unit dimensions: 10'x10'x8'

Unit availability: Available ▾

Unit rent cost: \$190 per month

Full name:

Email:

Phone:

Annotation:

Current balance: \$190

Payment Amount:

Payment Method:

Last Payment:  ▾

[See full transaction history](#)

[Transaction Document](#)

**Save**      **Cancel**

Figure 11.8: UCSFI-05 UI Exception 6a: UI Screen 1 – Cancelling Unit Confirmation Editing Screen

**SureLock Storage**      **Unit Information**      [Log out](#)

Unit number: 102      Current balance: \$0

Unit dimensions: 10'x10'x8'

Unit availability: Not available

Unit rent cost: \$190 per month

Full name: Joseph Brando

Email: zawarudo@gmail.com

Phone: (250) 223-6969

Annotation:

Paid

Last Payment:  Feb 26, 2019 Credit \$50 ▾

[See full transaction history](#)

[Transaction Document](#)

**Edit**      **Close**

Figure 11.9: UCSFI-05 UI Exception 6a: UI Screen 2 – Unit Confirmation Cancelled Screen

SureLock Storage

## Unit Information

Log out

Unit number: 102

Unit dimensions: 10'x10'x8'

Unit availability: Available

Unit rent cost: \$190 per month

Full name: -

Email: -

Phone: -

Annotation:

-

Current balance: \$190

Last Payment:

[See full transaction history](#)

[Transaction Document](#)

Edit

Close

Figure 11.10: UCSFI-05 UI Screen 6 – Removed Unit Information Screen

The Administrator selects unit 102 from the facility map. The Administrator clicks the “Edit” button to go to the edit mode of the unit information. The Administrator clicks the “Remove client” button and the system ask for a confirmation to remove all information about the client. The Administrator clicks the “Confirm” button. The Administrator clicks the “Save” button and the unit information does not have any information about the client. The system stores the transaction documents into archived transaction documents.

### 7.3.3 Storage Unit Information Use Cases

#### Use Case UCSUI-01: Viewing Unit Information (Unrestricted for Administrators)

Actors: Administrators

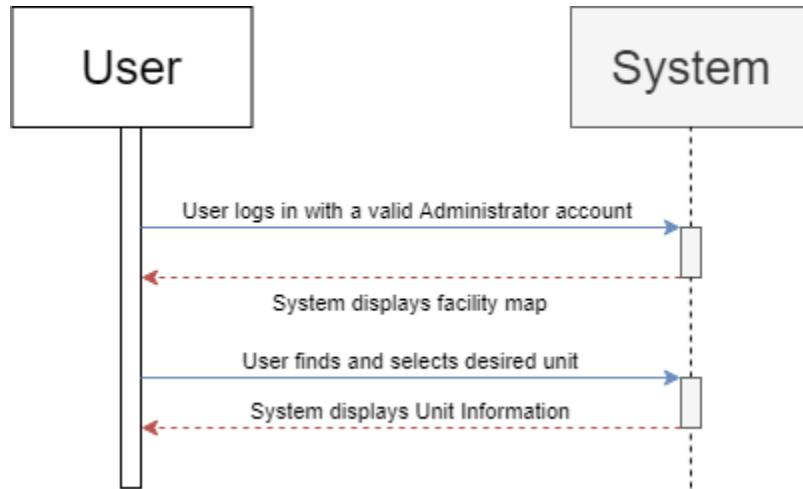
Precondition: The user has logged in to the system under an Administrator account

Steps:

1. The user selects a specific unit from the facility map
2. The system displays the following information that corresponds to the selected unit:
  - o Unit Number
  - o Unit Dimensions
  - o Unit Availability
  - o Unit Rent Cost
  - o Unit Current Balance
  - o Client's Full Name

- Client's Email
- Client's Phone Number
- Client's Payment Methods
- Transaction Documents
- Last Payment Date
- Annotations

Success Condition: The user is now viewing unit information for the selected unit



*Figure 12: UCSUI-01 Sequence Diagram*



Figure 12.1: UCSUI-01 UI Screen 1 – Facility Map Screen

The screenshot shows a web-based application titled "Unit Information" for unit number 102 at "SureLock Storage". The page displays various details about the unit and its occupant, Joseph Brando. It includes fields for unit number, dimensions, availability, rent cost, current balance, last payment date, transaction history, and annotations. Buttons for "Edit" and "Close" are visible at the bottom.

| Unit Information                           |  |
|--|--|
| Unit number: 102                           | Current balance: \$0                         |
| Unit dimensions: 10'x10'x8'                | Last Payment:                                |
| Unit availability: Not available           | Feb 26, 2019 Credit \$50 ▾                   |
| Unit rent cost: \$190 per month            | <a href="#">See full transaction history</a> |
| Full name: Joseph Brando                   | <a href="#">Transaction Document</a>         |
| Email: zawarudo@gmail.com                  |  |
| Phone: (250) 223-6969                      |  |
| Annotation:                                |  |
| Paid                                       |  |
| <a href="#">Edit</a> <a href="#">Close</a> |  |

Figure 12.2: UCSUI-01 UI Screen 2 – Unit Information Screen

The Administrator selects unit 102 from the facility map. The Administrator sees the unit number, unit dimensions, unit availability, unit rent cost, unit current balance, client's full name, client's email, client's phone number, client's payment methods, transaction documents, last payment date, and annotations.

### Use Case UCSUI-02: Viewing Restricted Unit Information

Actors: Staff Members

Precondition: The user has logged in to the system under a Staff Member account

Steps:

1. The user selects a specific unit from the facility map
2. The system displays the following information that corresponds to the selected unit:
  - o Unit Number
  - o Unit Dimensions
  - o Unit Availability
  - o Unit Rent Cost
  - o Client's Full Name
  - o Client's Email
  - o Client's Phone Number
  - o Annotations

Success Condition: The user is now viewing unit information for the selected unit

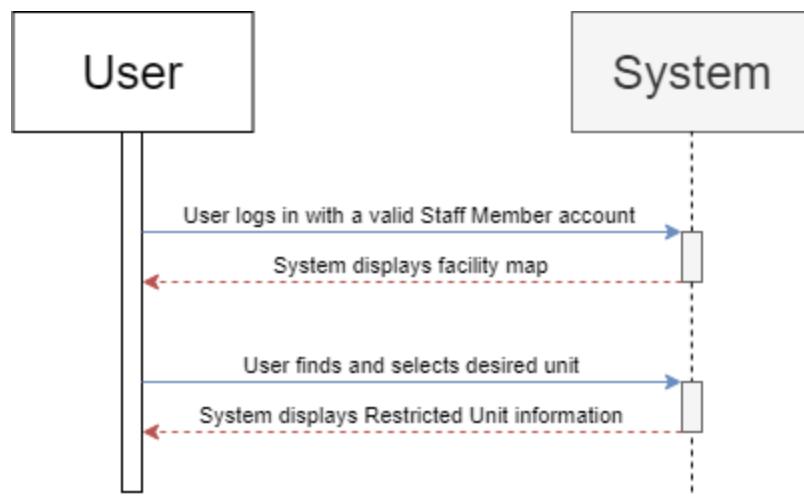


Figure 13: UCSUI-02 Sequence Diagram



Figure 13.1: UCSUI-02 UI Screen 1 – Facility Map Screen

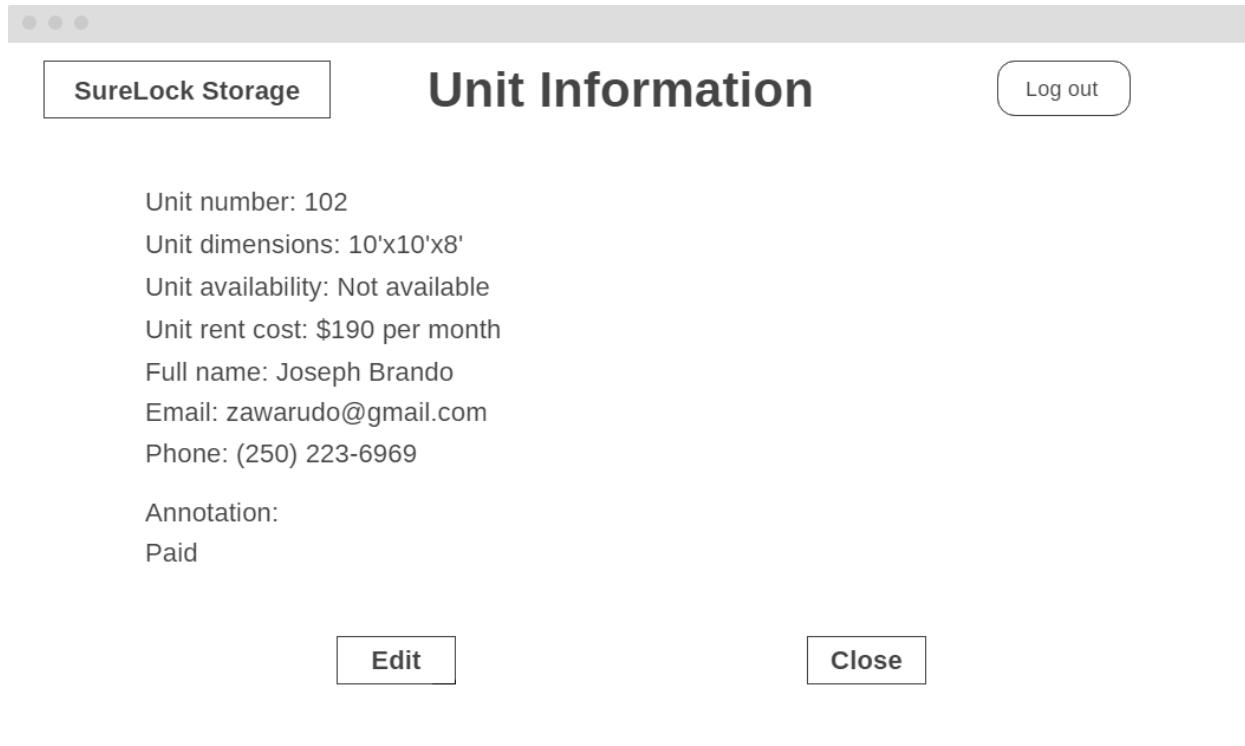


Figure 13.2: UCSUI-02 UI Screen 2 – Unit Information Screen

The Staff Member selects unit 102 from the facility map. The Staff Member sees the unit number, unit dimensions, unit availability, unit rent cost, client's full name, client's email, client's phone number, and annotations.

#### **Use Case UCSUI-03: Annotating Units**

Actors: Administrators and Staff Members

Precondition: The user has logged in under a valid account

Steps:

1. The user selects a specific unit
2. The information regarding that unit will be displayed
3. The user selects edit
4. The user navigates to the annotation field
5. The user adds their comments to the unit
6. The user selects to save the annotation

Success Condition: The annotations for the selected unit are saved and will be viewable by any user of the system

Exception: 6a) The user cancels their unit annotation before submitting. The annotation is not saved to the unit information. The use case ends

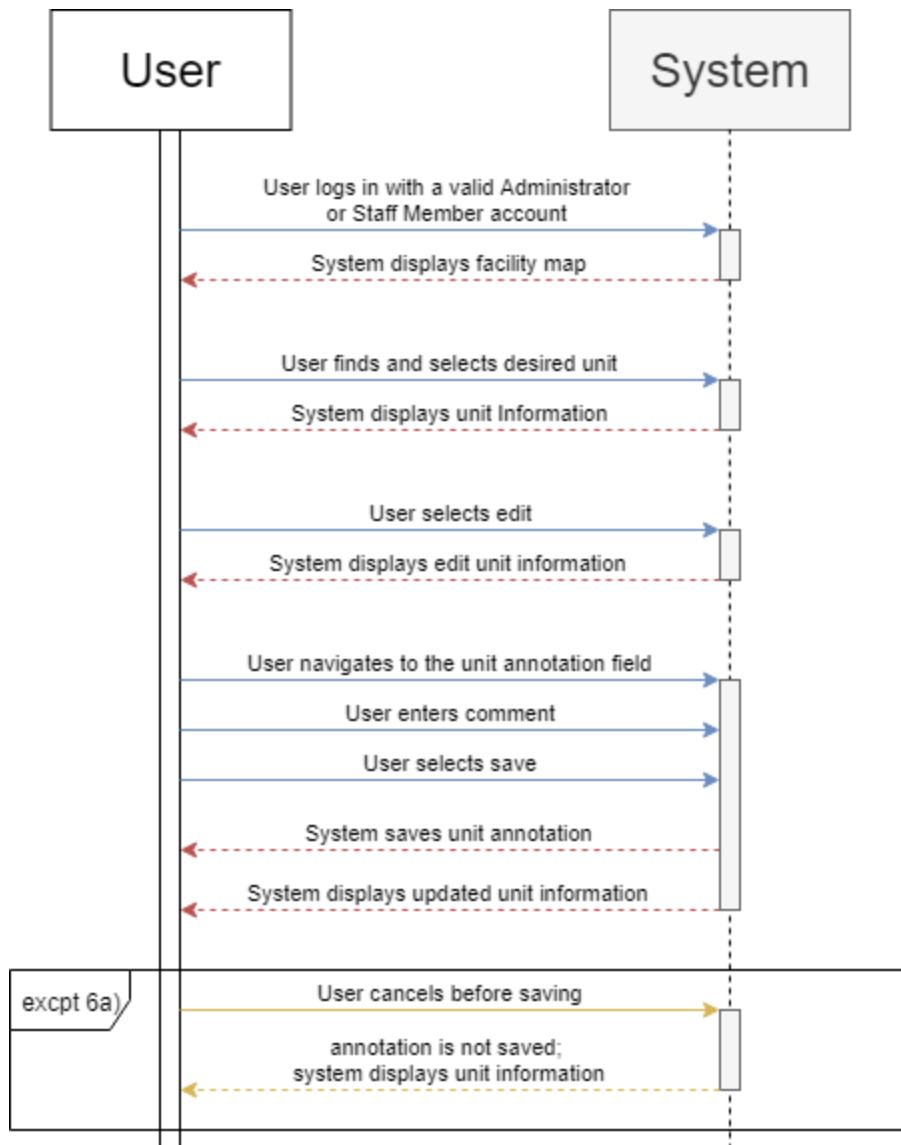


Figure 14: UCSUI-03 Sequence Diagram

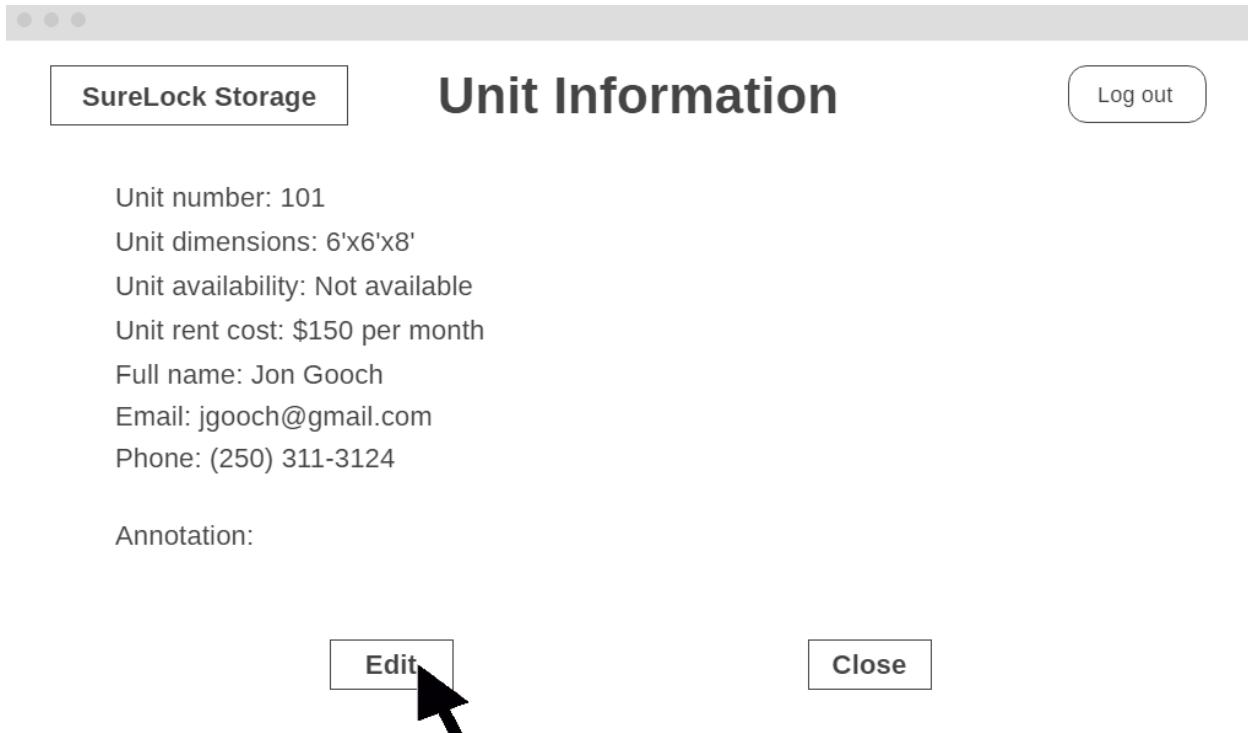


Figure 14.1: UCSUI-03 UI Screen 1 – Unit Information Screen

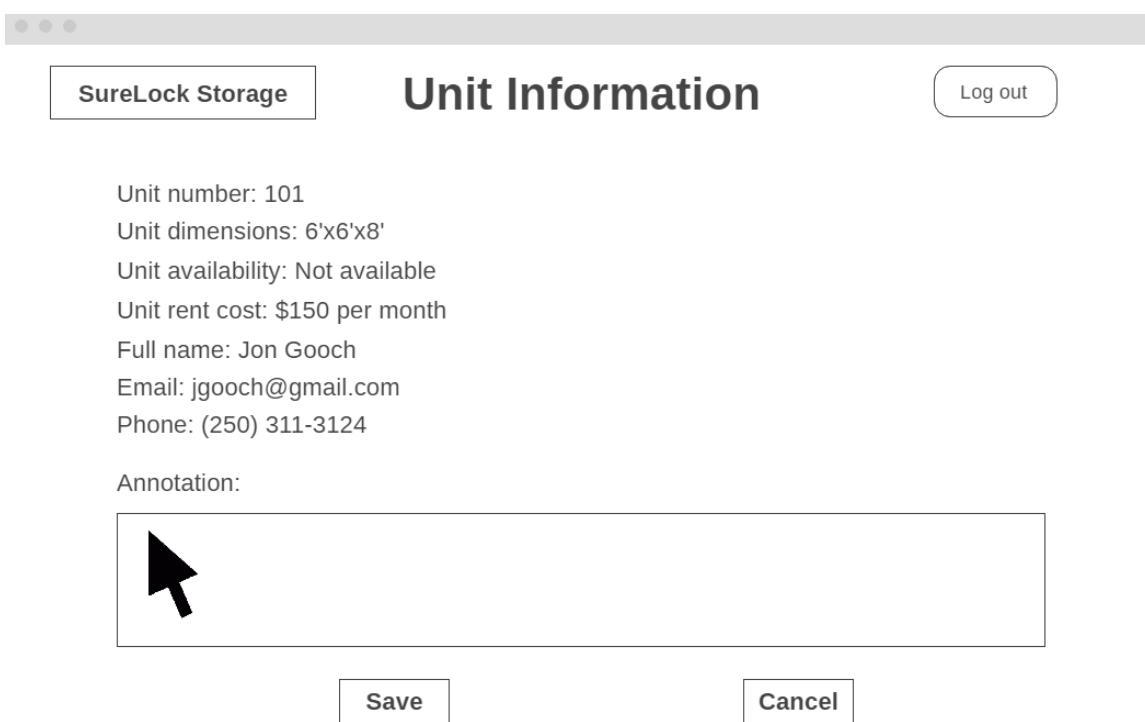


Figure 14.2: UCSUI-03 UI Screen 2 – Unit Information Editing Screen

...  
SureLock Storage      **Unit Information**      Log out

Unit number: 101  
Unit dimensions: 6'x6'x8'  
Unit availability: Not available  
Unit rent cost: \$150 per month  
Full name: Jon Gooch  
Email: jgooch@gmail.com  
Phone: (250) 311-3124

Annotation:

Test

**Save**  **Cancel**

Figure 14.3: UCSUI-03 UI Screen 3 – Unit Information Editing Screen with Annotation

...  
SureLock Storage      **Unit Information**      Log out

Unit number: 101  
Unit dimensions: 6'x6'x8'  
Unit availability: Not available  
Unit rent cost: \$150 per month  
Full name: Jon Gooch  
Email: jgooch@gmail.com  
Phone: (250) 311-3124

Annotation:

Test

**Save**  **Cancel**

Figure 14.4: UCSUI-03 Exception 6a: UI Screen 1 – Cancelling Unit Information Editing Screen with Annotation

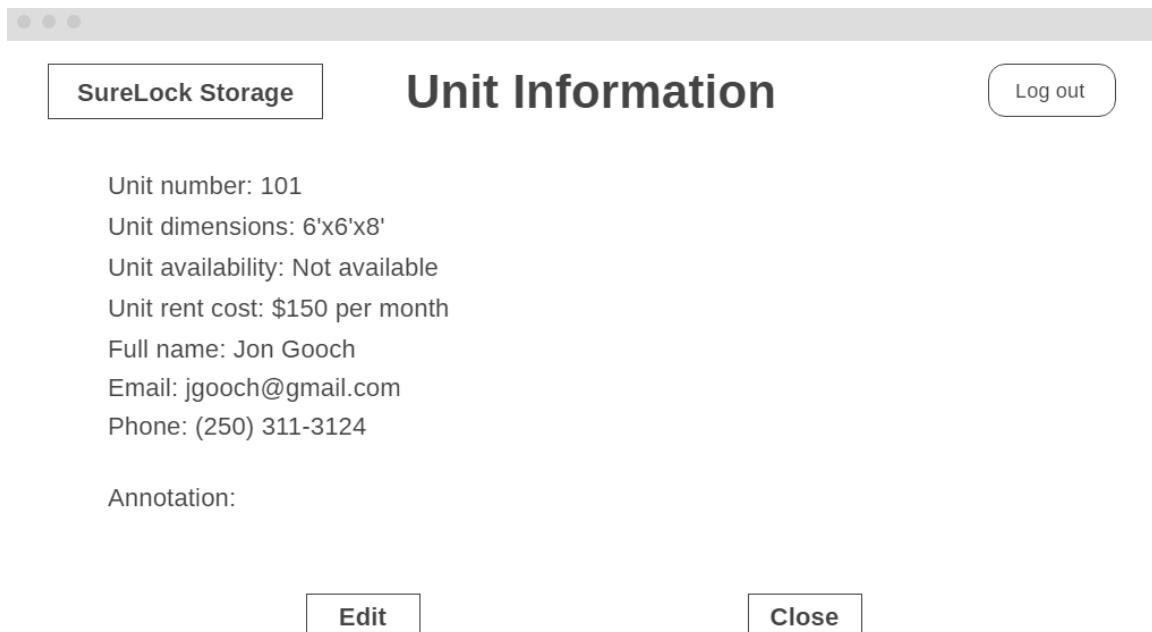


Figure 14.5: UCSUI-03 Exception 6a: UI Screen 2 – Cancelled Unit Information Screen

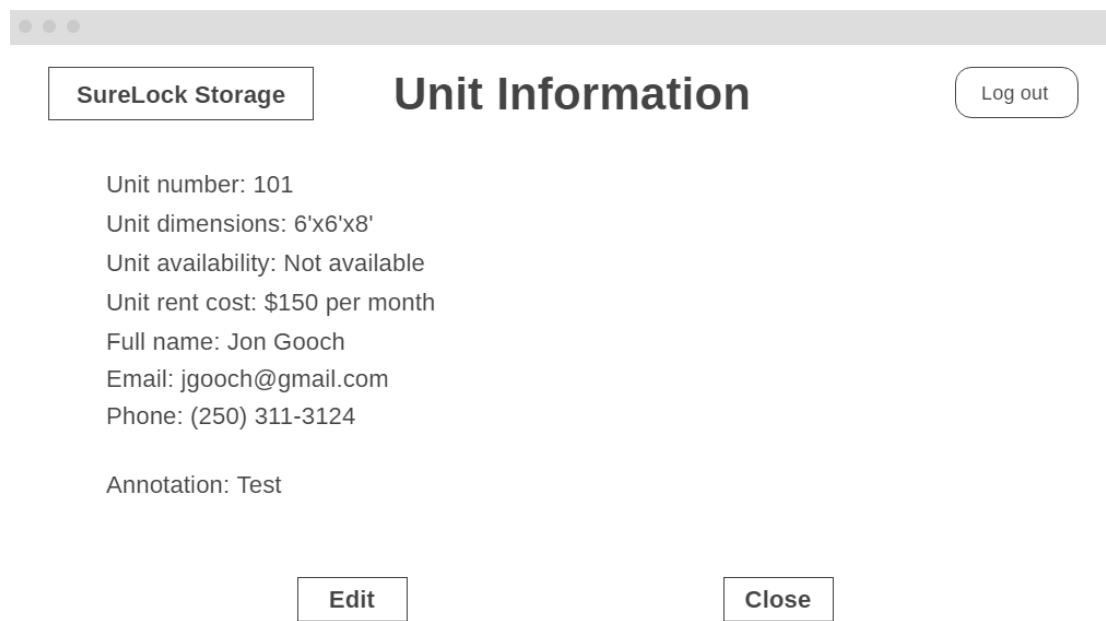


Figure 14.6: UCSUI-03 UI Screen 4 – Unit Information Screen with Annotation

The user selects unit 101 from the facility map, which directs the user to the unit information screen. The user clicks the “Edit” button to be directed to the edit mode of the unit information. The user inputs in the annotation box and clicks “Save”. The unit information screen displays inputted annotations.

### Use Case UCSUI-04: Removing an Annotation

Actors: Administrators and Staff Members

Preconditions:

- The user has logged in under a valid account
- There exists a unit with an annotation on its information page
- A unit with an annotation on its information page is selected from the facility map
- 

Steps:

1. The unit information for the selected unit is displayed
2. The user selects edit
3. The user navigates to the annotation field
4. The user removes the comment
5. The user selects save

Success Condition: The annotation is removed from the unit information

Exception: 5a) The user cancels their unit annotation before submitting. The original annotation remains. The use case ends.

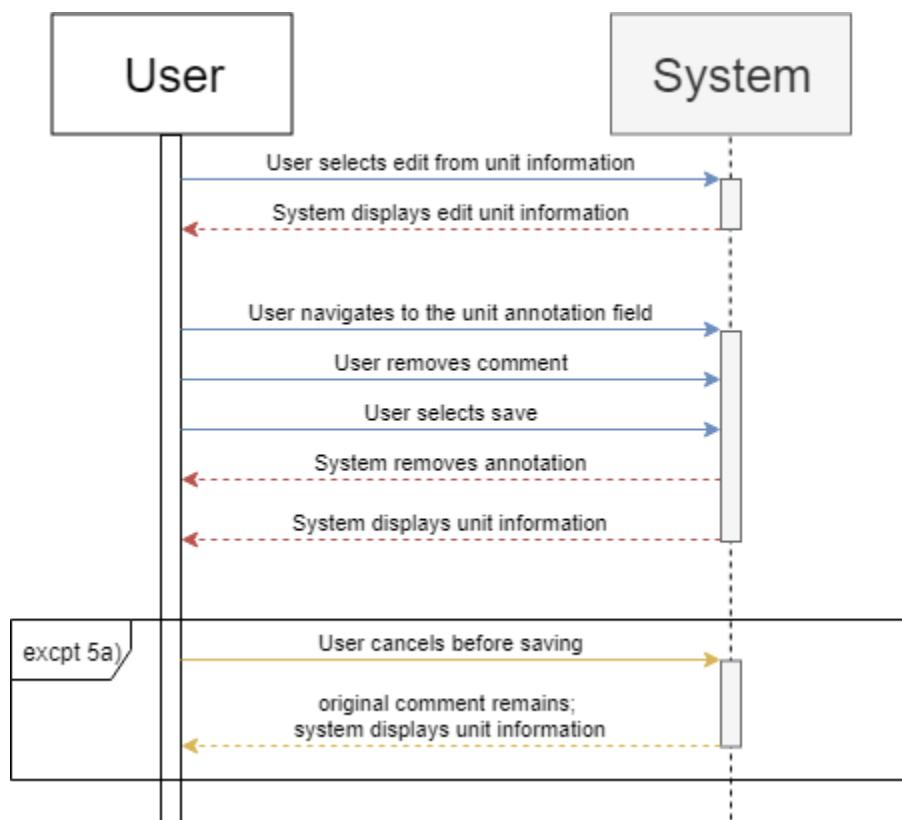


Figure 15: UCSUI-04 Sequence Diagram

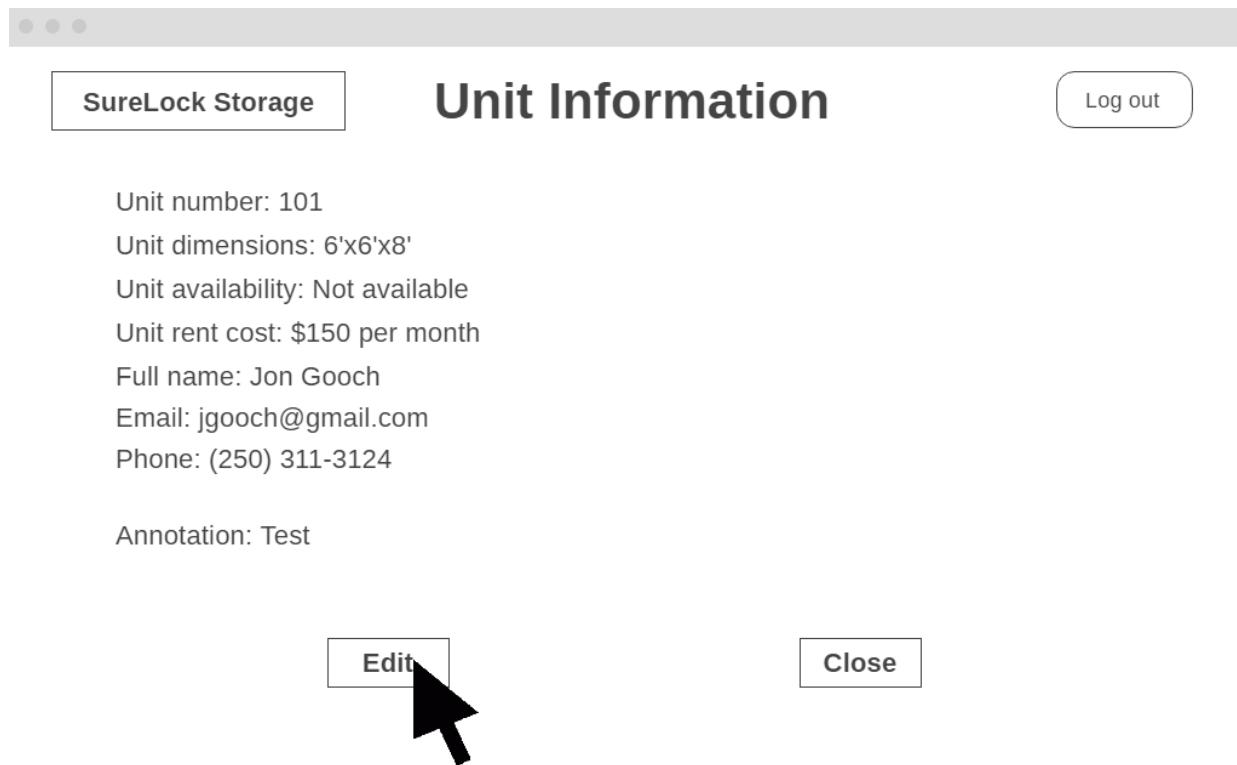


Figure 15.1: UCSUI-04 UI Screen 1 – Unit Information Screen with Annotation

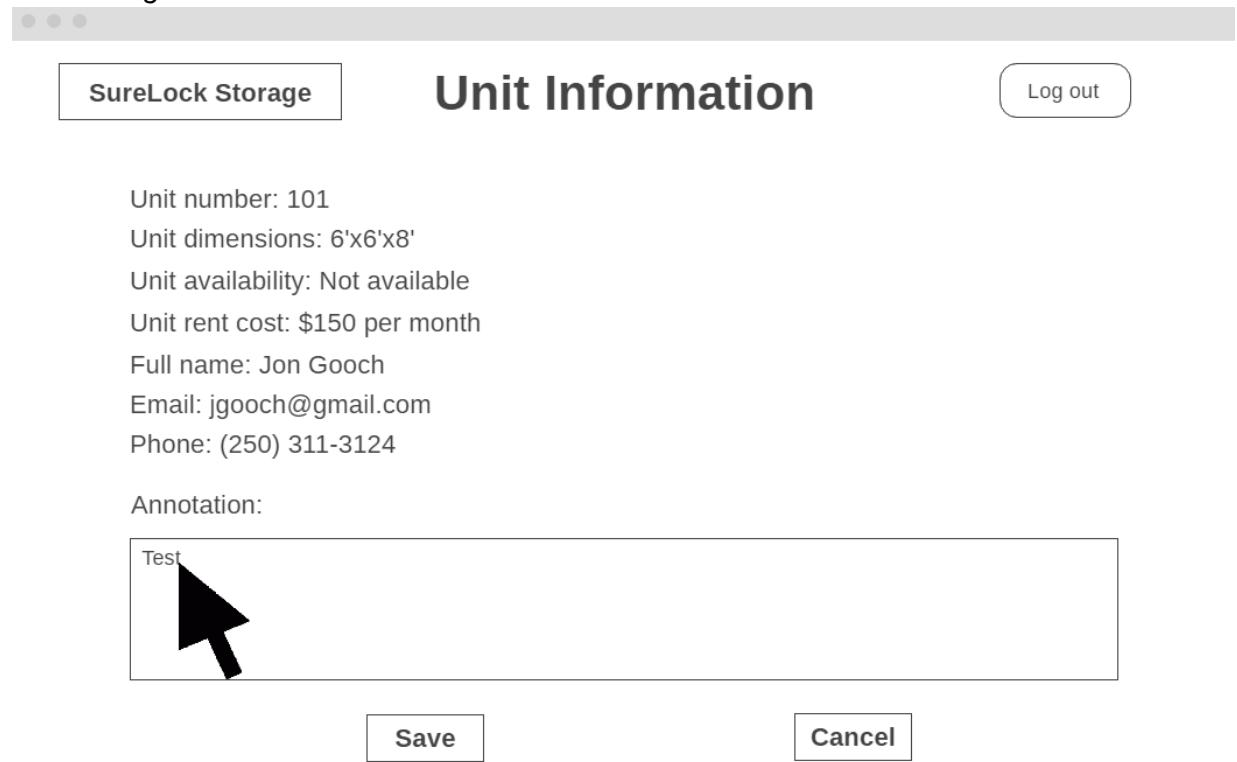


Figure 15.2: UCSUI-04 UI Screen 2 – Unit Information Editing Screen

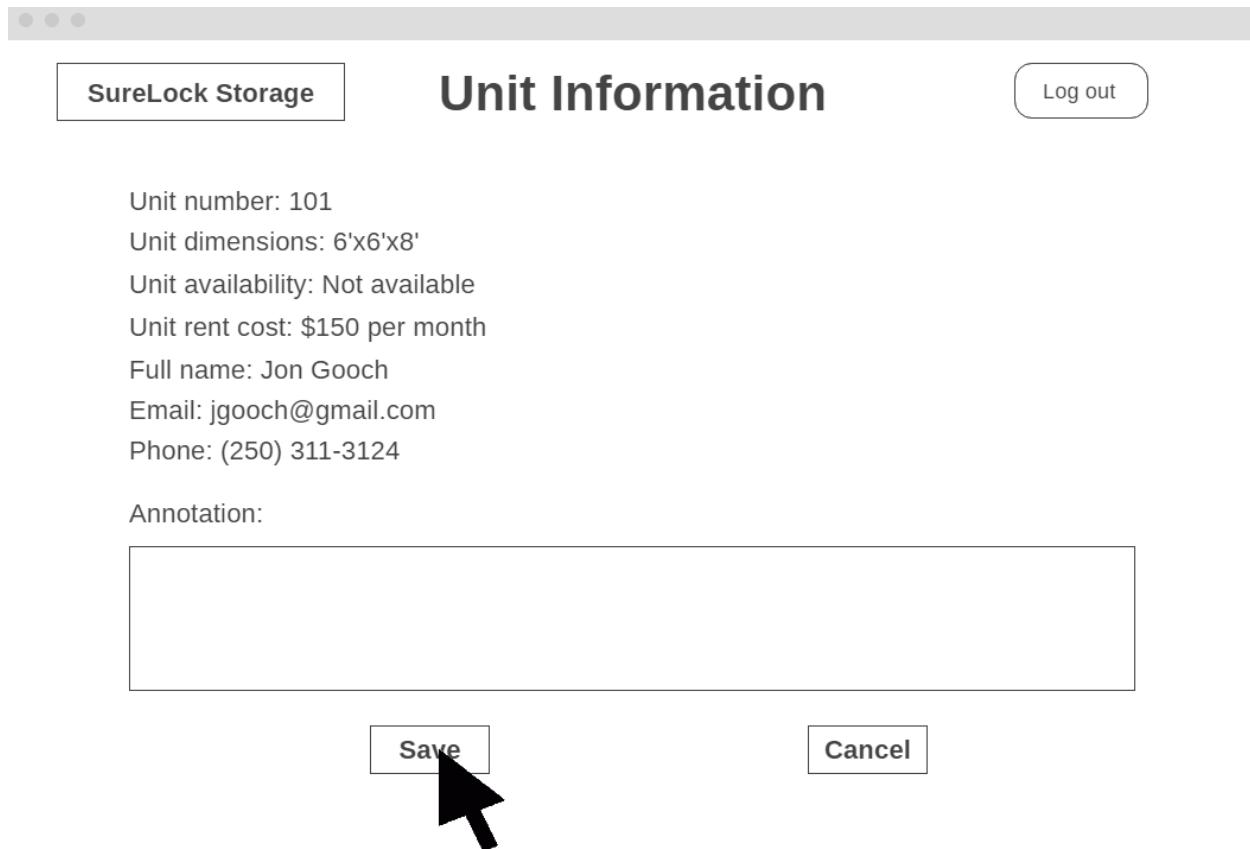


Figure 15.3: UCSUI-04 UI Screen 3– Unit Information Editing Save Screen

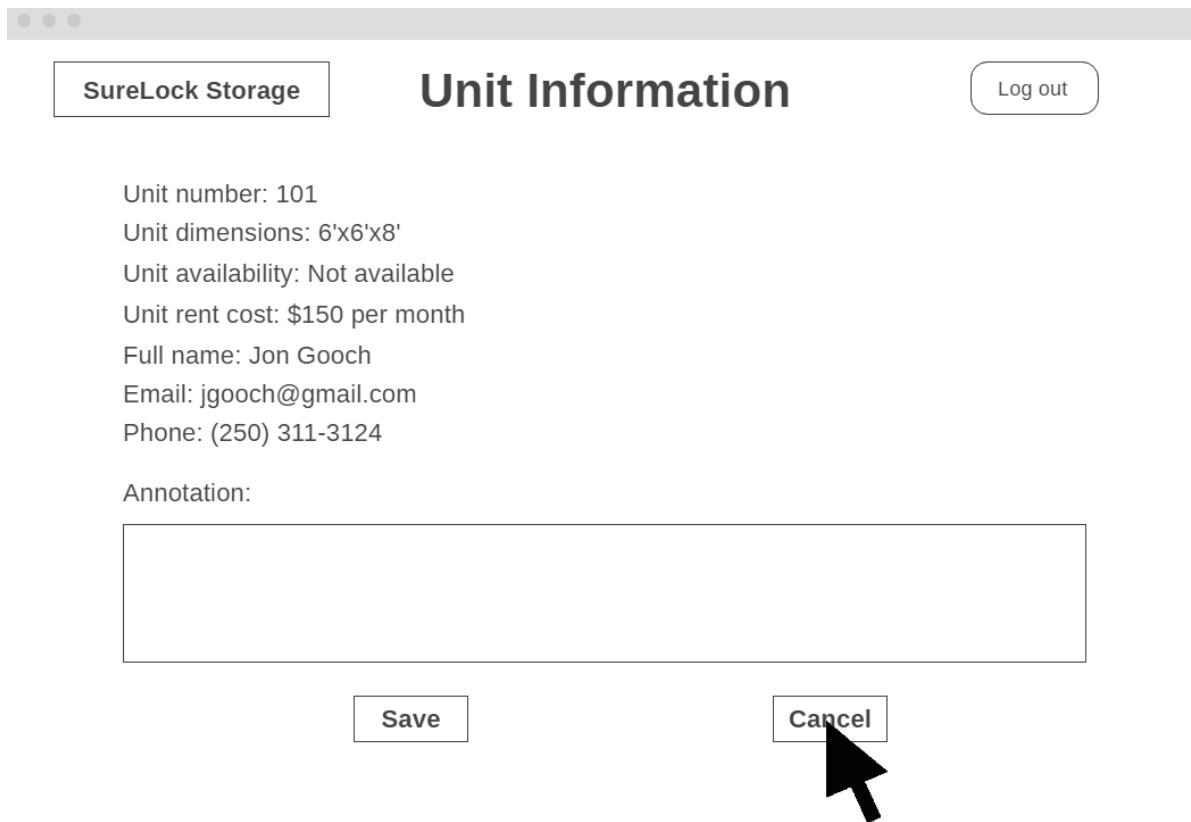


Figure 15.4: UCSUI-04 UI Exception 6a: UI Screen 1 – Cancelling Unit Information Editing Screen

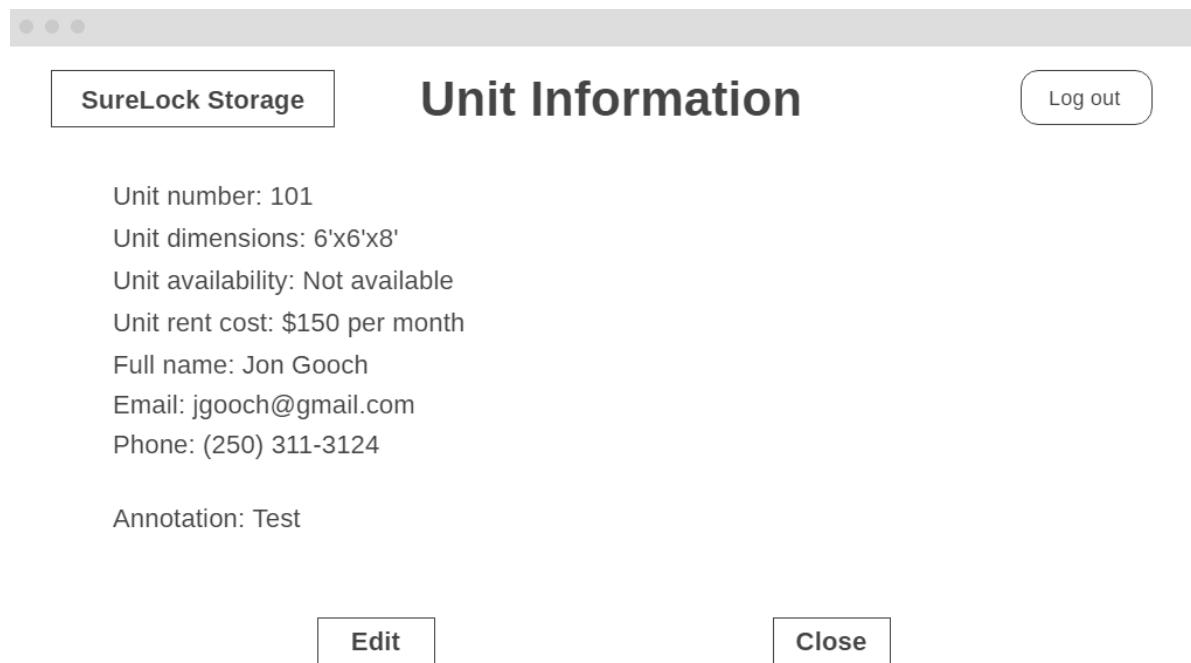


Figure 15.5: UCSUI-04 UI Exception 6a: UI Screen 2 – Unit Information Editing Cancel Screen

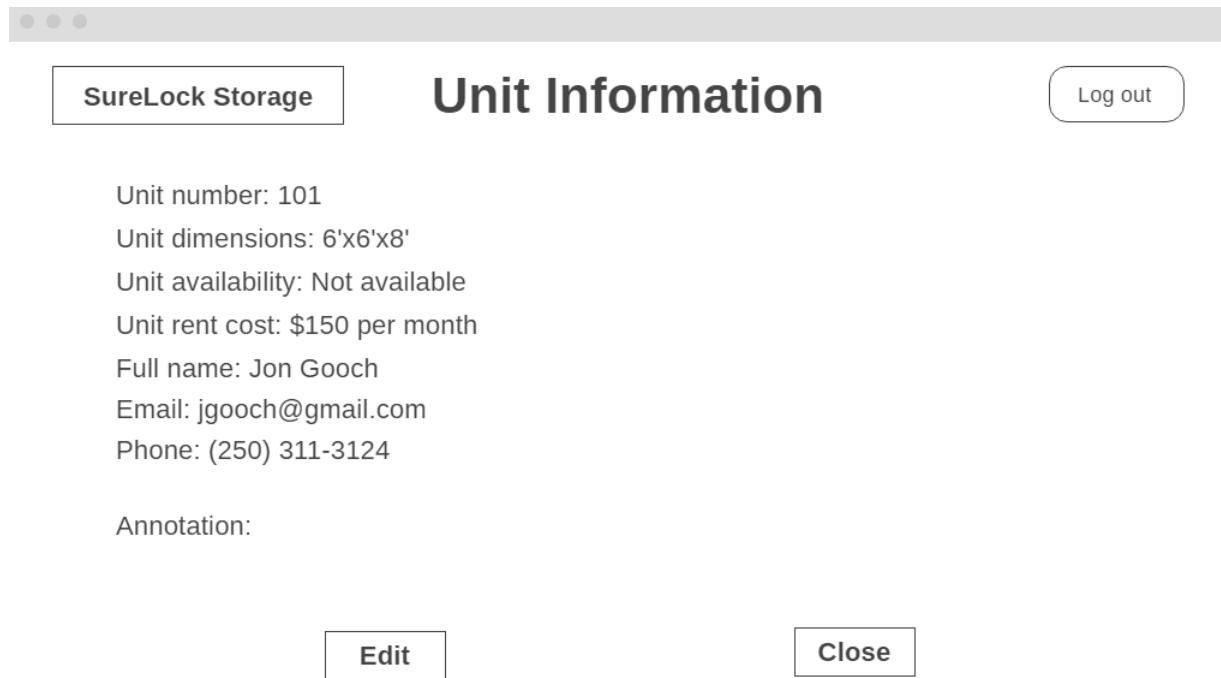


Figure 15.6: UCSUI-04 UI Screen 4– Unit Information Screen

The user selects unit 101 from the facility map, which directs the user to the unit information screen. The user clicks the “Edit” button to be directed to the edit mode of the unit information. The user removes the annotation and clicks “Save”. The unit information screen displays no annotations.

### Use Case UCSUI-05: Balance Update

Actors: Administrators

Precondition:

- The user has logged in under an Administrator account
- There exists a unit with an associated client

Steps:

1. The user selects a unit from the facility map
2. The unit information for the selected unit is displayed
3. The user selects to edit the unit information
4. The user selects the payment method
5. The user enters a payment amount
6. The user selects to save the unit information

Success Condition: The system updates and decreases the current balance correspondingly and updates the last payment

Alternate Path: 3a) The user also adds a transaction document to the unit information. The system displays a confirmation message of success.

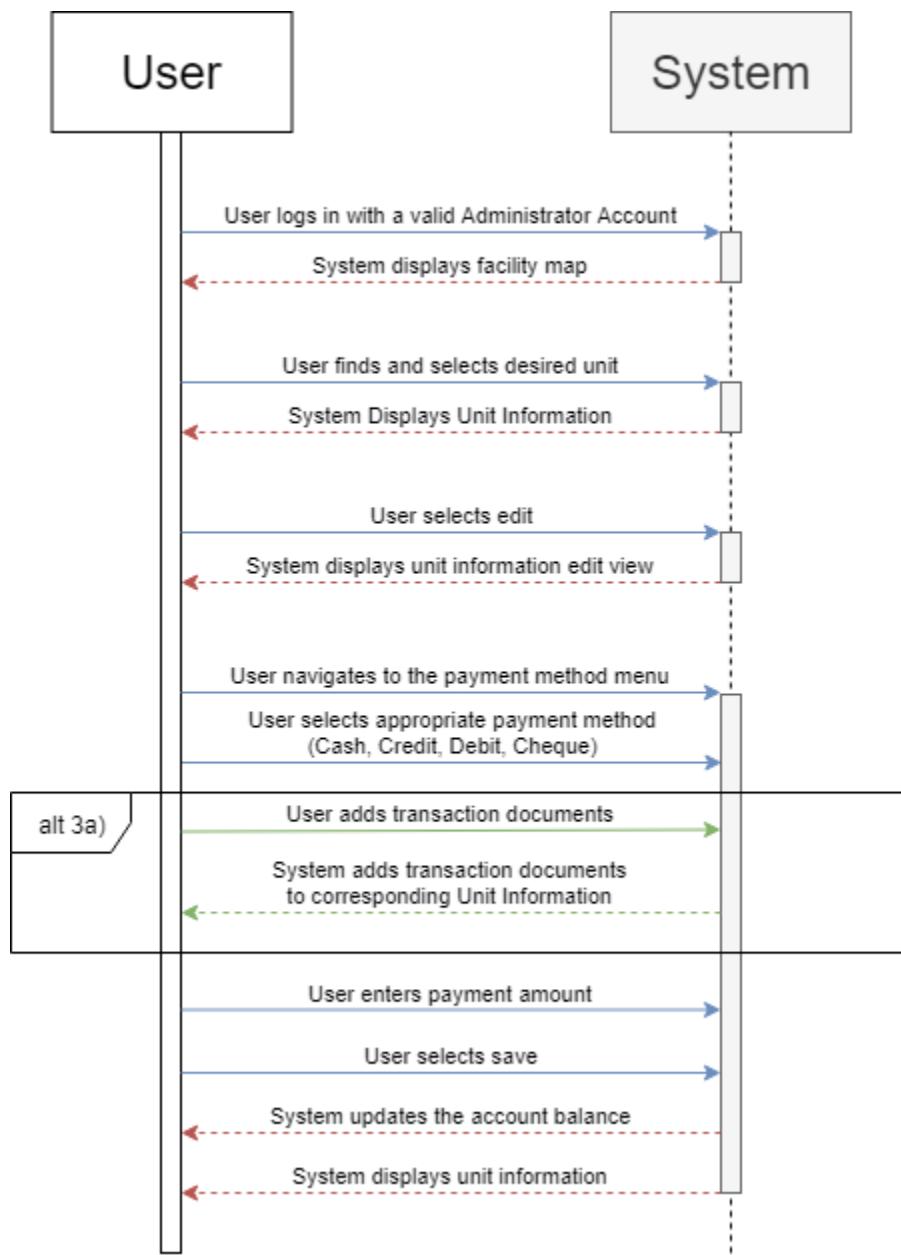


Figure 16: UCSUI-05 Sequence Diagram



Figure 16.1: UCSUI-05 UI Screen 1 – Facility Map Screen

SureLock Storage

## Unit Information

Log out

Unit number: 104

Unit dimensions: 10'x10'x8'

Unit availability: Not available

Unit rent cost: \$150 per month

Full name: Yves Larock

Email: yveslarock@gmail.com

Phone: (250) 333-1231

Annotation:

Current balance: **\$150**

Last Payment:

Feb 1, 2019    Cash    \$150 ▾

[See full transaction history](#)

[Transaction Document](#)

**Edit**  **Close**

Figure 16.2: UCSUI-05 UI Screen 2 – Unit Information Screen

SureLock Storage

## Unit Information

Log out

Unit number: 104

Unit dimensions: 10'x10'x8'

Unit availability:

Unit rent cost:

Full name:

Email:

Phone:

Annotation:

Current balance: **\$150**

Payment Amount:

Payment Method:

Last Payment:

Feb 1, 2019    Cash    \$150 ▾

[See full transaction history](#)

[Transaction Document](#)

**Save** **Cancel**

Figure 16.3: UCSUI-05 UI Screen 3 – Unit Information Editing Screen

SureLock Storage      **Unit Information**      Log out

Unit number: 104      Remove client      Current balance: \$150

Unit dimensions: 10'x10'x8'

Unit availability: Not available

Unit rent cost: \$150 per month

Full name: Yves Larock

Email: yveslarock@gmail.com

Phone: (250) 333-1231

Annotation:

Payment Amount:

Payment Method:

Last Payment:  
Feb 1, 2019      Cash      \$150

[See full transaction history](#)

**Transaction Document**

Save      Cancel

Figure 16.4: UCSUI-05 Alternate 3a: UI Screen 1 – Unit Information Editing Screen Selecting Transaction Document

SureLock Storage      **Unit Information**      Log out

Unit number: 104      Remove client      Current balance: \$150

Unit dimensions: 10'x10'x8'

Unit availability: Not available

Unit rent cost: \$150 per month

Full name: Yves Larock

Email: yveslarock@gmail.com

Phone: (250) 333-1231

Annotation:

Payment Amount:

Payment Method:

Last Payment:  
Feb 1, 2019      Cash      \$150

**Transaction Documents**

2018 Transaction Document      Download

Upload

Save      Cancel

Figure 16.5: UCSUI-05 UI Alternate 3a: UI Screen 2 – Uploading Transaction Document Screen

SureLock Storage      **Unit Information**      Log out

Unit number: 104      Remove client      Current balance: \$150  
 Unit dimensions: 10'x10'x8'      Payment Amount:   
 Unit availability:  N      Transaction Documents   
 Unit rent cost:  S      2019 Transaction Document   
 Full name:  Y      2018 Transaction Document   
 Email:  Y      \$150   
 Phone:  G  
 Annotation:   
        
 2019 Transaction Document.pdf Uploaded

Figure 16.6: UCSUI-05 UI Alternate 3a: UI Screen 3 – Uploaded Transaction Document Screen

SureLock Storage      **Unit Information**      Log out

Unit number: 104      Remove client      Current balance: \$50  
 Unit dimensions: 10'x10'x8'  
 Unit availability: Not available   
 Unit rent cost: \$150 per month  
 Full name: Yves Larock  
 Email: yveslarock@gmail.com  
 Phone: (250) 333-1231  
 Last Payment:  
 Mar 2, 2019      Debit      \$100   
 See full transaction history        
 Annotation:   
     

Figure 16.7: UCSUI-05 Alternate 3a: UI Screen 4 – Save Unit Information Screen

SureLock Storage

## Unit Information

Log out

Unit number: 104 [Remove client](#)

Unit dimensions: 10'x10'x8'

Unit availability: Not available ▾

Unit rent cost: \$150 per month

Full name: Yves Larock

Email: yveslarock@gmail.com

Phone: (250) 333-1231

Current balance: **\$150**

Payment Amount: \$100

Payment Method: Debit

Last Payment:

Feb 1, 2019 Cash \$150 ▾

[See full transaction history](#)

[Transaction Document](#)

Annotation:

Save

Cancel

Figure 16.8: UCSUI-05 UI Screen 4 – Save Unit Information Screen

SureLock Storage

## Unit Information

Log out

Unit number: 104

Unit dimensions: 10'x10'x8'

Unit availability: Not available

Unit rent cost: \$150 per month

Full name: Yves Larock

Email: yveslarock@gmail.com

Phone: (250) 333-1231

Current balance: **\$50**

Last Payment:

Mar 2, 2019 Debit \$100 ▾

[See full transaction history](#)

[Transaction Document](#)

Annotation:

-

Edit

Close

Figure 16.9: UCSUI-05 UI Screen 4 – Updated Unit Information Screen

The Administrator selects unit 104 from the facility map. The Administrator is directed to the unit information screen of the selected unit. The Administrator clicks the “Edit” button to be directed to the edit mode of the unit information screen. The Administrator enters the payment amount and selects payment method. The Administrator clicks the “Save” button and the system updates the current balance and last payment with the inputted payment amount and payment method. The Administrator is also able to upload a transaction document. The Administrator clicks the “Transaction Document” button and the system displays a pop-up with a list of the transaction documents. The Administrator clicks the “Upload” button; the file is uploaded, and a success message is displayed.

### **Use Case UCSUI-06: Edit Unit Information**

Actors: Administrators

Precondition: The user has logged in under an Administrator account

Steps:

1. The user selects a unit from the facility map
2. The user views the information specified in UCSUI-01
3. The user selects to edit the unit Information
4. The user edits the following fields:
  - Unit Rent Cost
  - Client's Full Name
  - Client's Email
  - Client's Phone Number
  - Client's Payment Amount
  - Client's Payment Methods
5. The user selects to save the unit Information.

Success Condition: The system displays the updated unit Information

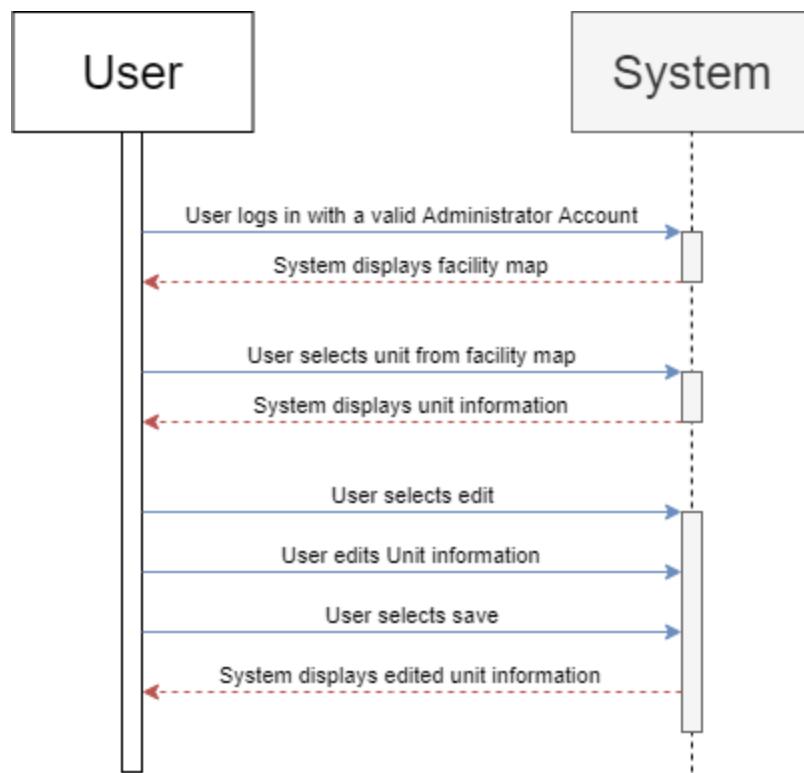


Figure 17: UCSUI-06 Sequence Diagram

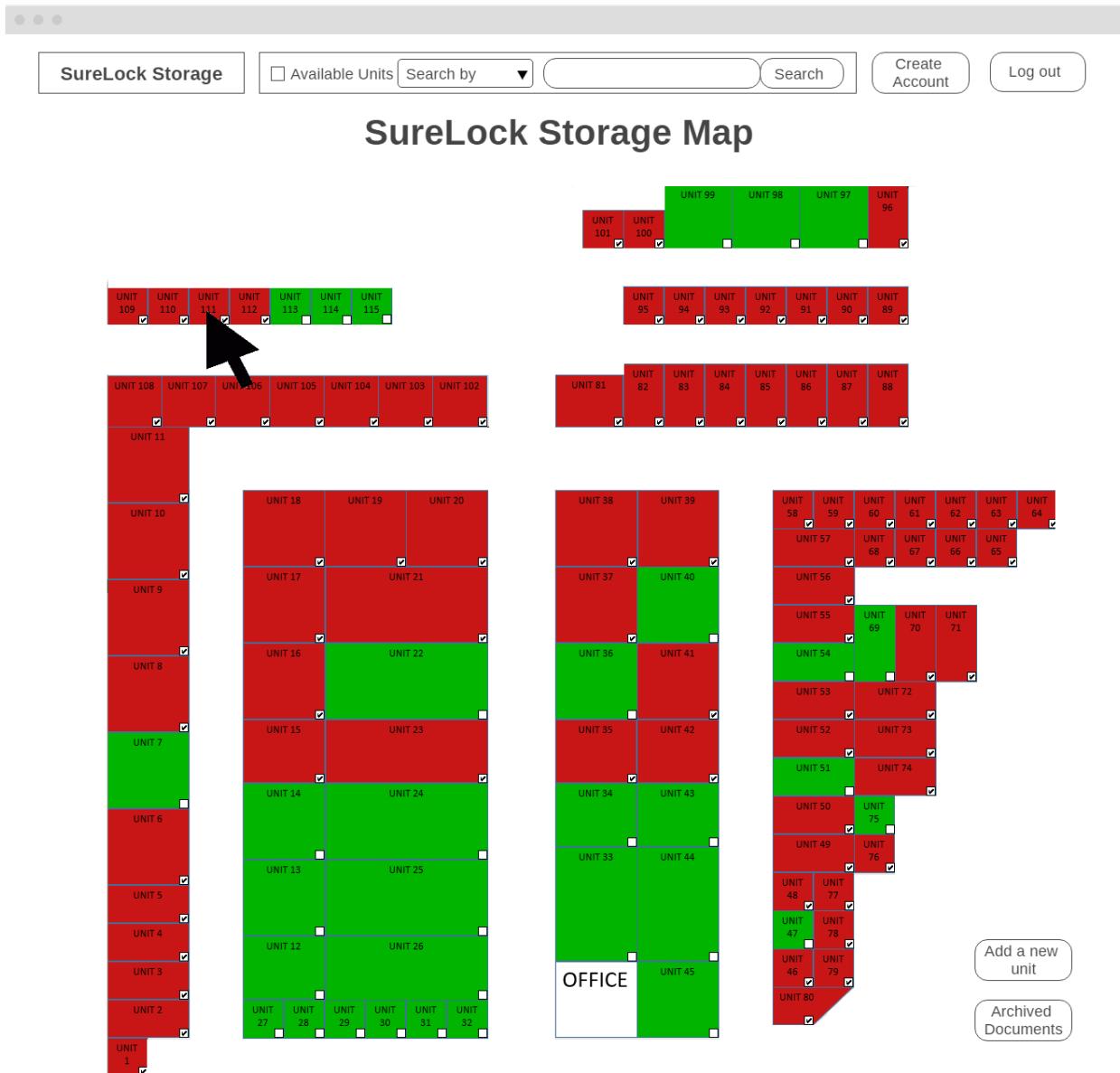


Figure 17.1: UCSUI-06 UI Screen 1 – Facility Map Screen

SureLock Storage

## Unit Information

Log out

Unit number: 111

Unit dimensions: 5'x5'x8'

Unit availability: Not available

Unit rent cost: \$110 per month

Full name: Donald Trump

Email: donaldtrump@gmail.com

Phone: (250) 911-1234

Annotation:  
Also renting unit 23

Current balance: **\$660**

Last Payment:

Feb 26, 2019 Credit \$50 ▾

[See full transaction history](#)

[Transaction Document](#)

Edit

Close

Figure 17.2: UCSUI-06 UI Screen 2 – Unit Information Screen

SureLock Storage

## Unit Information

Log out

Unit number: 111

Remove client

Current balance: **\$660**

Unit dimensions: 5'x5'x8'

Unit availability: Not available ▾

Unit rent cost: \$110 per month

Full name: Donald Trump

Email: donaldtrump@gmail.com

Phone: (250) 911-1234

Last Payment:

Feb 26, 2019 Credit \$50 ▾

[See full transaction history](#)

[Transaction Document](#)

Annotation:  
Also renting unit 23

Save

Cancel

Figure 17.3: UCSUI-06 UI Screen 3 – Unit Information Editing Screen

SureLock Storage

## Unit Information

Log out

Unit number: 111 Remove client

Unit dimensions: 5'x5'x8'

Unit availability: Not available ▾

Unit rent cost: \$120 per month

Full name: Ivanka Trump

Email: ivankatrump@gmail.com

Phone: (250) 231-1235

Annotation:  
Also renting unit 23

Current balance: **\$660**

Payment Amount: \$600

Payment Method: Debit

Last Payment:

Feb 26, 2019 Credit \$50 ▾

[See full transaction history](#)

Transaction Document

Save Cancel

Figure 17.4: UCSUI-06 UI Screen 4 – Unit Information Editing Screen Edited

SureLock Storage

## Unit Information

Log out

Unit number: 111

Unit dimensions: 5'x5'x8'

Unit availability: Not available

Unit rent cost: \$120 per month

Full name: Ivanka Trump

Email: ivankatrump@gmail.com

Phone: (250) 231-1235

Annotation:  
Also renting unit 23

Current balance: **\$60**

Last Payment:

Mar 26, 2019 Debit \$600 ▾

[See full transaction history](#)

Transaction Document

Edit Close

Figure 17.5: UCSUI-06 UI Screen 5 – Unit Information Screen Edited

The Administrator selects unit 111 from the facility map. The Administrator views the unit information screen. The Administrator clicks the “Edit” button to enter the edit mode of the unit information. The Administrator edits the unit availability, unit rent cost, unit current balance, client’s full name, client’s email, client’s phone number, client’s payment amount, client’s payment methods, and transaction documents. The Administrator selects the “Save” button to save the changes. The Administrator sees the new changes in the unit information screen.

### 7.3.4 System Searching Feature Use Cases

#### **Use Case UCSSF-01: Search by Client Information**

Actors: Administrators and staff members

Precondition: The user has logged in under a valid account

Steps:

1. The user selects the searching feature
2. The user selects to search by full name and enters a client’s full name
3. The system displays one or more units with client full names that match the entered full name
4. The user selects the desired unit and views the unit information

Success Condition: The desired unit information is displayed to the user

Alternate Paths:

- 2a) The user selects to search by phone number and enters a client’s phone number
- 2b) The user selects to search by email and a client’s email

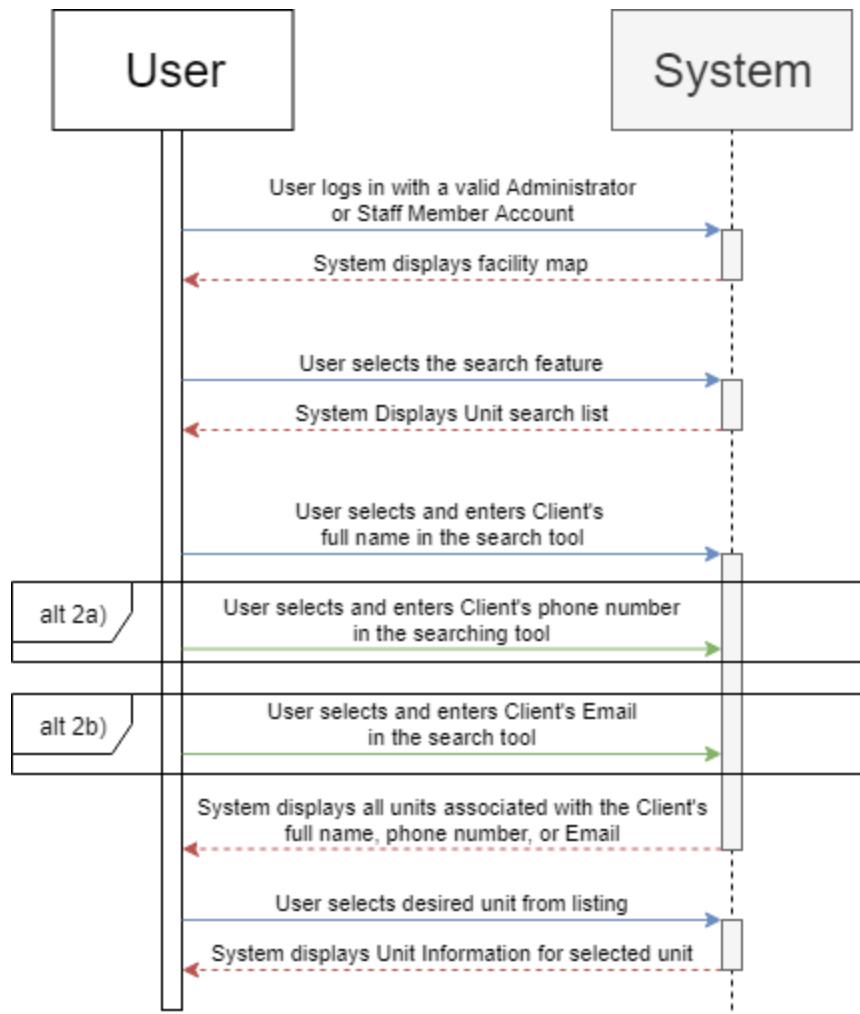


Figure 18: UCSSF-01 Sequence Diagram

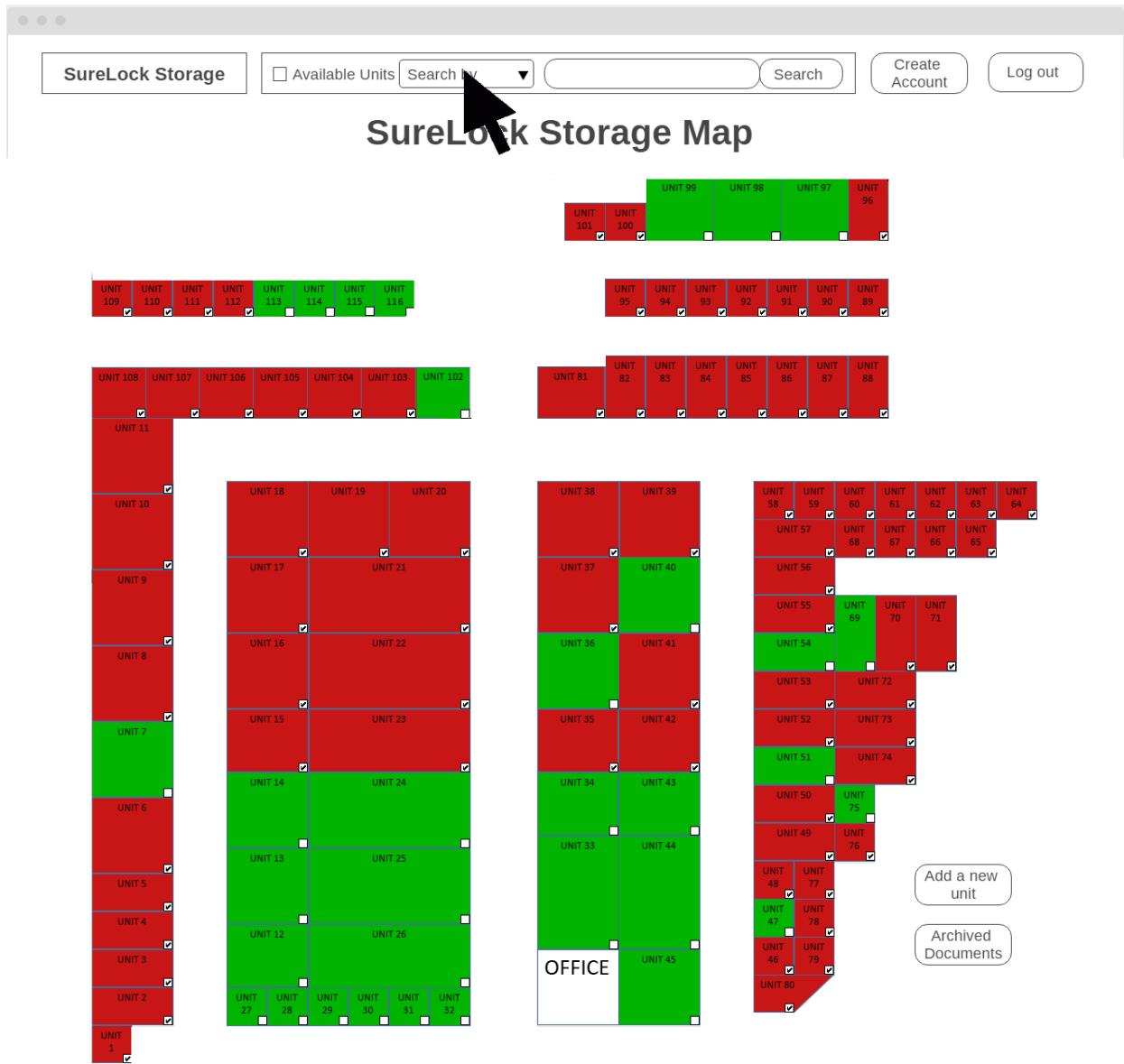


Figure 18.1: UCSSF-01 UI Screen 1 – Facility Map Screen



*Figure 18.2: UCSSF-01 UI Screen 2 – Search by Full Name Screen*



Figure 18.3: UCSSF-01 Alternate 2a: UI Screen 1 – Search by Phone Number Screen



Figure 18.4: UCSSF-01 Alternate 2a: UI Screen 2 – Search Phone Number Screen

The screenshot shows a web-based application interface for 'SureLock Storage'. At the top left is the application title 'SureLock Storage'. To its right is a search bar containing three input fields: 'Available Units' (with a checked checkbox), 'Phone Number' (with a dropdown arrow), and '911'. Next to the search bar are two buttons: 'Search' and 'Log out'. Below the search bar, the title 'Search Results' is centered in a large, bold font. Underneath this title is a table with five columns: 'Unit No.', 'Full Name', 'Phone Number', 'Email', and 'Availability'. Two rows of data are listed:

| Unit No. | Full Name    | Phone Number   | Email                 | Availability  |
|----------|--------------|----------------|-----------------------|---------------|
| 23       | Donald Trump | (250) 911-1234 | donaldtrump@gmail.com | Not Available |
| 111      | Donald Trump | (250) 911-1234 | donaldtrump@gmail.com | Not Available |

At the bottom center of the page, the text 'End of list' is displayed.

Figure 18.5: UCSSF-01 Alternate 2a: UI Screen 3 – Search Phone Number Results Screen

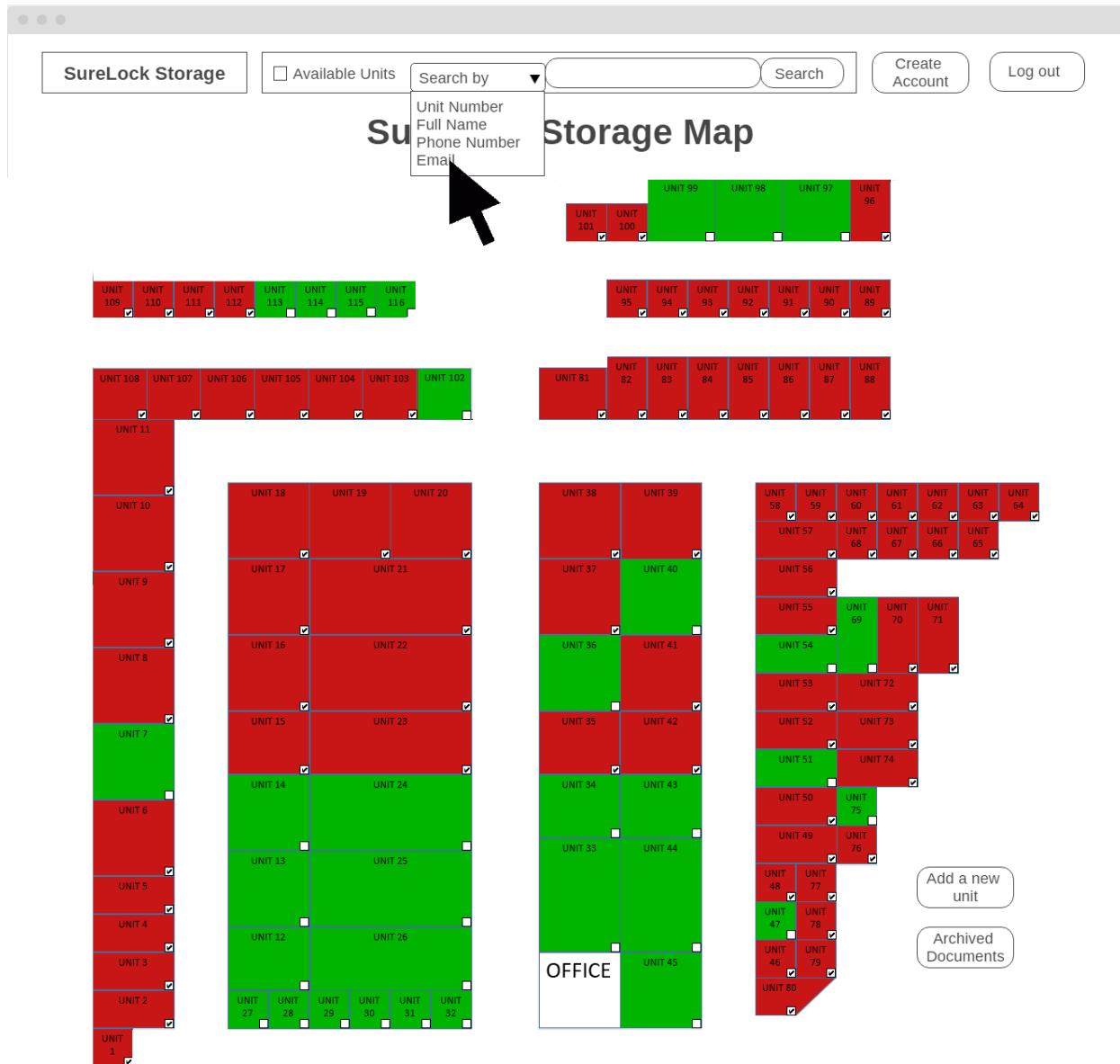


Figure 18.6: UCSSF-01 Alternate 2b: UI Screen 1 – Search by Email Screen

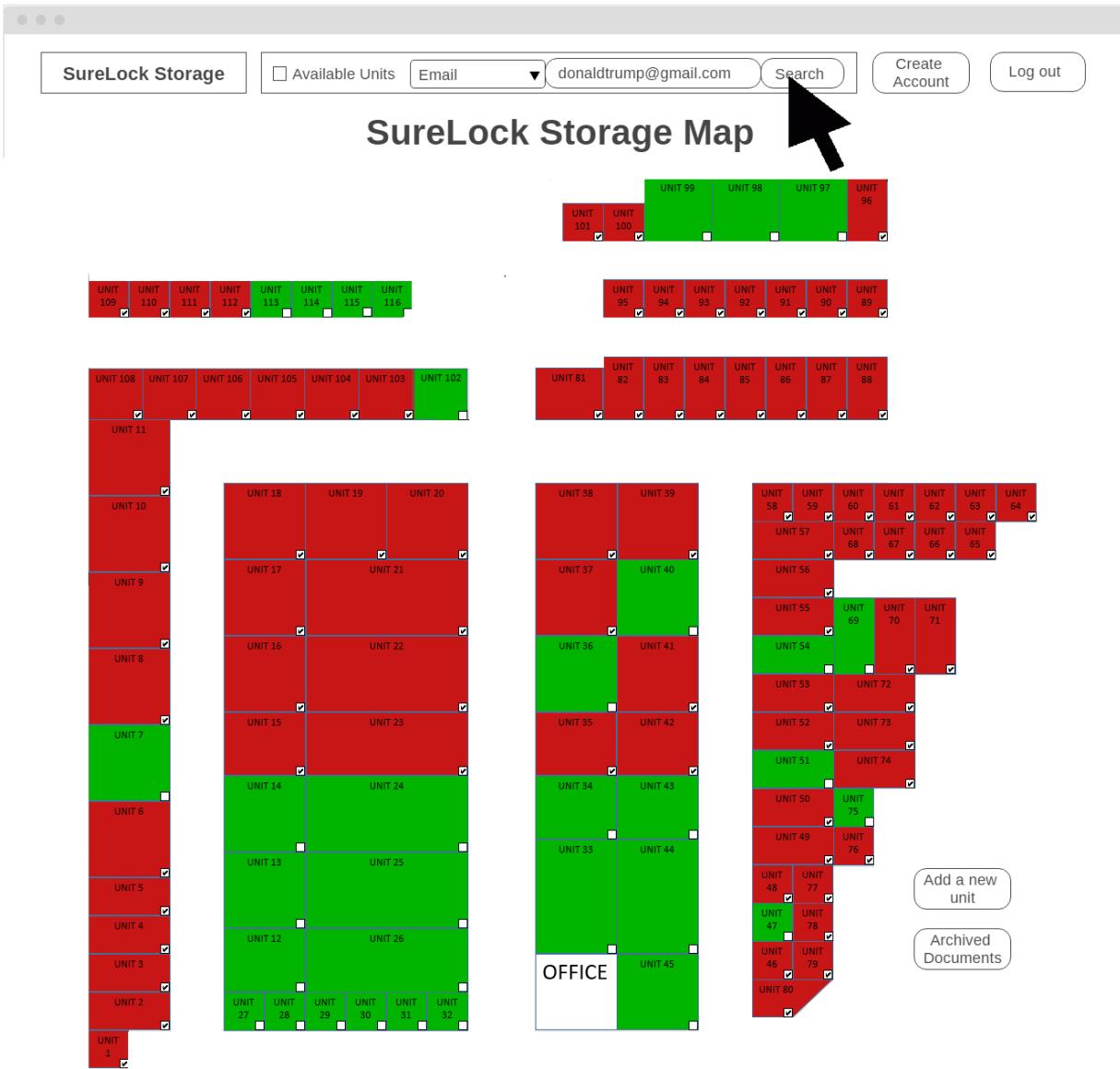


Figure 18.7: UCSSF-01 Alternate 2b: UI Screen 2 – Search by Email Screen

SureLock Storage

Available Units Email ▾ donaldtrump@gmail.com Search Log out

## Search Results

| Unit No. | Full Name    | Phone Number   | Email                 | Availability  |
|----------|--------------|----------------|-----------------------|---------------|
| 23       | Donald Trump | (250) 911-1234 | donaldtrump@gmail.com | Not Available |
| 111      | Donald Trump | (250) 911-1234 | donaldtrump@gmail.com | Not Available |

End of list

Figure 18.8: UCSSF-01 Alternate 2b: UI Screen 3 – Search by Email Results Screen

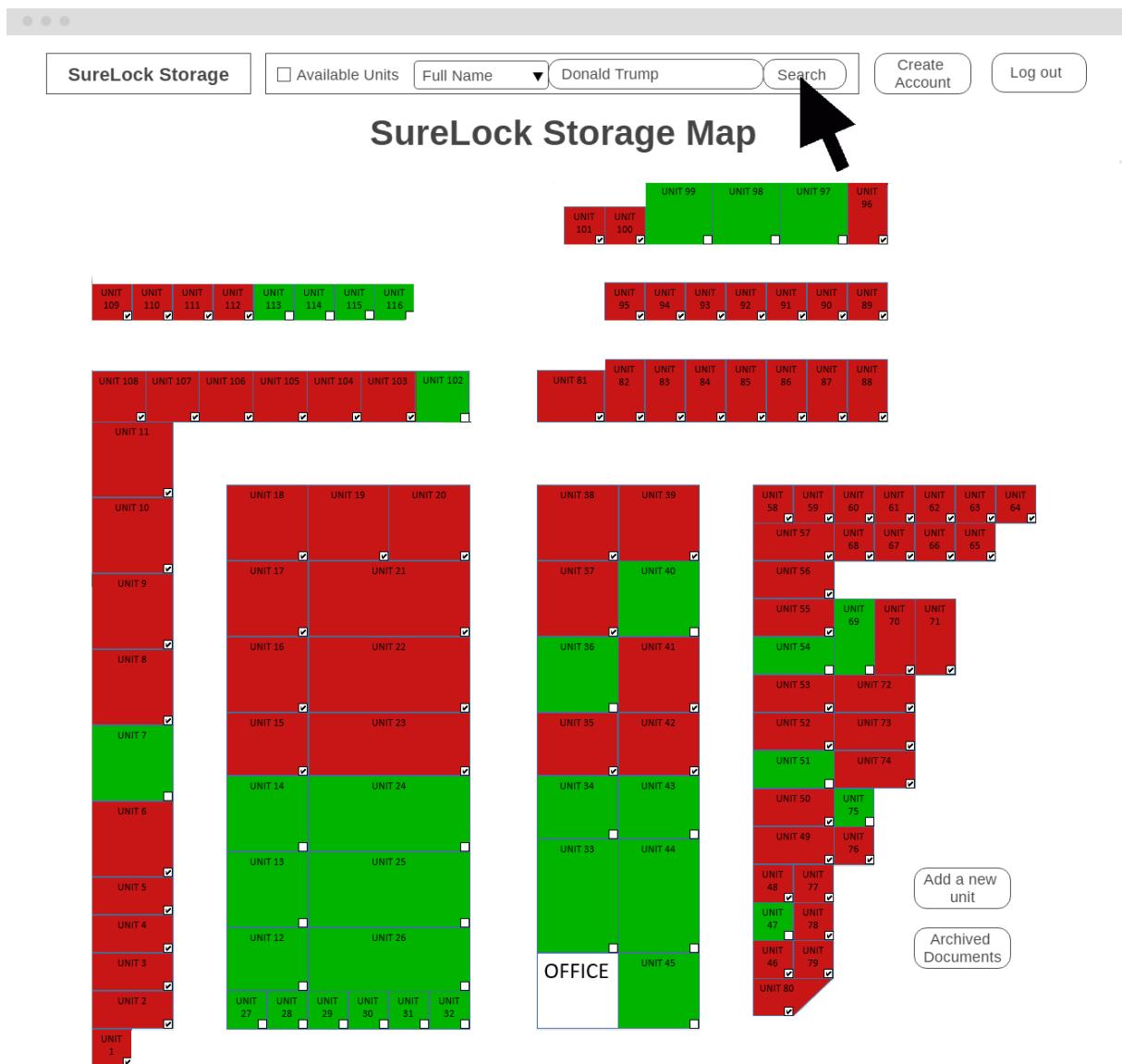


Figure 18.9: UCSSF-01 UI Screen 3 – Search by Full Name Screen

The screenshot shows a search results page for 'Donald Trump'. At the top, there are navigation icons and a header bar with the title 'SureLock Storage'. Below the header is a search bar with dropdown menus for 'Available Units' and 'Full Name' containing 'Donald Trump', a 'Search' button, and a 'Log out' button. The main content area is titled 'Search Results' and displays a table with two rows of unit information. The columns are 'Unit No.', 'Full Name', 'Phone Number', 'Email', and 'Availability'. The first row has Unit No. 23, Full Name Donald Trump, Phone Number (250) 911-1234, Email donaldtrump@gmail.com, and Availability Not Available. The second row has Unit No. 111, Full Name Donald Trump, Phone Number (250) 911-1234, Email donaldtrump@gmail.com, and Availability Not Available. At the bottom of the table, it says 'End of list'.

| Unit No. | Full Name    | Phone Number   | Email                 | Availability  |
|----------|--------------|----------------|-----------------------|---------------|
| 23       | Donald Trump | (250) 911-1234 | donaldtrump@gmail.com | Not Available |
| 111      | Donald Trump | (250) 911-1234 | donaldtrump@gmail.com | Not Available |

*Figure 18.10: UCSSF-01 UI Screen 4 – Search by Full Name Results Screen*

The screenshot shows the 'Unit Information' screen for Unit 111. At the top, there are navigation icons and a header bar with the title 'Unit Information'. Below the header is a search bar with dropdown menus for 'Feb 26, 2019', 'Credit', '\$50', and a 'Log out' button. The main content area displays various details about the unit: Unit number: 111, Current balance: \$660, Unit dimensions: 5'x5'x8', Last Payment: (dropdown menu), Unit availability: Not available, Unit rent cost: \$110 per month, Full name: Donald Trump, Email: donaldtrump@gmail.com, Phone: (250) 911-1234, Annotation: Also renting unit 23, and a link to 'See full transaction history' and 'Transaction Document'. At the bottom, there are 'Edit' and 'Close' buttons.

*Figure 18.11: UCSSF-01 UI Screen 5 – Unit Information Screen*

The user selects to search by full name and enters a client's full name in the search bar on top of the facility map screen. The system displays one or more units with the name entered in the search bar. The user selects the desired unit, which directs the user to the unit information

screen of the selected unit. The user may search the units by client's phone number or email as well so long as the user has selected to search by phone number or email, respectively.

### Use Case UCSSF-02: Search by Unit Information

Actors: Administrators and staff members

Precondition: The user has logged in under a valid account

Steps:

1. The user selects the searching feature
2. The user selects to search by unit number and enters a unit number
3. The system displays one or more units with the matching unit number
4. The user selects the desired unit and views the unit information

Success Condition: The desired unit information is displayed to the user

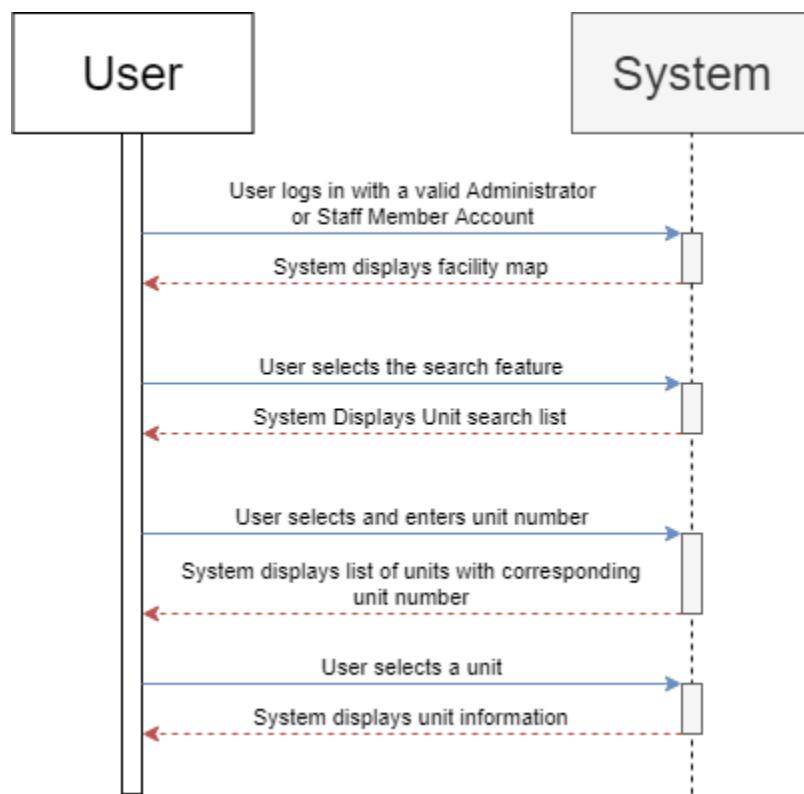


Figure 19: UCSSF-02 Sequence Diagram

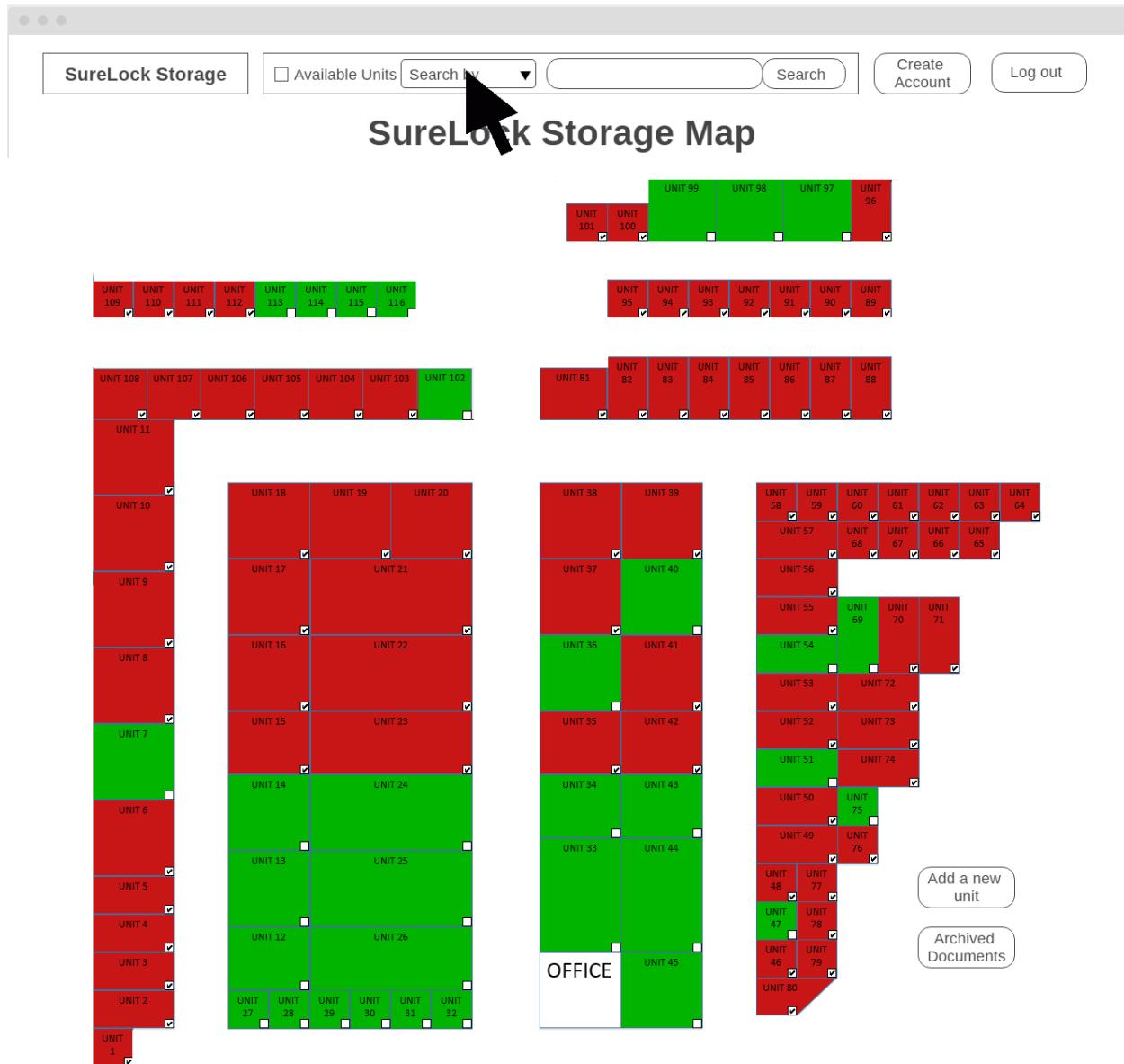


Figure 19.1: UCSSF-02 UI Screen 1 – Facility Map Screen



Figure 19.2: UCSSF-02 UI Screen 2 – Search by Unit Number Screen



Figure 19.3: UCSSF-02 UI Screen 3 – Search by Unit Number Screen

SureLock Storage

Available Units Unit Number ▼ 1 Search Log out

## Search Results

| Unit No. | Full Name       | Phone Number   | Email                 | Availability  |
|----------|-----------------|----------------|-----------------------|---------------|
| 1        | Virtual Self    | (250) 344-3514 | OwO@gmail.com         | Not Available |
| 11       | LCD Soundsystem | (250) 321-3123 | danceurself@gmail.com | Not Available |
| 15       | Mat Zo          | (250) 332-4564 | deepinside@gmail.com  | Not Available |
| 16       | Calvin Harris   | (250) 101-2344 | feelsoclose@gmail.com | Not Available |
| 17       | Danny Harle     | (250) 534-5193 | Me4U@gmail.com        | Not Available |
| 18       | Porter Robinson | (250) 344-3514 | UwU@gmail.com         | Not Available |
| 19       | Shiba San       | (250) 994-1233 | alline@gmail.com      | Not Available |
| 21       | Joel Zimmerman  | (250) 839-1343 | deadmau5@gmail.com    | Not Available |

1 2 3 Next

Figure 19.4: UCSSF-02 UI Screen 4 – Search Results Screen

SureLock Storage

## Unit Information

Log out

Unit number: 1

Current balance: \$150

Unit dimensions: 5'x5'x8'

Last Payment:

Unit availability: Not available

Unit rent cost: \$150 per month

Full name: Virtual Self

See full transaction history

Email: OwO@gmail.com

Transaction Document

Phone: (250) 344-3514

Annotation:

-

Edit Close

Figure 19.5: UCSSF-02 UI Screen 5 – Unit Information Screen

The user selects to search by unit number and enters the unit number in the search bar on top of the facility map screen. The system displays one or more units with that match the inputted

unit number. The user selects a specific unit from the list, and the user is directed to the unit information screen of the selected unit.

### Use Case UCSSF-03: Filter by Availability

Actors: Administrators and staff members

Precondition: The user has logged in under a valid account

Steps:

1. The user selects the searching feature
2. The user sets the filter to available units only
3. The system displays a list of each available unit
4. The user selects the desired unit

Success Condition: The desired unit information is displayed to the user

Alternate Path: 2a) The user filters for not available units. The system displays a list of each not available unit.

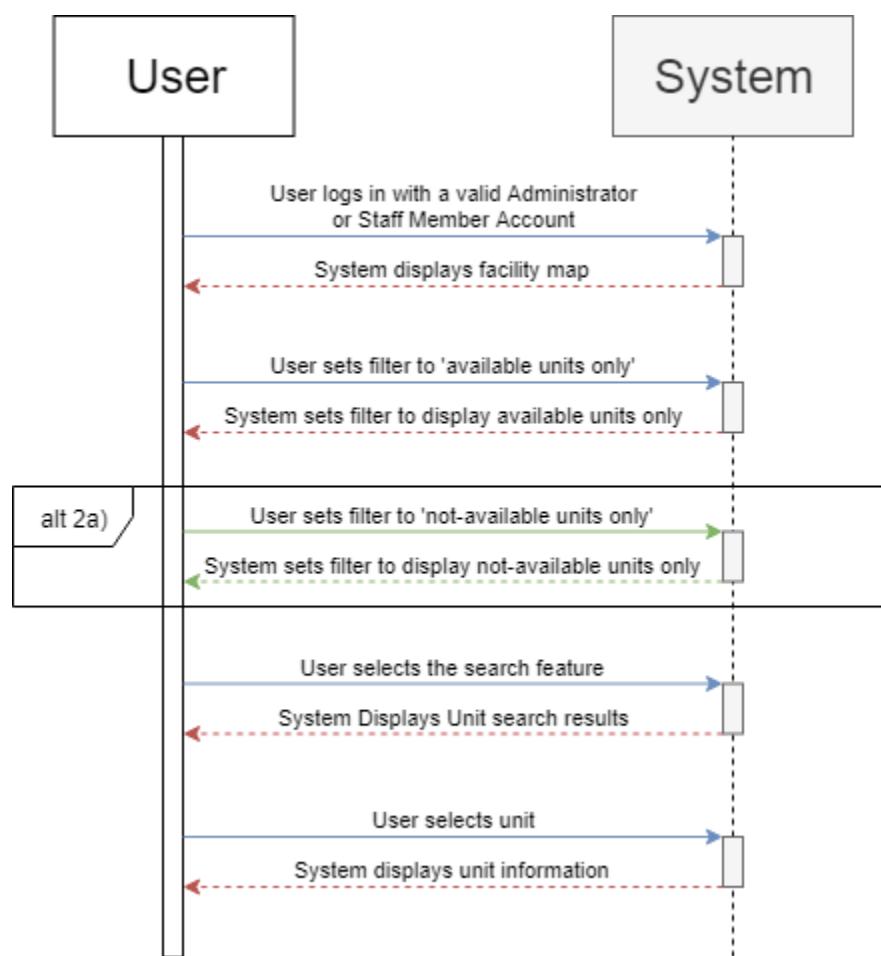


Figure 20: UCSSF-03 Sequence Diagram



Figure 20.1: UCSSF-03 UI Screen 1 – Available Units Search Screen

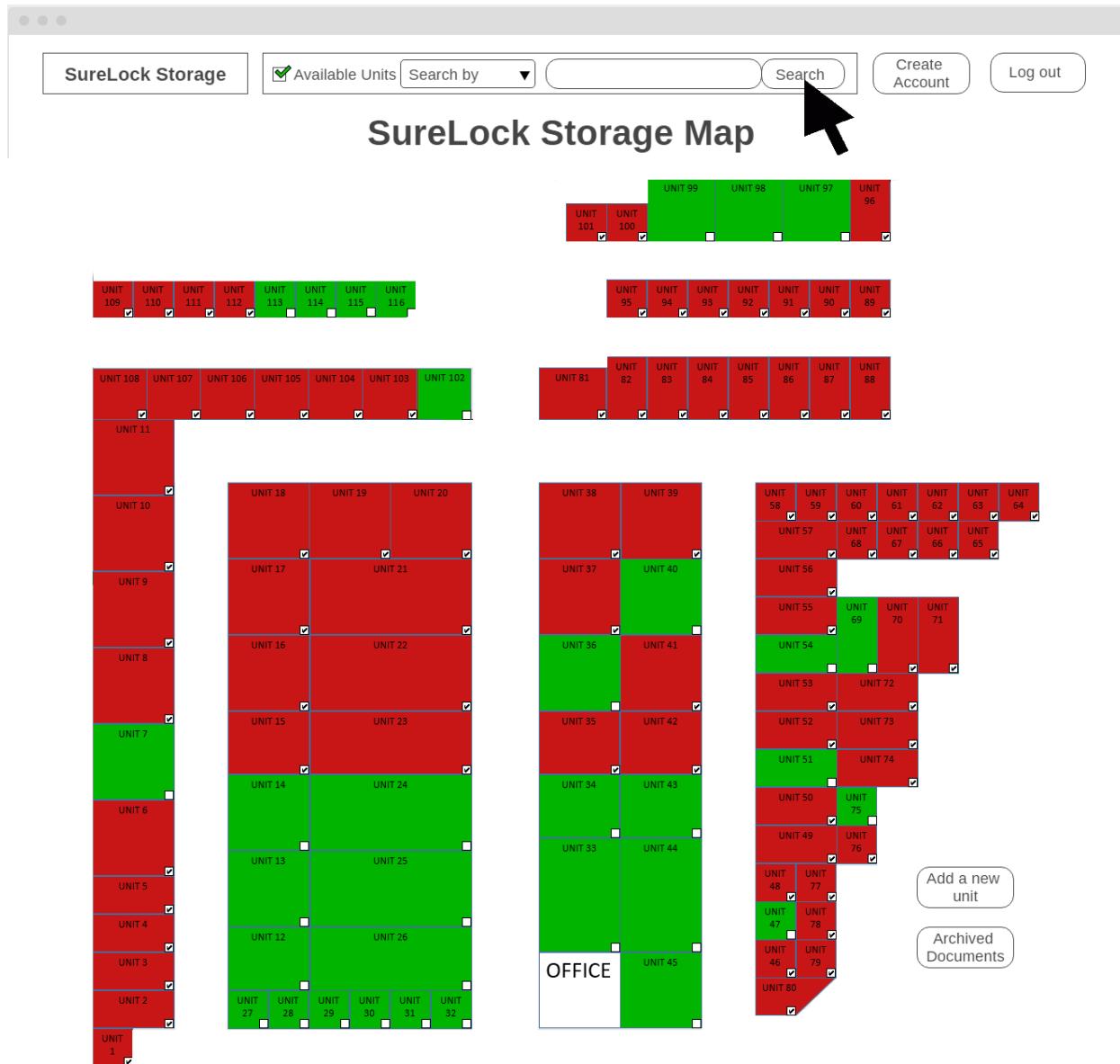


Figure 20.2: UCSSF-03 UI Screen 2 – Available Units Checked Search Screen

SureLock Storage

Available Units

Search by ▾

Search

Log out

## Search Results

| Unit No. | Full Name | Phone Number | Email | Availability |
|----------|-----------|--------------|-------|--------------|
| 7        | —         | —            | —     | Available    |
| 12       | —         | —            | —     | Available    |
| 13       | —         | —            | —     | Available    |
| 14       | —         | —            | —     | Available    |
| 24       | —         | —            | —     | Available    |
| 25       | —         | —            | —     | Available    |
| 26       | —         | —            | —     | Available    |
| 27       | —         | —            | —     | Available    |

123 Next

Figure 20.3: UCSSF-03 UI Screen 3 – Available Units Search Screen

SureLock Storage

Available Units

Search by ▾

Search

Log out

## Search Results

| Unit No. | Full Name       | Phone Number   | Email                   | Availability  |
|----------|-----------------|----------------|-------------------------|---------------|
| 1        | Virtual Self    | (250) 344-3514 | OwO@gmail.com           | Not Available |
| 2        | LCD Soundsystem | (250) 321-3123 | danceyourself@gmail.com | Not Available |
| 3        | Mat Zo          | (250) 332-4564 | deepinside@gmail.com    | Not Available |
| 4        | Calvin Harris   | (250) 101-2344 | feelsoclose@gmail.com   | Not Available |
| 5        | Danny Harle     | (250) 534-5193 | Me4U@gmail.com          | Not Available |
| 6        | Porter Robinson | (250) 344-3514 | UwU@gmail.com           | Not Available |
| 8        | Shiba San       | (250) 994-1233 | allineed@gmail.com      | Not Available |
| 9        | Joel Zimmerman  | (250) 839-1343 | deadmau5@gmail.com      | Not Available |

12345678910 Next

Figure 20.4: UCSSF-03 Alternate 2a: UI Screen 1 – Unavailable Units Search Screen

The screenshot shows a web-based application window titled "Unit Information". In the top left corner, there is a logo for "SureLock Storage". On the right side, there is a "Log out" button. The main content area displays the following information:

- Unit number: 7
- Unit dimensions: 5'x 5 'x8'
- Unit availability: Available
- Unit rent cost: \$300 per month
- Full name: -
- Email: -
- Phone: -
- Annotation:  
-
- Current balance: \$300
- Last Payment:  
[A dropdown menu showing a single item: "See full transaction history"]
- [A button labeled "Transaction Document" with a red border]

At the bottom of the screen, there are two buttons: "Edit" and "Close".

*Figure 20.5: UCSSF-03 UI Screen 4 – Available Units Info Screen*

The user clicks on the checkbox by the search bar. By clicking on the checkbox next to “Available Units”, the system displays the list of currently available units. For the alternate path, the system would display the list of unavailable units if the user does not click on the checkbox.

#### **Use Case UCSSF-04: Search for Archived Transaction Documents**

Actors: Administrators

Precondition: The user has logged in under an Administrator account

Steps:

1. The user selects the Archived Documents search feature
2. The user selects to search by unit number
3. The user enters the unit number associated with the desired transaction document
4. The system displays one or more transaction documents that match the inputted information

Success Condition: The desired transaction document is downloaded

Alternate Paths:

- 2a) The user selects to search by file name. The user enters a file name
- 2b) The user selects to search by full name. The user enters the full name of the client associated with the desired transaction document

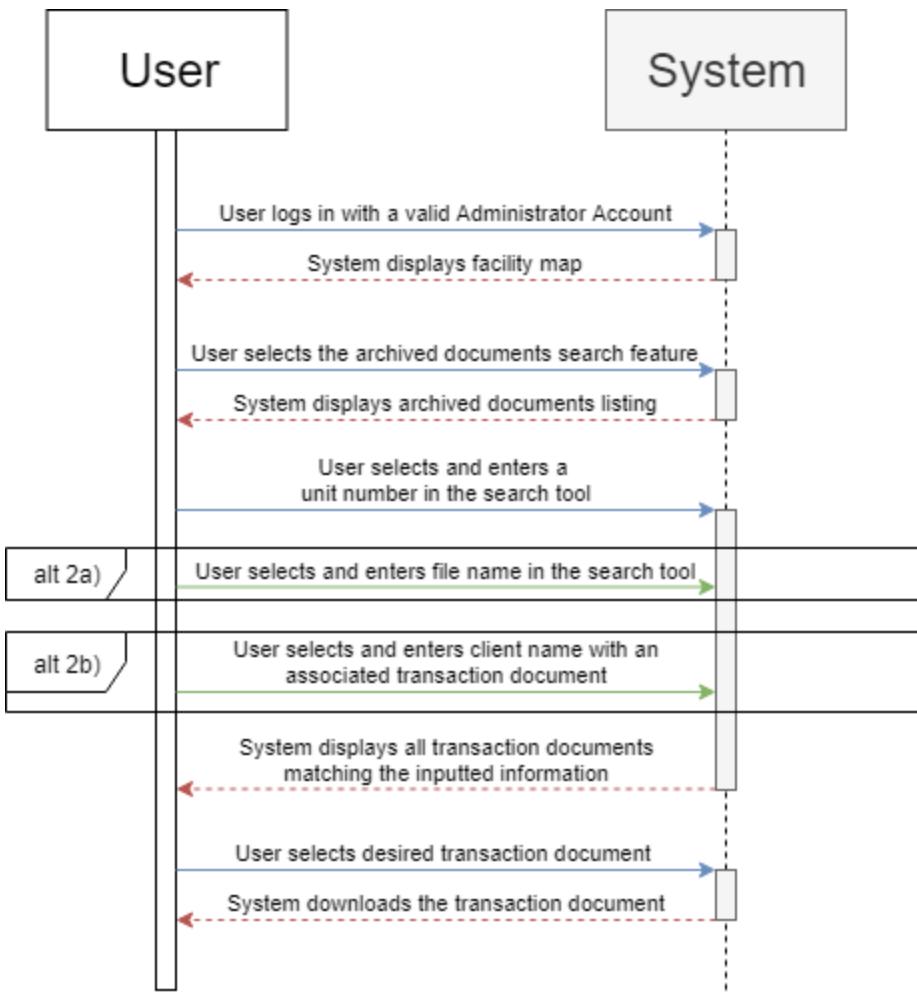


Figure 21: UCSSF-04 Sequence Diagram



Figure 21.1: UCSSF-04 UI Screen 1 – Facility Map Screen

SureLock Storage

Search by ▼

Archived Documents

| Unit No. | Full Name        | File Name    | Date of Creation | File Size |
|----------|------------------|--------------|------------------|-----------|
| 8        | Sophie Turner    | sturner.pdf  | Jan9, 2008       | 24.02 KB  |
| 95       | Camila Cabello   | ccabello.pdf | Mar20, 2009      | 25KB      |
| 82       | George Miller    | oji.pdf      | Jun30, 2009      | 17.08KB   |
| 34       | Harry Potter     | hpotter.pdf  | Dec1, 2013       | 23.5KB    |
| 38       | Ali Wong         | awong.pdf    | Sep14, 2014      | 18.2KB    |
| 20       | Rich Brian       | rbrian.pdf   | Nov1, 2015       | 21.3KB    |
| 57       | Gabriel Iglesias | fluffy.pdf   | Oct9, 2015       | 22KB      |
| 102      | Joseph Brando    | zawarudo.pdf | Jan14, 2019      | 1.2MB     |

1 2 3 4 Next

Figure 21.2: UCSSF-04 UI Screen 2 – Archived Documents Screen

SureLock Storage

Search by ▼

Archived Documents

| Unit No. | Full Name        | File Name    | Date of Creation | File Size |
|----------|------------------|--------------|------------------|-----------|
| 8        | Sophie Turner    | sturner.pdf  | Jan9, 2008       | 24.02 KB  |
| 95       | Camila Cabello   | ccabello.pdf | Mar20, 2009      | 25KB      |
| 82       | George Miller    | oji.pdf      | Jun30, 2009      | 17.08KB   |
| 34       | Harry Potter     | hpotter.pdf  | Dec1, 2013       | 23.5KB    |
| 38       | Ali Wong         | awong.pdf    | Sep14, 2014      | 18.2KB    |
| 20       | Rich Brian       | rbrian.pdf   | Nov1, 2015       | 21.3KB    |
| 57       | Gabriel Iglesias | fluffy.pdf   | Oct9, 2015       | 22KB      |
| 102      | Joseph Brando    | zawarudo.pdf | Jan14, 2019      | 1.2MB     |

1 2 3 4 Next

Figure 21.3: UCSSF-04 UI Screen 3 – Archived Documents Screen with Dropdown

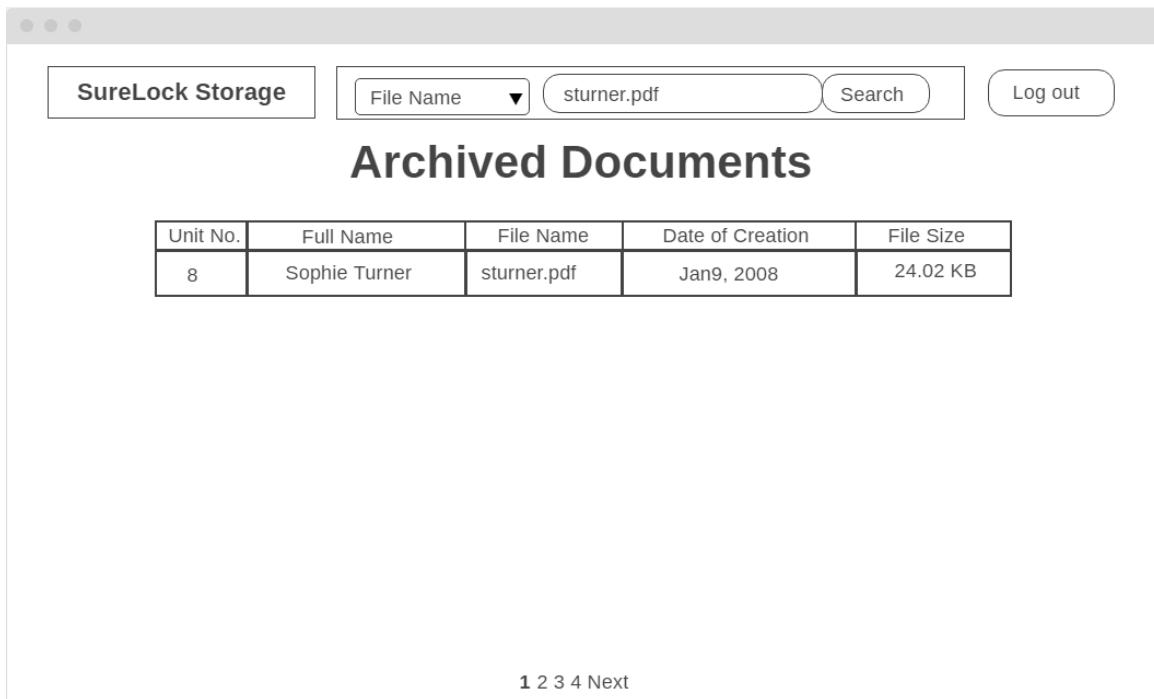


Figure 21.4: UCSSF-04 Alternate 2a: UI Screen 1 – Archived Documents Screen with Search Results

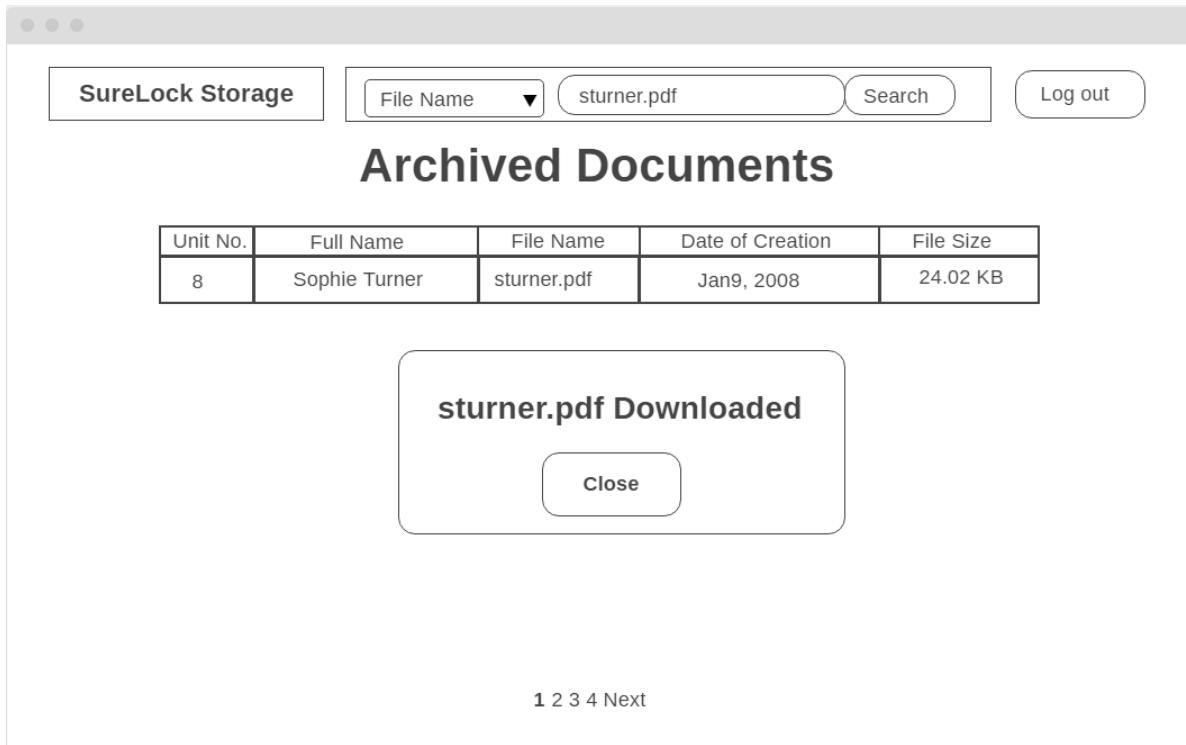


Figure 21.5: UCSSF-04 Alternate 2a: UI Screen 2 – Archived Documents Screen with File Name Search Name Results Downloaded

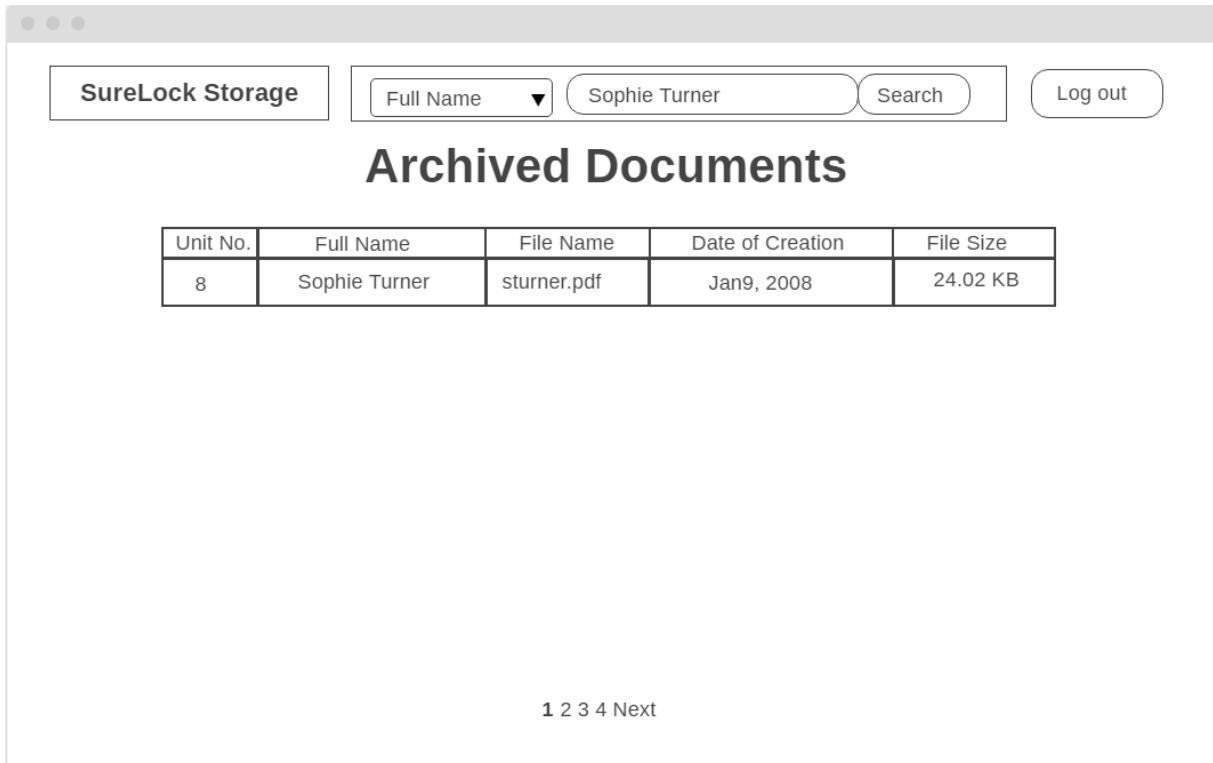


Figure 21.6: UCSSF-04 UI Alternate 2b: UI Screen 1 – Archived Documents Screen with Search Results

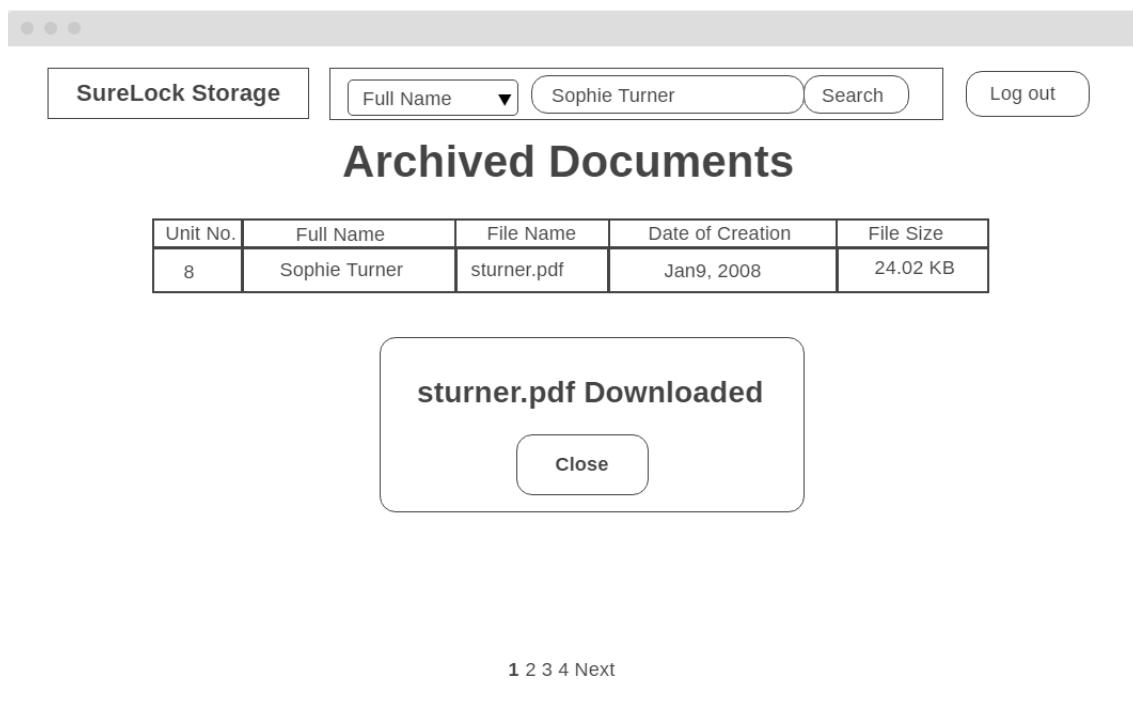


Figure 21.7: UCSSF-04 Alternate 2b: UI Screen 2 – Archived Documents Screen with Full Name Search Name Results Downloaded

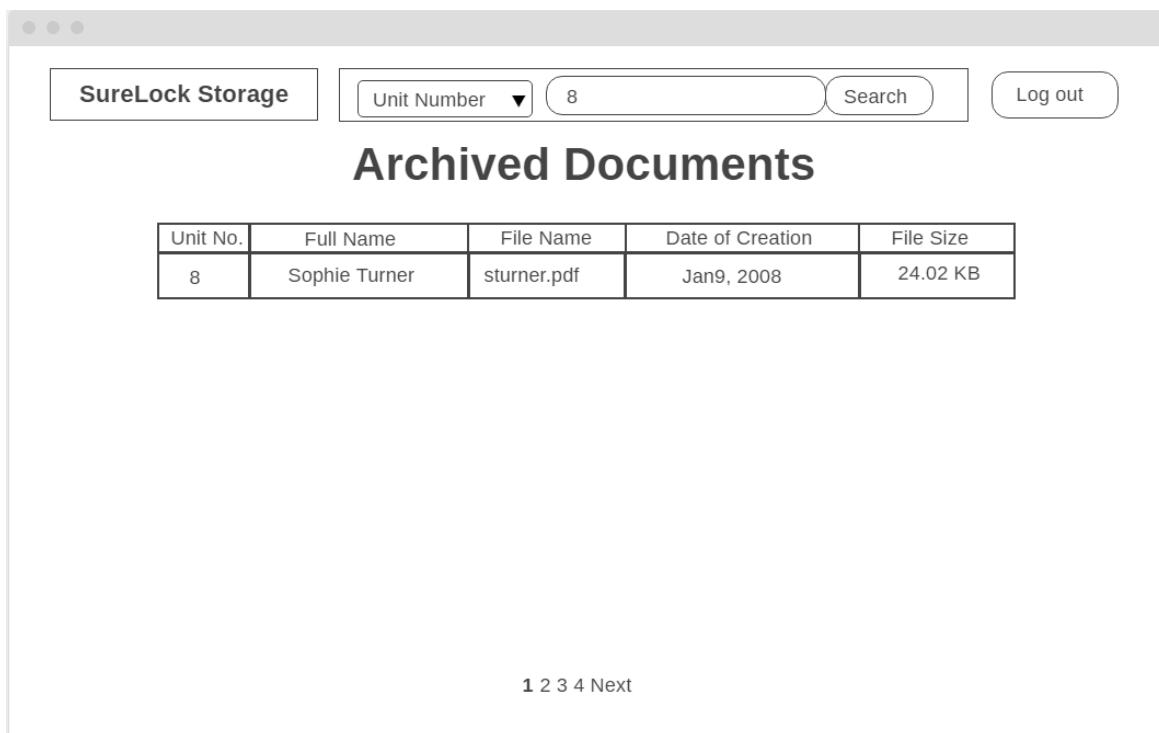


Figure 21.8: UCSSF-04 UI Screen 4 – Archived Documents Screen with Search Results by Unit Number

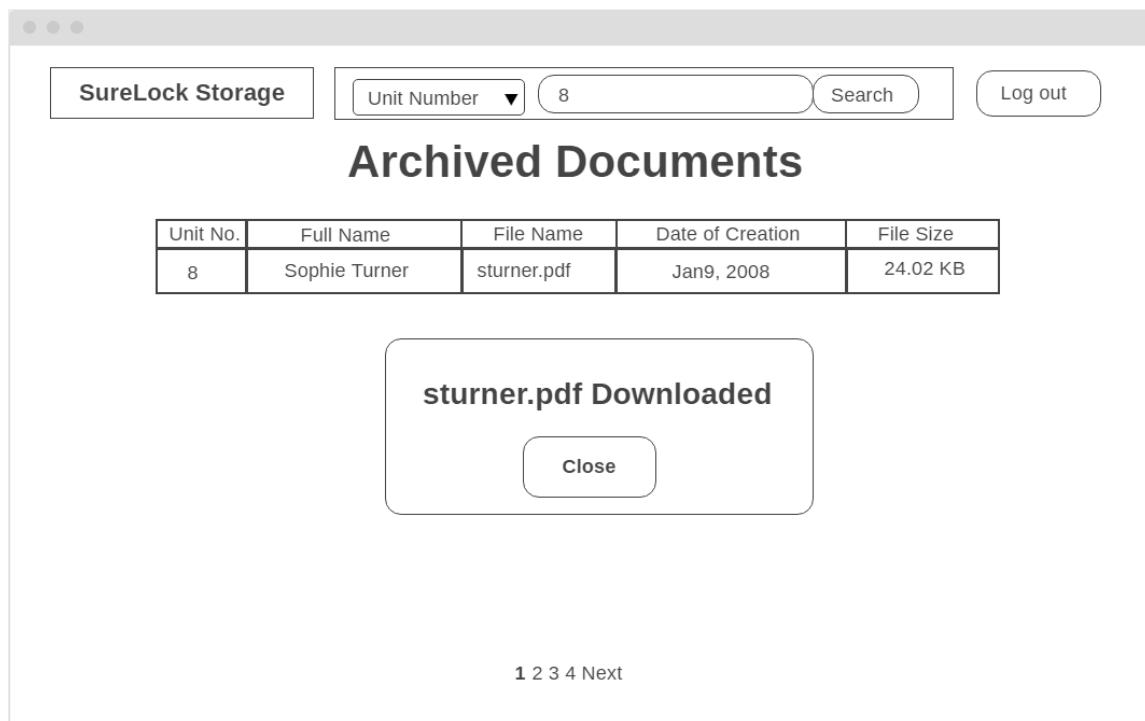


Figure 21.9: UCSSF-04 UI Screen 5 – Archived Documents Screen with Search Results by Unit Number Downloaded

The user clicks on the “Archived Documents” button on the facility map screen. The user is directed to the archived documents screen where they can search a unit number, a file name, or the full name of the client associated with the transaction document. The user selects to search by unit number, enters a unit number, and clicks “Search”. The system displays a list of one or more transaction documents that match the entered unit number.

## 7.4 Use Case Model

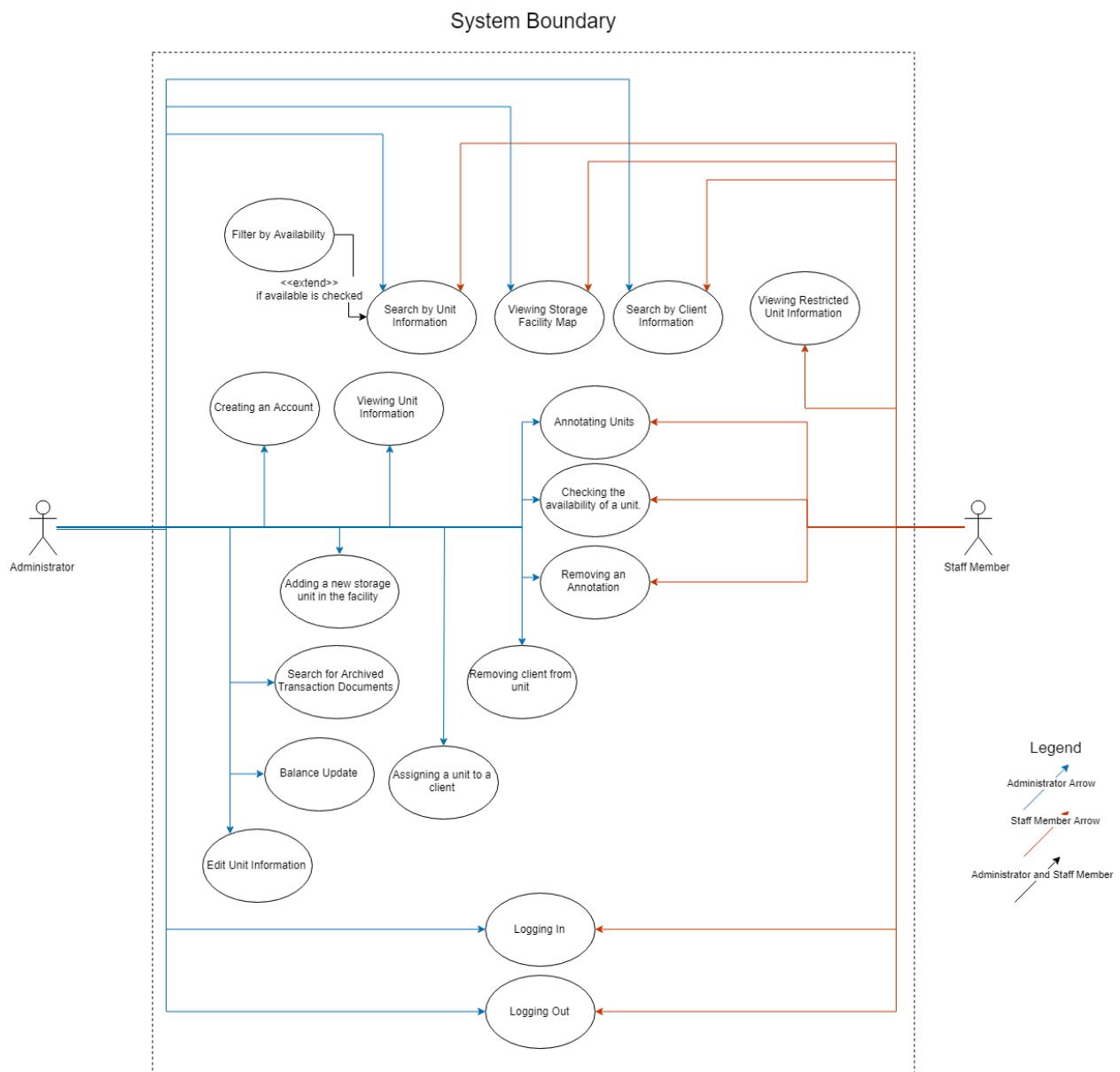


Figure 22: Use Case Model

## 7.5 Traceability Matrices

| Project Name: SureLock Storage Management System |                              |                  |  |          |               |  |
|--|------------------------------|------------------|--|----------|---------------|--|
| Features   |                              | Requirements     |  |          | Test Cases    |  |
| Feature #  | Feature Name                 | Requirement ID # | Requirement Description  | Priority | Test Case ID# | Test Case Description  |
| 3.1  | Storage Facility Information | REQ-SFI-01       | Each Staff Member and Administrator must be able to view a map of the storage facility with the location of each unit. | High     | TC-SFI-01.1   | Log in and verify that the map is viewable with an Administrator account.  |
|  |                              |                  |  |          | TC-SFI-01.2   | Log in and verify that the map is viewable with a Staff Member account.  |
|  |                              | REQ-SFI-02       | Each storage unit on the map must have a link to that unit's information.  | High     | TC-SFI-02.1   | Select an arbitrary unit from the facility map and verify that the unit information is displayed on an Administrator Account.  |
|  |                              |                  |  |          | TC-SFI-02.2   | Select a different unit than the one selected in TC2.1 from the facility map and verify that the unit information is displayed on a Staff Member Account.  |
|  |                              | REQ-SFI-03       | Each storage unit's availability must be identifiable and displayed  | High     | TC-SFI-03.1   | Select a unit on the facility map that is coloured green. Verify that the box in the corner of the unit on the UI is not checked and that the unit availability is set to 'available' within the unit information. |

|     |                          |            |   |        |             |  |
|-----|--------------------------|------------|---|--------|-------------|--|
|     |                          |            |   |        | TC-SFI-03.2 | Select a unit on the facility map that is coloured red. Verify that the box in the corner of the unit on the UI is checked and that the unit availability is set to 'not available' within the unit information. |
|     |                          | REQ-SFI-04 | Administrator must be able to assign a client to an available unit  | High   | TC-SFI-04.1 | Follow the steps of UCSFI-02 to assign a unit to a client. Verify that the unit has been assigned a client. Verify that the unit is set to 'not available' via TC-SFI-03.2.                                      |
|     |                          | REQ-SFI-05 | Each Administrator must be able to remove a client from a unit, which will set the unit to available.                     | High   | TC-SFI-05.1 | Follow the steps of UCSFI-05. Verify that the client has been removed from the unit in the unit information. Verify that the unit is set to 'available' via TC-SFI-03.1.   |
|     |                          | REQ-SFI-06 | Each Administrator must be able to add additional units, which will automatically update the map mentioned in REQ-SFI-01. | High   | TC-SFI-06.1 | Follow the steps of UCSFI-04. Verify that the newly created unit is visible on the facility map and that selecting the unit allows the user to view the correct unit information.                                |
| 3.2 | Storage Unit Information | REQ-SUI-01 | Administrator must be able to view unit information   | High   | TC-SUI-01.1 | Verify all the unit information listed in REQ-SUI-01 is viewable from an Administrator account.  |
|     |                          | REQ-SUI-02 | Each Staff Member   | Medium | TC-SUI-02.1 | Verify the information listed in   |

|  |  |            |  |      |             |   |
|--|--|------------|--|------|-------------|---|
|  |  |            | must be able to view restricted unit information   |      |             | REQ-SUI-02 is viewable from a Staff Member account.   |
|  |  |            |  |      | TC-SUI-02.2 | Verify that the sensitive client information (transaction documents, current balance, and payment information) is not viewable on the unit information from a Staff Member account. |
|  |  | REQ-SUI-03 | Administrator must be able to edit unit information  | High | TC-SUI-03.1 | Verify that all Administrator accounts have access to the editable unit information screen  |
|  |  |            |  |      | TC-SUI-03.2 | Verify that all Staff Member accounts do not have access to the editable unit information screen.   |
|  |  |            |  |      | TC-SUI-03.3 | Follow the steps of UCSUI-06. Verify that all Administrator accounts can edit the unit information specified in REQ-SUI-03 and that the information is successfully updated.        |
|  |  | REQ-SUI-04 | Each Staff Member and Administrator must be able to add and edit annotations on the unit information | Low  | TC-SUI-04.1 | Follow the steps of UCSUI-03. Verify that an annotation has successfully been added to the unit information.  |
|  |  |            |  |      | TC-SUI-04.2 | Follow the steps of UCSUI-04. Verify  |

|     |                          |            |  |        |             |   |
|-----|--------------------------|------------|--|--------|-------------|---|
|     |                          |            |  |        |             | that the annotation has successfully been removed from the unit information.  |
|     |                          | REQ-SUI-05 | Each Administrator must be able to upload and delete transaction documents associated with specific units.                                 | Medium | TC-SUI-05.1 | Follow the steps of UCSUI-05 until the alternate path is reached. Follow the alternate path and refer to the corresponding UI model. Verify that the transaction document has been successfully uploaded.   |
|     |                          |            |  |        | TC-SUI-05.2 | Remove a transaction document from the unit which a document was uploaded to in TC-SUI-05.1. Verify that the document has been successfully deleted.  |
| 3.3 | System Searching Feature | REQ-SSF-01 | Staff Member and Administrator must be able to search for a unit by the Full Name, Email, Phone Number, Unit Number, and Unit Availability | High   | TC-SSF-01.1 | Select 'search by Full Name' from the dropdown list next to the search bar and enter a client's name. Verify that the system displays each unit with a client full name that matches the entered name and that clicking on a specific unit opens the "Unit Information" page of that specific unit. |
|     |                          |            |  |        | TC-SSF-01.2 | Select 'search by Email' from the dropdown list next to the search bar and enter client's   |

|  |  |  |  |  |             |  |
|--|--|--|--|--|-------------|--|
|  |  |  |  |  |             | email. Verify that the system displays each unit with an email that matches the entered email and that clicking on a specific unit opens the “Unit Information” page of that specific unit.  |
|  |  |  |  |  | TC-SSF-01.3 | Select ‘search by Phone Number’ from the dropdown list next to the search bar and enter client’s phone number. Verify that the system displays each unit with a number that matches the entered phone number and that clicking on a specific unit opens the “Unit Information” page of that specific unit. |
|  |  |  |  |  | TC-SSF-01.4 | Select ‘search by Unit Number’ from the dropdown list next to the search bar and enter a unit number. Verify that the system displays each unit with a unit number that matches the entered unit number and that clicking on a specific unit opens the “Unit Information” page of that specific unit.      |
|  |  |  |  |  | TC-SSF-01.5 | Check the “Available Units” box beside the searching bar and verify that the   |

|     |                            |            |   |        |             |  |
|-----|----------------------------|------------|---|--------|-------------|--|
|     |                            |            |   |        |             | system displays each available unit.   |
|     |                            | REQ-SSF-02 | Administrator must be able to search the archived transaction documents by File Name, Associated Unit Number, and Associated Clients Name | Medium | TC-SSF-02.1 | Follow the steps of UCSSF-04. Verify that the desired transaction document can be accessed and downloaded.                     |
| 3.4 | Account Management Feature | REQ-AMF-01 | Staff Member and Administrator must enter a unique username and password to sign into their personal account                              | Medium | TC-AMF-01.1 | Verify that an Administrator cannot log in to the system without first entering their unique username and password.            |
|     |                            |            |   |        | TC-AMF-01.2 | Verify that a Staff Member cannot log in to the system without first entering their unique username and password               |
|     |                            |            |   |        | TC-AMF-01.3 | Verify that there are no duplicate usernames for activated accounts in the system  |
|     |                            | REQ-AMF-02 | Each Staff Member and Administrator must be able to log out of their account.   | High   | TC-AMF-02.1 | Follow the steps of UCAM-02 with an Administrator account. Verify that Administrator is successfully logged out of the system. |
|     |                            |            |   |        | TC-AMF-02.2 | Follow the steps of UCAM-02 with a Staff Member account. Verify that   |

|     |                     |            |  |      |             |  |
|-----|---------------------|------------|--|------|-------------|--|
|     |                     |            |  |      |             | Staff Member is successfully logged out of the system.   |
|     |                     | REQ-AMF-03 | Each Administrator must be able to create an Administrator account and a Staff Member account with a unique username and password. | High | TC-AMF-03.1 | Follow the steps of UCAM-03 to create a new Staff Member account. Verify that the Staff Member account is created successfully.                      |
|     |                     |            |  |      | TC-AMF-03.2 | Follow the steps of UCAM-03 to create a new Administrator account. Verify that the Administrator account is created successfully.                    |
| 4.1 | Software Interfaces | REQ-EI-01  | Each Administrator must be able to import and export Microsoft Excel documents   | Low  | TC-EI-01.1  | Upload a Microsoft Excel document to the system and verify the data uploaded matches the data in the original Microsoft Excel document               |
|     |                     |            |  |      | TC-EI-01.2  | Download an archived document from the system, open the document and verify if the data in the downloaded document is in Excel format and is correct |
|     |                     | REQ-EI-02  | Each Staff Member and Administrator must be able to operate the system in Microsoft  | High | TC-EI-02.1  | Verify opening the system in Microsoft Windows 7, logging in as an Administrator, creating a new unit and downloading                                |

|     |                             |           |  |        |            |  |
|-----|-----------------------------|-----------|--|--------|------------|--|
|     |                             |           | Windows 7,<br>8, 8.1, or 10  |        |            | an archived<br>document  |
|     |                             |           |  |        | TC-EI-02.2 | Verify opening the<br>system in Microsoft<br>Windows 8, logging<br>in as an<br>Administrator,<br>creating a new unit<br>and downloading<br>an archived<br>document   |
|     |                             |           |  |        | TC-EI-02.3 | Verify opening the<br>system in Microsoft<br>Windows 8.1,<br>logging in as an<br>Administrator,<br>creating a new unit<br>and downloading<br>an archived<br>document |
|     |                             |           |  |        | TC-EI-02.4 | Verify opening the<br>system in Microsoft<br>Windows 10,<br>logging in as an<br>Administrator,<br>creating a new unit<br>and downloading<br>an archived<br>document  |
| 5.1 | Performance<br>Requirements | REQ-NF-01 | Searching for<br>a storage unit<br>in the system<br>should take<br>fewer than 5<br>seconds | Medium | TC-NF-01.1 | Verify search by<br>“Unit Number”<br>takes less than 5<br>seconds  |
|     |                             |           |  |        | TC-NF-01.2 | Verify search by<br>“Full Name” takes<br>less than 5<br>seconds  |
|     |                             |           |  |        | TC-NF-01.3 | Verify search by<br>“Phone Number”<br>takes less than 5<br>seconds   |
|     |                             |           |  |        | TC-NF-01.4 | Verify search by<br>“Email” takes less<br>than 5 seconds   |
|     |                             | REQ-NF-02 | Opening the<br>system  | Medium | TC-NF-02.1 | Verify that opening<br>the system in a   |

|     |                       |           |  |        |            |  |
|-----|-----------------------|-----------|--|--------|------------|--|
|     |                       |           | should take no more than 1 minute  |        |            | browser and logging in takes less than 1 minute  |
|     |                       | REQ-NF-03 | Processing new clients or storage units in the system should take within 5 seconds                           | Medium | TC-NF-03.1 | Verify saving takes less than 5 seconds after a new unit is assigned to a client   |
|     |                       |           |  |        | TC-NF-03.2 | Verify saving takes less than 5 seconds after adding a new storage unit in the facility map  |
|     |                       | REQ-NF-04 | Each map must support the display of at least 500 storage units  | High   | TC-NF-04.1 | Verify that up to 500 storage units can be added to the facility map. Apply boundary value analysis and equivalence partitioning techniques with this value. |
|     |                       | REQ-NF-05 | At least five users must be able to simultaneously use the system  | Medium | TC-NF-05.1 | Verify that the system is usable with 5 simultaneous users by performing other test cases concurrently. Ensure that the system does not crash.               |
| 5.2 | Security Requirements | REQ-NF-06 | Staff Member and Administrator must enter a unique username and password to sign into their personal account | Medium | TC-NF-06.1 | Verify that an Administrator cannot log in to the system without first entering their unique username and password   |
|     |                       |           |  |        | TC-NF-06.2 | Verify that a Staff Member cannot log  |

|  |  |           |   |      |            |   |
|--|--|-----------|---|------|------------|---|
|  |  |           |   |      |            | in to the system without first entering their unique username and password  |
|  |  |           |   |      | TC-NF-06.3 | Verify that there are no duplicate usernames for activated accounts in the system   |
|  |  | REQ-NF-07 | Passwords must not be viewable by default   | High | TC-NF-07.1 | Enter the password on the logging in page and verify that the password is not visible while entering  |
|  |  | REQ-NF-08 | Administrator account must not be restricted from any information in the system   | High | TC-NF-08.1 | Open the "Unit Information" page of a specific unit and verify that all of the categories listed in REQ-SUI-01 are viewable on an Administrator account |
|  |  | REQ-NF-09 | Unit information pertaining to a specific client must be automatically deleted 2 years after the client pays off debts and ceases renting units | High | TC-NF-09.1 | Check that there is no unit information available after 2 years has elapsed since a client ceased renting a unit.                                       |
|  |  | REQ-NF-10 | Administrator with an existing account must be able to create a new Staff Member or Administrator account                                       | High | TC-NF-10.1 | Check that each Administrator account is able to create new accounts  |

|     |                             |           |   |        |            |  |
|-----|-----------------------------|-----------|---|--------|------------|--|
|     |                             | REQ-NF-11 | Administrator must have access to a list of each Staff Member and Administrator Account password                        | Medium | TC-NF-11.1 | Check that each Administrator account is able to view a list of passwords                                      |
| 5.3 | Software Quality Attributes | REQ-NF-12 | The system should be manageable and maintainable by the IT team   | High   | TC-NF-12.1 | Verify that the IT team deems the system both manageable and maintainable                                      |
| 6   | Other Requirements          | REQ-NF-13 | The client information within the storage unit must be compliant with Alberta's Personal Information Protection Act [4] | Medium | TC-NF-13.1 | Consult with legal counsel to verify that the information is compliant with Alberta's Personal Information Act |

*Table 2. Full Traceability Matrix*

### 7.5.1 Storage Facility Information Matrix

| Systems<br>Feature 3.1:<br>Storage<br>Facility<br>Information | REQ-SFI-06 |   |   |   |   |   |
|---|------------|---|---|---|---|---|
| TC-SFI-01.1   | ✓          |   |   |   |   |   |
| TC-SFI-01.2   | ✓          |   |   |   |   |   |
| TC-SFI-02.1   |            | ✓ |   |   |   |   |
| TC-SFI-02.2   |            | ✓ |   |   |   |   |
| TC-SFI-03.1   |            |   | ✓ |   |   |   |
| TC-SFI-03.2   |            |   | ✓ |   |   |   |
| TC-SFI-04.1   |            |   |   | ✓ |   |   |
| TC-SFI-05.1   |            |   |   |   | ✓ |   |
| TC-SFI-06.1   |            |   |   |   |   | ✓ |

Table 3. Storage Facility Information Matrix

### 7.5.2 Storage Unit Information Matrix

| Systems<br>Feature 3.2:<br>Storage Unit<br>Information | REQ-SUI-05 |   |   |   |   |   |
|--|------------|---|---|---|---|---|
| TC-SUI-01.1  | ✓          |   |   |   |   |   |
| TC-SUI-02.1  |            | ✓ |   |   |   |   |
| TC-SUI-02.2  |            | ✓ |   |   |   |   |
| TC-SUI-03.1  |            |   | ✓ |   |   |   |
| TC-SUI-03.2  |            |   | ✓ |   |   |   |
| TC-SUI-03.3  |            |   | ✓ |   |   |   |
| TC-SUI-04.1  |            |   |   | ✓ |   |   |
| TC-SUI-04.2  |            |   |   | ✓ |   |   |
| TC-SUI-05.1  |            |   |   |   | ✓ |   |
| TC-SUI-05.2  |            |   |   |   |   | ✓ |

Table 4. Storage Unit Information Matrix

### 7.5.3 System Searching Feature Matrix

| Systems<br>Feature 3.3:<br>System<br>Searching<br>Feature | REQ-SSF-01 | REQ-SSF-02 |
|---|------------|------------|
| TC-SSF-01.1   | ✓          |            |
| TC-SSF-01.2   | ✓          |            |
| TC-SSF-01.3   | ✓          |            |
| TC-SSF-01.4   | ✓          |            |
| TC-SSF-01.5   | ✓          |            |
| TC-SSF-02.1   |            | ✓          |

Table 5. System Searching Feature Matrix

### 7.5.4 Account Management Feature Matrix

| Systems<br>Feature 3.4:<br>Account<br>Management<br>Feature | REQ-AMF-01 | REQ-AMF-02 | REQ-AMF-03 |
|---|------------|------------|------------|
| TC-AMF-01.1   | ✓          |            |            |
| TC-AMF-01.2   | ✓          |            |            |
| TC-AMF-01.3   | ✓          |            |            |
| TC-AMF-02.1   |            | ✓          |            |
| TC-AMF-02.2   |            | ✓          |            |
| TC-AMF-03.1   |            |            | ✓          |
| TC-AMF-03.2   |            |            | ✓          |

Table 6. Account Management Feature Matrix

### 7.5.5 External Interface Requirement Matrix

| External Interface Requirements |           |
|---------------------------------|-----------|
| REQ-EI-01                       | REQ-EI-02 |
| TC-EI-01.1                      | ✓         |
| TC-EI-01.2                      | ✓         |
| TC-EI-02.1                      | ✓         |
| TC-EI-02.2                      | ✓         |
| TC-EI-02.3                      | ✓         |
| TC-EI-02.4                      | ✓         |

Table 7. External Interface Requirements Matrix

### 7.5.6 Non-Functional Requirement Matrix

| Non-functional Requirements: Sections 5 and 6 | REQ-NF-13 | REQ-NF-12 | REQ-NF-11 | REQ-NF-10 | REQ-NF-09 | REQ-NF-08 | REQ-NF-07 | REQ-NF-06 | REQ-NF-05 | REQ-NF-04 | REQ-NF-03 | REQ-NF-02 | REQ-NF-01 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| TC-NF-01.1                                    | ✓         |           |           |           |           |           |           |           |           |           |           |           |           |
| TC-NF-01.2                                    | ✓         |           |           |           |           |           |           |           |           |           |           |           |           |
| TC-NF-01.3                                    | ✓         |           |           |           |           |           |           |           |           |           |           |           |           |
| TC-NF-01.4                                    | ✓         |           |           |           |           |           |           |           |           |           |           |           |           |
| TC-NF-02.1                                    |           | ✓         |           |           |           |           |           |           |           |           |           |           |           |
| TC-NF-03.1                                    |           |           | ✓         |           |           |           |           |           |           |           |           |           |           |
| TC-NF-03.2                                    |           |           | ✓         |           |           |           |           |           |           |           |           |           |           |
| TC-NF-04.1                                    |           |           |           | ✓         |           |           |           |           |           |           |           |           |           |
| TC-NF-05.1                                    |           |           |           |           | ✓         |           |           |           |           |           |           |           |           |
| TC-NF-06.1                                    |           |           |           |           |           | ✓         |           |           |           |           |           |           |           |
| TC-NF-06.2                                    |           |           |           |           |           |           | ✓         |           |           |           |           |           |           |
| TC-NF-06.3                                    |           |           |           |           |           |           |           | ✓         |           |           |           |           |           |
| TC-NF-07.1                                    |           |           |           |           |           |           |           |           | ✓         |           |           |           |           |
| TC-NF-08.1                                    |           |           |           |           |           |           |           |           |           | ✓         |           |           |           |
| TC-NF-09.1                                    |           |           |           |           |           |           |           |           |           |           | ✓         |           |           |

|                    |  |  |  |  |  |  |  |  |   |   |   |   |
|--------------------|--|--|--|--|--|--|--|--|---|---|---|---|
| <b>TC-NF-010.1</b> |  |  |  |  |  |  |  |  | ✓ |   |   |   |
| <b>TC-NF-011.1</b> |  |  |  |  |  |  |  |  |   | ✓ |   |   |
| <b>TC-NF-012.1</b> |  |  |  |  |  |  |  |  |   |   | ✓ |   |
| <b>TC-NF-013.1</b> |  |  |  |  |  |  |  |  |   |   |   | ✓ |

*Table 8. Non-Functional Requirements Matrix*