



## BUSINESS REQUIREMENTS DOCUMENT

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# Version History

Version	Date	Changes
1	October 11, 2023	Initial BRD Submission
2	October 31, 2023	<ul style="list-style-type: none"> <li>- Added features to table of contents</li> <li>- Fixed Scope details</li> <li>- Fixed User Types to adhere to business perspective</li> <li>- Features: <ul style="list-style-type: none"> <li>- Added EP scale</li> <li>- Removed Implementation Details</li> <li>- Fixed formatting and added necessary details</li> <li>- Clarified recoverable vs. non recoverable failure outcomes</li> </ul> </li> </ul>
3	November 2, 2023	<ul style="list-style-type: none"> <li>- Fixed core component business requirements</li> <li>- Specifying homepage view</li> <li>- Detecting expired registration link</li> <li>- Specifying username for login</li> <li>- Added Default Behaviors</li> </ul>
4	November 4, 2023	<ul style="list-style-type: none"> <li>- Clearer and more accurate details for 'Authentication'</li> <li>- Divided app permissions by user story</li> <li>- Clearer default behaviors</li> </ul>
5	November 5, 2023	<ul style="list-style-type: none"> <li>- Fixed core requirements required inputs</li> <li>- Fixed core requirements success outcomes</li> <li>- Fixed overall formatting and spacing of document</li> <li>- Reduced redundancy in failure outcomes</li> </ul>
6	November 5, 2023	<ul style="list-style-type: none"> <li>- Replaced 'user's email' with 'user's username' for consistency, except in contexts where communication is specifically sent to the user's email address.</li> <li>- Moved OTP requirements into success/failure outcomes</li> </ul>
7	November 5, 2023	<ul style="list-style-type: none"> <li>- Specified user's username input for 'User Data Protection Manager' and 'Account Management Center'</li> </ul>

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# PROJECT OVERVIEW

## GOALS

**Enhance Productivity:** Offer an all-in-one user-friendly platform that provides tools and features that not only accelerate daily productivity but also streamline the reservation process, eliminating time-consuming searches and ensuring hassle-free bookings.

**Effective Administrative Control:** Offer tools and controls that enable effective administrative oversight and management of reservations and floor plans.

**Specialized Features For Employee Reservations:** Equip employees with specialized features for reserving spaces within their office environment, accommodating for both in-person and remote employees.

**Facilitating Access and Convenience For General Users:** Ensure that general users can effortlessly discover and reserve spaces within a wide range of facilities, providing them with a convenient and seamless experience when planning their activities.

## VALUES

The value of Space Surfer comes from its ability to help users be more productive in their work and personal lives by eliminating the need to manually find areas to work, dine, and reserve other spaces for other activities. Not only is our website valuable for the general public to use, but also for employers and facility managers who wish to streamline their company's use of space. Therefore, providing a site specializing in reservations is great for efficiently allocating spaces for use as well as promoting a busy and productive environment. Through our website's scope, which expands beyond just office spaces, we create a convenient place for all types of work, both professionally and recreationally, to be done.

## BUSINESS DRIVERS

**Boosted Workplace Productivity:** By streamlining the reservation process through the platform, SpaceSurfer aims to improve both individual and team productivity. This ensures that time isn't wasted in finding or managing spaces, but rather invested in productive tasks.

**Cost Reduction:** Organized allocation and use of spaces can lead to significant savings. By preventing overbooking, underutilization, or mismanagement of spaces, the platform directly impacts organization costs.

**Effective Administrative Oversight:** Strong administrative management is at the heart of the platform. This allows for agile adjustments, ensuring that the office spaces and facilities are always aligned with the organization's needs.

# PROJECT SCOPE

SpaceSurfer will be designed to streamline facility management for various organizations, spanning from office spaces to public amenities like restaurants, libraries, and parks. SpaceSurfer prioritizes reservation accuracy and respects time constraints, allowing users to book up to one week in advance in a 24-hour format. Focusing on security, SpaceSurfer implements robust measures in place to safeguard sensitive data across all facility types, ensuring compliance with privacy regulations. SpaceSurfer cannot be used to directly communicate between employees and managers.

## Initial System:

- Single-page web application
- Facilities in Irvine, California
- Users age 13 and up
- PST timezone
- Utilizing the Imperial System
- Support American English Language
- Score of 75 or more for every category on Google's Pagespeed Insights

## Initial System:

- The system would have 3 super admins preset in the system

## Initial Audience:

- All companies or facilities located in Irvine, California
- Anyone in Irvine or surrounding areas

## Support:

- Standard desktop display resolution (1920 px x 1080 px)
- Tablet and smartphone display resolutions
- Compatible with browsers using Google Chrome version 105.0.5195.127 or later

# USER TYPE REQUIREMENTS

	Super Admin	Company Manager	Public Facility Manager	Employee	General User
Add/delete floor plans	Yes	Yes	Yes	No	No
Add/delete inventory	Yes	Yes	No	No	No
Delete/Modify users' reservations	Yes	Yes (only reservations within the office building)	Yes	No	No
View all bookings	Yes	Yes (only bookings within the office building)	Yes (only bookings in corresponding facility)	No	No
Delete other user's account	Yes	Yes (only employees)	No	No	No
Manage user permissions	Yes	No	No	No	No
Reserve available spaces	Yes	Yes	Yes	Yes	Yes
Delete/modify personal reservations	Yes	Yes	Yes	Yes	Yes
Add/delete rentable inventory for employees	Yes	Yes	No	No	No
Add/delete reservable parking spots	Yes	Yes	No	No	No
Delete account and all saved information	Yes	Yes	Yes	Yes	Yes
View floor plan	Yes	Yes	Yes	Yes	Yes
Rent out inventory	Yes	Yes	No	Yes	No
Register Employee Account	No	Yes	No	No	No
Recover user accounts	Yes	No	No	No	No
View Usage Analysis Dashboard	Yes	No	No	No	No



## Super Admin

- Role within an organization with the highest level of access and control for managing administrative functions, user access, system operations, and security operations
- Work closely with Company Manager as they oversee a department; Super Admin can implement system changes as per Company Manager's decisions and needs of the department
- Super Admin manages Employee accounts, giving them limited access and permissions within the system
  - Super Admin monitors account recovery process for all company worker accounts
  - Super Admin manages user data and information stored within the system
  - Super Admin enforces security compliance upon all Employees within the system

## Company Manager

- Role within an organization who holds a leadership position and manages a specific department or building
- Works closely with Super Admin; both roles help define access permissions of system configurations to align with the needs of the department; Company Manager makes the decisions and Super Admin implements them
- Company Manager has direct leadership over Employees in their department; set performance expectations and provide Employees with guidance around the system
  - Company Manager allocates spaces within the company for Employees to use
  - Company Manager registers/distributes Employee accounts in the system
  - Company Manager manages communication between Employee and Super Admin

## Public Facility Manager

- Role is responsible for the overall operation, maintenance, and administration of a public facility
- Responsible for providing a well-maintained, safe, and user-friendly system for the General User; help meet the expectations of the General User
  - Public Facility Manager allocates resources and spaces for General Users
  - Public Facility Manager provides information and details about the facility
  - Public Facility Manager ensures system is accessible to all General Users
  - Public Facility Manager enforces security compliance upon General Users

## Employee

- Role working under an organization contributing to the overall success and functionality in exchange for compensation; provided with limited access and permissions of the system
- Employees are directly managed by the Company Manager of their department; Employee performance is set by the Company Manager
  - Employees can contact Company Manager for technical assistance around the system
  - Company Manager can assist in updating Employee's profile/information
- Employees are given the necessary access and tools to perform their jobs by the Super Admin
  - Super Admin can change Employees user role and permission if necessary
  - Employee can request retrieving data and managing data from Super Admin

## General User

- Role can access and utilize public facilities and services available in the system
- General User is the visitor/customer of the public facility and utilize the available space and services provided by the Public Facility Manager
  - General User can request retrieving data and managing data from system administrator

# PERMISSION VS. SCOPE

* Blank cells signify that it is not a valid connection										
	Account	Floor Plan	Reservable Space	Reservable Space Availability	Reservation	PII Data	Layout	Account Recovery Request	Usage Analysis Dashboard	Service Provider
View	Account UI	Floor Plan PDF	List of Reservable Spaces	Indicator UI of Available Spaces	Reservation Details	Requested PII data	User Role Layout		Dashboard UI	
Delete	User Account	Remove Uploaded Floor Plans	Spaces from List		Reserved Space or Inventory	PII Data				
Create	User Account	Upload Floor Plans	Add to List of Spaces							
Reserve			Spaces from List							User Services
Modify	Account Information	Replace Uploaded Floor Plans	Add/Remove Spaces from List		Change Reservation Date and Time					
Recover	Account Data									
Accept								Recovery Request		
Login	Account Authentication									
Logout	Account Authentication									
Filter					Reservation Details Based on Criteria					
Download					Reservation Information	Requested PII Data				
Waitlist			Occupied Space							

# DEFAULT BEHAVIORS

## Error Logs

Timestamp of Error:

- Date Time format : yyyy-MM-dd HH:mm (UTC)
- i.e, 2023-11-17 10:42 AM

Log Level: [Info|Debug|Warning|Error]

User: [User's username if registered, otherwise 'null']

Category: [Business|View|Server|Data|Data Store]

Description: "[Feature] errored at [Log Level] level."

## Invalid User Input

System will display the following message: "One or more inputs are invalid. Please try again."

Error is logged with the following data:

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - i.e, 2023-11-17 10:42 AM
- Log Level: Error
- User: [User's username if registered, otherwise 'null']
- Category: Business
- Description: "Invalid user input"

## Time Limit for Operation Exceeded

### Timeout length of 0.1 seconds - 3.0 seconds

A response time that falls within this range is considered acceptable and is treated as a successful outcome.

### Timeout length of 3.1 seconds - 5.0 seconds

A response time that falls within this range is considered tolerable and will produce a 'Warning' log but is still treated as a successful outcome.

- System will display the following message: "[Feature] took longer than expected, sorry!"
- Error is logged with the following data:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42 AM
  - Log Level: Warning
  - User: [User's username if registered, otherwise 'null']
  - Category: Business
  - Description: "Operation took longer than 3 seconds"

### **Timeout length of 5.0 seconds or more**

A response time that falls within this range is considered unacceptable, will produce an 'Error' log and be treated as a failure outcome.

- System will display the following message: "System timeout error"
- Error is logged with the following data:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42 AM
  - Log Level: Error
  - User: [User's username if registered, otherwise 'null']
  - Category: Business
  - Description: "[Feature] took longer than 5 seconds"

### **Unauthorized Access to Restricted Feature**

System will display the following message: "You are not authorized to access this feature"

### **No Participating Company/Facility**

System will display the following message: "Sorry, but we currently have no participating facilities or companies. This means there are no available spaces at the moment. Please check back later. "

### **Multiple Registration Violation**

System will display the following message: "[User's username] is already assigned to a company. A user cannot be assigned to more than one company."

### **No Data in the System**

In the context of an object with a 0 to many relationship where it is allowed for a parent record to have no associated child records without violating referential integrity, the system will display the following message: "No available data at this time."

### **Data Store Offline**

System will display the following message: "Data Store is offline, cannot complete operation."

- Error is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username if registered, otherwise 'null']
  - Category: Date Store
  - Description: "Data Store is offline"

## Asynchronous Processing

All functionalities must not block or impede any user from performing interactions with the system.

## View not Showing

System will display the following message: “View cannot be displayed at this time.”

- Error is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username if registered, otherwise 'null']
  - Category: View
  - Description: “View is unable to be displayed.”

# PHASE 1 REQUIREMENTS

## User Data Protection Manager

### 1. CPRA - 01 (Effort points [Hours]: 60) (Complexity: Medium to High)

As an authenticated user, I want the ability to access all Personally Identifiable Information (PII) data collected about me so that I can be fully informed of the extent and type of information the platform holds about me, allowing me to exercise my rights in line with data protection regulations.

### 2. CPRA - 02 (Effort points [Hours]: 40) (Complexity: Medium to High)

As an authenticated user, I want the ability to delete all PII data collected about me, so that I have control over my personal data, ensuring my privacy rights are respected.

#### Required User Inputs:

- Username
  - Must match username of logged-in user
- OTP (according to NIST SP 800-63b section 5.1.4.1)
  - Min: 8 characters
  - Valid lowercase letters: a-z
  - Valid uppercase letters: A-Z
  - Valid Numbers: 0-9

#### App Permissions:

##### For CPRA - 01:

- Permission: View
  - Scope: PII data

##### For CPRA - 02:

- Permission: Delete
  - Scope: PII data

#### Target Audience:

All registered users who wish to access their PII data collected in the database and be able to delete them

#### Pre-conditions:

1. Users must have an active authenticated session
2. User must have access to the profile personalization view
3. User must be on the profile personalization view and user privacy tab

### ***Success Outcome(s) - CPRA 01:***

- User will be prompted to enter their username within 3 seconds of submission
  - Email containing an OTP will be sent to the user within 3 seconds of user entering their username
  - User will then be prompted to enter the OTP to continue within 3 seconds after entering their username
- After the correct OTP is submitted, user will be prompted with a “request successfully submitted” message within 3 seconds
- OTP expires after successful one time submission
- OTP expires after 2 minutes from delivery
- OTP generates a password that has not been previously generated
- Successful request for PII access is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - User: [User's username]
  - Log Level: Info
  - Category: Data store
  - Description: “PII data successfully requested for access”
- Within 3 seconds of request submission, user will receive an email with a .txt file they can download to view their account data. The email will contain contents in this order:
  - Email will contain a message letting the user know that they requested their PII information (with a timestamp of request in format:
    - yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Email will contain a downloadable .txt file
    - .txt file will only contain the PII data associated with the verified credentials
    - .txt file will show current accurate PII data from the data store



### ***Failure Outcome(s):***

- User is not prompted to input their username. This is a non-recoverable issue, the system cannot detect error.
- The user is prompted to enter their username, however the following failures occur
  - Username prompt is inaccurate
  - Username prompt is blankThis is non-recoverable because there is no way for the system to know.
- Email containing the user's OTP takes longer than 3 seconds to send after user submits their username. This is non-recoverable because it is beyond the scope of our system.
- System generates an OTP that has previously been generated. This is a nonrecoverable issue, the system failed to generate a unique password
- OTP does not expire after successful one time submission. This is a nonrecoverable issue, the system does not detect password as expired.
- OTP does not expire after 2 minutes of delivery. This is a nonrecoverable issue, the system does not detect password as expired.
- Email containing the user's OTP is not sent to the user at all after submitting their username. This is non-recoverable because it is beyond the scope of our system.
- Email is successfully sent to the user within 3 seconds of the user submitting their username, however the following failures occur
  - Inaccurate email contents
  - Blank emailThis is non-recoverable because it is beyond the scope of our system.
- User is not prompted to enter their OTP within 3 seconds of submitting their username. This is non-recoverable because there is no way for the system to know.
- User is not prompted to enter their OTP at all after submitting their username. This is non-recoverable because there is no way for the system to know.
- The user is prompted to enter their OTP, however the following failures occur
  - OTP prompt is inaccurate
  - OTP prompt is blankThis is non-recoverable because there is no way for the system to know.

- The user inputs data that is invalid such as the following
  - Invalid username
  - Invalid OTP
    - Expired or incorrect

The System will output the following message “Invalid user inputs, please try again”.

- Error to request access to PII data is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Invalid user inputs”
- After verification, the user does not receive a "request successfully submitted" message within 3 seconds. This is a non-recoverable issue because the system cannot detect error.
- After verification, the user does not receive a "request successfully submitted" message at all. This is a non-recoverable issue, the system cannot detect error.
- Verification was successful, however the following failures occur
  - Success message is inaccurate
  - Success message is blank

This is non-recoverable because the system cannot detect error.

### ***Success Outcome(s) - CPRA 02***

- User will be prompted to enter their username within 3 seconds from the moment the user submitted the request
  - Email containing an OTP will be sent to the user within 3 seconds of user entering their username
  - User will then be prompted to enter the OTP to continue within 3 seconds after entering their username
- User’s PII information and account are deleted from the data store within 3 seconds
- A confirmation message is displayed to the user within 3 seconds of operation, indicating successful deletion
- Post-deletion, users are redirected to the homepage as unauthenticated visitors within 3 seconds
  - Users cannot re-login with previously deleted credentials unless they re-register
  - Users are allowed to re-register using previously deleted credentials

- An email is sent to the user within 3 seconds post-deletion. The email will contain contents in this order:
  - The email confirms the deletion of both the PII data and the user account
  - The email states that all user data has been successfully removed
  - Timestamp in format: yyyy-MM-dd hh:mm AM/PM (PST) i.e, 2023-11-17 10:42 AM
- Successful account data deletion is logged
  - Timestamp of successful account recovery:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Successful request to recover account"

### ***Failure Outcome(s)***

- User is not prompted to input their username. This is non-recoverable because there is no way for the system to know.
- The user is prompted to enter their username, however the following failures occur
  - Email prompt is inaccurate
  - Email prompt is blank
 This is non-recoverable because there is no way for the system to know.
- Email containing the user's OTP takes longer than 3 seconds to send after user submits their username. This is non-recoverable because it is beyond the scope of our system.
- Email containing the user's OTP is not sent to the user at all after submitting their username. This is non-recoverable because it is beyond the scope of our system.
- Email is successfully sent to the user within 3 seconds of the user submitting their username, however the following failures occur
  - Inaccurate email contents
  - Blank email
 This is non-recoverable because it is beyond the scope of our system.
- User is not prompted to enter their OTP within 3 seconds of submitting their username. This is non-recoverable because there is no way for the system to know.

- User is not prompted to enter their OTP at all after submitting their username. This is non-recoverable because the system cannot detect error
- The user is prompted to enter their OTP, however the following failures occur
  - OTP prompt is inaccurate
  - OTP prompt is blank
 This is non-recoverable because the system cannot detect the error.
- The user inputs data that is invalid such as the following
  - Invalid email
  - Invalid OTP
 The System will output the following message "Invalid user inputs, please try again".
  - Error to request access to PII data is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data
    - Description: "Invalid user inputs"
- After verification, the system does not display a "Request successfully submitted" message within 3 seconds from submission. This is non-recoverable because the system cannot detect the error.
- After verification, the user does not receive a "request successfully submitted" message at all. This is non-recoverable because the system cannot detect the error.
- Verification was successful, however the following failures occur
  - Success message is inaccurate
  - Success message is blank
 This is non-recoverable because the system cannot detect error.
- Data store takes longer than 3 seconds to remove user's data and account from the moment of the user submitting their OTP. The System will display the following message: "Account deletion took longer than expected. Please try again later." and log "Time Limit for Operation Exceeded" log.
- Only some of the user's data is deleted from the database. This is non-recoverable because the system cannot detect error.
- User does not receive a message on the screen within 3 seconds letting them know their data has been deleted. This is non-recoverable because the system cannot detect the error.
- User does not receive a message on the screen at all letting them know their data has been deleted. This is non-recoverable because the system cannot detect error.

- Deletion is successful and the success message is prompted, however the following failures occur
  - Success prompt is inaccurate
  - Success prompt is blank

This is non-recoverable because the system cannot detect error.

- User does not receive email confirmation of the operation within 3 seconds of success deletion. This is non-recoverable because it is beyond the scope of our system.
- User does not receive email confirmation of the operation at all. This is non-recoverable because it is beyond the scope of our system.
  - Email is successfully sent to the user within 3 seconds of the user submitting their username, however the following failures occur
    - Email contents are inaccurate
    - Email is blank

This is non-recoverable because it is beyond the scope of our system.

- User is not redirected to the homepage as an unregistered and logged out user within 3 seconds of deletion. This is non-recoverable because the system cannot detect error.
- User is not redirected to the homepage as an unregistered and logged out user at all after deletion. This is non-recoverable because the system cannot detect error.
- Users are able to log back in using their deleted credentials (without having registered with those credentials again). This is non-recoverable because the system cannot detect error.
- Users cannot register a new account using credentials that have previously been deleted. This is non-recoverable because the system cannot detect error.
- User is able to delete another user's account. This is non-recoverable, unable to retract that operation once it is done.

## Account Management Center

### Registration

1. **Reg - 01 (Effort points [Hours]: 25) (High Complexity)**

As an unregistered general user, I want to be able to register for an account on the platform, so that I can use registered, general-user features.

2. **Reg - 02 (Effort points [Hours]: 30) (High Complexity)**

As an unregistered company manager, I want to be able to register an admin account on the platform so that I can use registered company manager features, employee features, and general user features.

3. **Reg - 03 (Effort points [Hours]: 30) (High Complexity)**

As an unregistered public facility manager, I want to be able to register an admin account on the platform so that I can use registered facility manager features and general user features.

### **Required Input(s):**

User inputs are required in order to collect essential information, which facilitates the creation of a unique user profile. This data aids in account identification, communication, and secure authentication processes.

- First name
  - Min: 1 character
  - Max: 50 characters
  - a -z
  - A - Z
  - No special symbol characters
  - No numerical numbers
- Last name
  - Min: 1 character
  - Max: 50 characters
  - Valid lowercase letters: a - z
  - Valid uppercase letters: A - Z
  - No special symbol characters
  - No numerical numbers
- Email
  - The user must provide a valid email address. A valid email address will include:
    - Minimum of 3 characters
    - Must be in the format: <valid\_characters>@<valid\_characters>
    - a-z (case insensitive)
    - 0-9
    - May have special characters: . -
  - User must confirm their email within 2 hours of submission in order to successfully register

- Date of birth
  - The user must provide a valid date of birth. Valid date of births include:
    - Must be a valid date from January 1st, 1970 to the current date
    - Date format : yyyy-MM-dd
- For Reg-02 and Reg-03, Managers will also require:
  - Company/Facility name
    - Must be unique
    - Min: 3 characters
    - Max: 20 characters
    - All special characters valid
    - Valid lowercase letters: a-z
    - Valid uppercase letters: A-Z
    - Valid Numbers: 0-9
  - Company/Facility location
    - Must be unique
    - Must be formatted: building number street name, city, state
    - Must be in Irvine, California
  - Company/Facility hours
    - Whole numbers
    - 24-hour format
    - Days of the week
    - Specifies both opening and closing times
  - Indication of private company or facility
    - Checkbox that manager is registering a private company or public facility

***App Permissions:***

Permission: Register

Scope: Account

***Target Audience:***

Users with an interest in using the SpaceSurfer who have not yet created an account

***Pre-conditions:***

1. Able to access SpaceSurfer site
2. User must be on the registration view
3. User must not have an active authenticated session

### **Success Outcome(s):**

- After inputting valid information into the required inputs on the registration view and submitting, a message is displayed within 3 seconds telling the user an email confirmation has been sent to their email
  - Email will be sent within 3 seconds and will contain contents in the following format:
    - Message letting the user know that they have registered and that they must click on the link provided in the email to finish registration
    - Message specifying that their system-wide User's username will be their email the registered with
    - Link
  - The link will redirect the user to the homepage view within 3 seconds of clicking
  - User must confirm email address by clicking the link within 2 hours of registration submission in order to complete registration
- System admins cannot be created from the Registration view
- System failures resulting from registration do not result in the system going offline
- User is assigned a system-wide username, which will be the same as email registered
- Confirmation email of successful account creation is sent to user within 3 seconds from the moment of submitting the registration form with the following information:
  - Username : [user's username]
  - Message "Your SpaceSurfer account is created, you may now log in!"
- After being redirected to the homepage upon clicking the link in their email, user will be logged into the account they just created
- User has access to all features available to their user type upon becoming an authenticated user
- User account is created in the data store within 3 seconds from the moment of submitting the registration form
  - All inputted information is uploaded to the data store
  - Successful account registration is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - User: [User's username]
    - Log Level: Info
    - Category: Data store
    - Description: "Registration is successful"



### **Failure Outcome(s):**

- The user is able to load the registration view, however the following failures occur
  - View displays inaccurate information
  - View is blank

This is non-recoverable because there is no way for the system to know.

- The user inputs data that is invalid such as the following
  - Invalid first name
  - Invalid last name
  - Invalid username
  - Invalid date of birth
  - For Reg-02 and Reg-03:
    - Invalid Company/Facility name
    - Invalid Company/Facility location
    - Invalid Company/Facility hours

The System will output the following message “Invalid data, please try again”.

- Error to register account is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username if registered, otherwise 'null']
    - Category: Data
    - Description: “Invalid data inputted”
  - Confirmation email of successful account creation is not sent to the user within 3 seconds from the moment of submitting the registration form. This is non-recoverable because it is beyond the scope of our system
  - Email containing registration completion link is not sent at all. This is non-recoverable because it is beyond the scope of our system.
  - Email is successfully sent to the user within 3 seconds of the user submitting the registration form, however the following failures occur
    - Inaccurate email contents
    - Blank email
- This is non-recoverable because it is beyond the scope of our system.
- User clicks on the registration link to continue registration after 2 hours of the link being sent. System will navigate the user to an error message. Error will display the following message “The link is expired, please try registering again.”
  - User can still continue registering after 2 hours of the link being sent. This is non-recoverable, unable to retract operation once completed.

- After clicking the link in the email, user is not automatically logged in when sent to the homepage. This is non-recoverable because there is no way for the system to know.
- The wrong user type is assigned and the user is able to access features not applicable to them. This is non-recoverable because there is no way for the system to know.
- Form submission goes through but data is not saved to the data store. The system will output the following message “The registration was not saved, please try again later.”
- New user is created in the data store after 3 seconds from the moment of submitting the registration form. System will log default “Time Limit for Operation Exceeded”.
- New user is added into the data store within 3 seconds from the moment of submitting the registration form, however any one or more of the following information is inaccurate
  - First name
  - Last name
  - User’s username
  - Date of birth
  - For Reg-02 and Reg-03:
    - Company/Facility name
    - Company/Facility location
    - Company/Facility hours

This is non recoverable, the system would not know if the data is inaccurate.

- Failed to register new user because the database is offline. The system will output the following message: “Database is not able to save changes right now, please come back later.”
  - Error to register account is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username if registered, otherwise ‘null’]
    - Category: Data store
    - Description: “Data store is offline, cannot accept data”

## **Profile Personalization**

### **1. PP - 01 (Effort points [Hours]: 20) (Complexity: Medium)**

As an authenticated user, I want to be able to update and view my account information on the platform, so that I can keep my information accurate and up-to-date.

### **2. PP - 02 (Effort points [Hours]: 5) (Complexity: Medium)**

As an authenticated company manager, I want to also be able to update and view my company's location as it appears on my profile so that I can ensure that the company's location is accurately represented.

### **3. PP - 03 (Effort points [Hours]: 5) (Complexity: Medium)**

As an authenticated public facility manager, I want to also be able to update and view the location of my public facility as displayed on my profile, so that visitors and users of the facility can easily find us.

### ***Optional Input(s):***

User inputs in this section are optional. They're here to offer flexibility and personalization within the app if users decide to use them.

- First name
  - Min: 1 character
  - Max: 50 characters
  - No special symbol characters
  - No numerical numbers
- Last name
  - Min: 1 character
  - Max: 50 characters
  - No special symbol characters
  - No numerical numbers
- For PP-02 and PP-03, Managers will also have access to update:
  - Company/Facility location
    - Must be unique
    - Must be formatted: building number street name, city, state
    - Must be in Irvine, California
  - Company/Facility hours

### ***App Permissions***

Permission: Update

Scope: Account

### ***Target Audience:***

All registered users who wish to view or update information on their profile.

**Pre-conditions:**

1. Users must be registered and logged in
2. Users must access profile personalization view

**Success Outcome(s):**

- Correct information is displayed on profile page upon loading onto the Profile Personalization view
- Changes are recorded correctly on the data store upon save
- If changes are submitted and valid, new information will be reflected on profile within 3 seconds of update submission
- Operation is logged after successful submission
  - Timestamp of successful upload
    - yyyy-MM-dd HH:mm (UTC) i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Made a successful update of user's profile."

**Failure Outcome(s)**

- Changes are recorded in the data store after 3 seconds from the moment of submitting the form. System will log default "Time Limit for Operation Exceeded".
- Changes are recorded in the data store within 3 seconds from the moment of submitting the form, however any one or more of the following information is inaccurate
  - First name
  - Last name
  - Profile information specific to PP - 02 and PP - 03

This is non recoverable, the system would not know if the data is inaccurate.

- The user is able to load onto their profile personalization view, however the following failures occur
  - Inaccurate data is displayed
  - View is blank

This is non-recoverable because there is no way for the system to know.

- The user inputs data that is invalid such as the following
  - Invalid first name
  - Invalid last name
  - Invalid profile information specific to PP - 02 and PP - 03

The System will output the following message “Invalid data, please try again”.

- Error to update profile is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Invalid data inputted”
- Changes are recorded in the data store, however the following failures occur
  - Inaccurate data is displayed
  - No changes are reflected
  - View is blank

This is non-recoverable because there is no way for the system to know.

- Failed to update profile because the database is offline. The system will output the following message: “Database is not able to save changes right now, please come back later.”
  - Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Data store is offline, cannot accept data”

## **Account Deletion**

### **1. AD - 01 (Effort points [Hours]: 30) (Complexity: Medium)**

As an authenticated user, I want to have the option to delete my account and all associated data, so that I can have control over my personal information, ensuring my privacy and data security are maintained.

### **2. AD - 02 (Effort points [Hours]: 5) (Complexity: Medium)**

As an authenticated company manager, when I delete my account, I want all accounts of my employees to also be deleted, so that I can protect corporate information.

### **3. AD - 03 (Effort points [Hours]: 5) (Complexity: Medium)**

As an authenticated facility manager, I want my facility information to be deleted and made unviewable to other users upon the deletion of my account, so that I can manage the visibility and accessibility of my facility’s information, safeguarding against unauthorized use from the public.

**Required Input(s):**

User input is required in order to verify that the user does intend to proceed with the account deletion process. This is crucial for preventing accidental or unauthorized deletion requests, safeguarding users' data and accounts from inadvertent loss.

- Username of the user currently logged in
- OTP (according to NIST SP 800-63b section 5.1.4.1)
  - Min: 8 characters
  - Valid lowercase letters: a-z
  - Valid uppercase letters: A-Z
  - Valid Numbers: 0-9

**App Permissions:**

Permission: Delete

Scope: Account

**Target Audience:**

All registered users who wish to delete their account (permanently) and have their data removed.

**Pre-conditions:**

1. Users must be registered and logged in
2. User indicates request to delete account
3. Users must enter their username to confirm deletion is authorized

**Success Outcome(s)**

- User will be prompted to enter their username within 3 seconds
  - Email containing an OTP will be sent to the user within 3 seconds of user entering their username
  - User will then be prompted to enter the OTP to continue within 3 seconds after entering their username
- User's account is deleted from the data store within 3 seconds
- A confirmation message is displayed to the user within 3 seconds of operation, indicating successful deletion
- System generates an OTP that has not been previously generated
- OTP expires after successful one time submission

- OTP expires after 2 minutes of delivery
- Post-deletion, users are redirected to the homepage as unauthenticated visitors within 3 seconds
  - Users cannot re-login with previously deleted credentials unless they re-register
  - Users are allowed to re-register using previously deleted credentials
- An email is sent to the user within 3 seconds post-deletion. The email will contain contents in this order:
  - The email confirms the deletion the user account
  - Timestamp in format:
    - yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
- User's account will be removed from the data store along with all the information pertaining to it
- For AD - 02, all company manager's employee accounts will be deleted as well
- For AD - 03, facility manager's location will be deleted and no longer viewable for other users
- Operation is logged after successful deletion
  - Timestamp of successful upload
    - yyyy-MM-dd HH:mm (UTC) i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Successfully deleted account."
- Users will no longer be able to log in to their deleted accounts without having to register with those credentials again

#### ***Failure Outcome(s):***

- User is not prompted to input their username. This is non-recoverable because there is no way for the system to know.
- The user is prompted to enter their username, however the following failures occur
  - Username prompt is inaccurate
  - Username prompt is blank
 This is non-recoverable because there is no way for the system to know.

- Email containing the user's OTP takes longer than 3 seconds to send after user submits their username. This is non-recoverable because it is beyond the scope of our system.
- Email containing the user's OTP is not sent to the user at all after submitting their username. This is non-recoverable because it is beyond the scope of our system.
- Email is successfully sent to the user within 3 seconds of the user submitting their username, however the following failures occur
  - Inaccurate email contents
  - Blank email

This is non-recoverable because it is beyond the scope of our system.

- User is not prompted to enter their OTP within 3 seconds of submitting their username. This is non-recoverable because there is no way for the system to know.
- User is not prompted to enter their OTP at all after submitting their username. This is non-recoverable because there is no way for the system to know.
- The user is prompted to enter their OTP, however the following failures occur
  - OTP prompt is inaccurate
  - OTP prompt is blank
- OTP does not expire after successful one time submission. This is a nonrecoverable issue, the system does not detect password as expired.
- System generates an OTP that has previously been generated. This is a nonrecoverable issue, the system failed to generate a unique password
- OTP does not expire after 2 minutes of delivery. This is a nonrecoverable issue, the system does not detect password as expired.
- The user inputs data that is invalid such as the following
  - Invalid username
  - Invalid OTP (expired or incorrect)

The System will output the following message "Invalid data, please try again".

- Error to delete account is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: "Invalid data inputted"



- Verification was successful, however the following failures occur

- Success message is inaccurate
- Success message is blank

This is non-recoverable, system can't detect error

- Data store takes longer than 3 seconds to remove user's data and account from the moment of the user submitting their OTP. System will log default "Time Limit for Operation Exceeded".
- Only some of the user's data is deleted from the database. This is non-recoverable because the system would not know the operation was a failure.
- User does not receive a message on the screen within 3 seconds letting them know their data has been deleted. This is non-recoverable, system can't detect error
- User does not receive a message on the screen at all letting them know their data has been deleted. This is non-recoverable, system can't detect error
- Deletion is successful and the success message is prompted, however the following failures occur
  - Success prompt is inaccurate
  - Success prompt is blankThis is non-recoverable because there is no way for the system to know.
- User does not receive email confirmation of the operation within 3 seconds of success deletion. This is non-recoverable because it is beyond the scope of our system.
- User does not receive email confirmation of the operation at all. This is non-recoverable because it is beyond the scope of our system.
  - Email is successfully sent to the user within 3 seconds of the user submitting their username, however the following failures occur
    - Email contents are inaccurate
    - Email is blankThis is non-recoverable because it is beyond the scope of our system.
  - User is not redirected to the homepage as an unregistered and logged out user within 3 seconds of deletion. This is non-recoverable because there is no way for the system to know.
  - User is not redirected to the homepage as an unregistered and logged out user at all after deletion. This is non-recoverable, system can't detect error

- Users are able to log back in using their deleted credentials (without having registered with those credentials again). This is non-recoverable, system can't detect error
- Users cannot register a new account using credentials that have previously been deleted. This is non-recoverable, system can't detect error
- User is able to delete another user's account. This is non-recoverable, unable to retract that operation once it is done.

## **Account Recovery**

### **1. AR - 01 (Effort points [Hours]: 30) (Complexity: High)**

As a registered user, I want to be able to securely recover my account, so that I can regain access to my account without compromising the security of my personal information.

#### ***Required User Input(s):***

User inputs are required in order to verify the identity of the individual attempting to recover the account and ensure the security of the account recovery process.

- Username used to register account
- OTP (according to NIST SP 800-63b section 5.1.4.1)
  - Min: 8 characters
  - Valid lowercase letters: a-z
  - Valid uppercase letters: A-Z
  - Valid Numbers: 0-9
- "Submit" indication

#### ***App Permissions:***

Permission: Recover

Scope: Account

#### ***Target Audience:***

All registered users who wish to recover an active or disabled account securely.

#### ***Pre-conditions:***

1. User must be registered
2. User must click "Recover Account" on login view
3. User must be on Recover Account view
4. User must know username assigned to account
5. User cannot have any active authenticated sessions on current device

### ***Success Outcome(s):***

- OTP is sent to user within 3 seconds from the moment of clicking “Recover Account” on login view
- Username and OTP inputs are valid
  - Inputs must match information in the data store
  - Data store will mark account state as ‘unrecovered’ within 3 seconds from the moment of submitting account recovery request
  - Success message ‘Account recovery request sent to system admin’ will be displayed within 3 seconds from the moment of submitting account recovery request
- System generates an OTP that has not previously been generated
- OTP expires after successful one time submission
- OTP expires after 2 minutes of delivery
- Request is available to authorized super admin within 3 seconds from the moment of submitting account recovery request
- Authorized super admin completes recovery request for user
- Data store will mark account state as ‘recovered’ within 3 seconds from the moment of super admin submitting recovery
- Registered user regains access to system
  - Email indicating account has been recovered is sent to user within 3 seconds from the moment of super admin submitting recovery
    - Message: “Your account has been recovered! You may now login”
  - User can go back to login screen to authenticate into the system
- System does not allow user to recover account if there are any authenticated sessions on current device

- Successful account recovery is logged
  - Timestamp of successful account recovery:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Info
  - User: [User's username]
  - Category: View
  - Description: "Successful request to recover account"

**Failure Outcome(s):**

- OTP is not sent to the user after clicking "Recover Account" on login view. This is a non-recoverable issue, the system cannot detect error.
- Email containing OTP takes longer than 3 seconds to send to the user after clicking "Recover Account" on login view. This is a non-recoverable issue, the system cannot detect error.
- Username and/or OTP inputs are invalid
  - Inputs do not match information in the data store
  - Submission marks account state as 'unrecovered' despite being invalid submission
  - Request is sent to super admin despite invalid submission
  - OTP is expired or incorrect

The system message will display "Invalid username or OTP provided. Please try again or contact system administrator"

Failed outcome is logged

- Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: "Invalid user input"
- System generates an OTP that has previously been generated. This is a nonrecoverable issue, the system failed to generate a unique password
  - OTP does not expire after 2 minutes of delivery. This is a nonrecoverable issue, the system does not detect password as expired.

- Username and OTP inputs are valid, however:
  - OTP does not expire after successful one time submission. This is a nonrecoverable issue, the system does not detect password as expired.
  - Request takes longer than 3 seconds to become available to super admin from the moment of submitting a recovery request. The system will display: “Account recovery request took longer than expected, sorry!”
  - Recovery request is available to super admin, but system message “Account recovery request sent” takes longer than 3 seconds to become available to super admin from the moment of submitting recovery request. System will log default “Time Limit for Operation Exceeded”
  - Request is not available to super admin. This is a non-recoverable issue, the system cannot detect error
  - Recovery request is available to super admin, but system message “Account recovery request sent” is never displayed. This is a non-recoverable issue, the system cannot detect error
  - Submission does not mark the account state as ‘unrecovered’. This is a non-recoverable issue, the system cannot detect error
  - Submission takes longer than 3 seconds to mark an account as “unrecovered” from the moment of submitting a recovery request . System will log default “Time Limit for Operation Exceeded”.
  
- Super admin clicks “Recover account”, however:
  - System does not mark the account state as ‘recovered’. This is a non-recoverable issue, the system cannot detect error.
  - System takes longer than 3 seconds to mark an account as “unrecovered” from the moment of submitting account recovery. This is a non-recoverable issue, the system cannot detect error
  - Registered user does not regain access. This is a non-recoverable issue, the system cannot detect error
  - System takes longer than 3 seconds to allow registered users to regain access to their account from the moment of super admin submitting account recovery. This is a non-recoverable issue, the system cannot detect error

- Email indicating the account has been recovered takes longer than 3 seconds from the moment of super admin submitting recovery. This is a non-recoverable issue, the system cannot detect error
- Email indicating the account has been recovered is never delivered. This is a non-recoverable issue, the system cannot detect error
- Email indicating account has been recovered does not display the following:
  - “Your account has been recovered! You may now login”

This is a non-recoverable issue, the system cannot detect error

- Failed to request account recovery because the database is offline. The system will output the following message: “Database is not able to save changes right now, please come back later.”

Error is logged

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Error
- User: [User's username]
- Category: Error
- Description: “Database is not responsive”

- Failed to load the Account Recovery view. The system will output the message “View cannot be loaded right now, please come back later.”

Error is logged

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Error
- User: [User's username]
- Category: Error
- Description: “View is not available”

## **2. AR - 02 (Effort points [Hours]: 30) (Complexity: Medium)**

As an authorized super admin, I want to be able to view details and complete the process pertaining to a recovery request made by a registered user, so that I can monitor and ensure the recovery process is secure.

### **Required User Input(s):**

User inputs are required in order to ensure the security of the account recovery process.

- Click “Recover Account” for corresponding user that wishes to get account recovered

**App Permissions:**

Permission: Accept

Scope: Recover Request

**Target Audience**

Super Admin

**Pre-conditions**

1. Super Admin must be registered
2. Super Admin must be logged in
3. Super Admin must be on "Recover User Account" view
4. A registered user must have submitted a request to recover account

**Success Outcome(s):**

- Request is displayed on the "Recover User Account" view within 3 seconds of successful registered user submission. Details will include:
  - Username
  - Request time
    - Date Time format: yyyy-MM-dd hh:mm AM/PM (PST)
- Super admin clicks "Recover account" for a single user request
  - A message displays "Account recovery completed successfully for user" within 3 seconds from the moment of submitting account recovery
  - Data store will mark account as 'recovered' within 3 seconds from the moment of submitting account recovery
- Registered user regains access to system
- Operation is logged after successful account recovery submission
  - Timestamp of successful account recovery submission:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Info
  - User: [User's username]
  - Category: Data
  - Description: "Super admin has recovered account for [username]"

**Failure Outcome(s):**

- User request is not viewable to super admin in "Recover User Account" view after successful user submission. This is a non-recoverable issue, the system cannot detect error

- User request displays incorrect information in “Recover User Account” view
  - Incorrect username
  - Incorrect request time

This is a non-recoverable issue, the system cannot detect error
- User request takes longer than 3 seconds to display to super admin after successful user submission. System will log default “Time Limit for Operation Exceeded”.
- Super admin clicks “Recover account”, however:
  - System message “Account recovery completed successfully for user” is not displayed. This is a non-recoverable issue, the system cannot detect error.
  - System message “Account recovery completed successfully for the user” takes longer than 3 seconds to display. This is non-recoverable, the system would not know if the message appeared on screen or not.
  - System message displays within 3 seconds, however registered users never regain access. This is a non-recoverable issue, the system cannot detect error
  - System message displays within 3 seconds, however registered user takes longer than 3 seconds to regain access. This is a non-recoverable issue, the system cannot detect error
  - Data store does not mark the account state as “recovered”. This is a non-recoverable issue, the system cannot detect error
  - Data store takes longer than 3 seconds to mark the account state as “recovered” from the moment the user logs in with the OTP. System will log default “Time Limit for Operation Exceeded”

## **Employee Account Setup**

### **1. AMS - 01 (Effort points [Hours]: 30) (Complexity: High)**

As a registered Company Manager, I want the ability to create an account for my employees using their respective company email addresses, so that I can ensure that all employees have access to necessary resources and platforms promptly and securely.

### **2. AMS - 02 (Effort points: 12) (Complexity: Medium)**

As an unregistered employee of a company, I want to be able to verify and complete registration through the link sent to my company email address, so that I can confirm my identity and finalize my account setup efficiently, enabling me to start using the platform’s services.

## ***Required User Input(s)***

Company Manager inputs are required in order to set up and give access to their new employees. Employee inputs are required in order to validate accounts and set up a password.



- For AMS-01, Company Manager must Input:
  - Employee first name
    - Valid Characters:
      - Min: 1 character
      - Max: 50 characters
      - a - z
      - A - Z
    - Invalid Characters:
      - Special symbol characters
      - Numerical values
  - Employee last name
    - Valid Characters:
      - Min: 1 character
      - Max: 50 characters
      - a - z
      - A - Z
    - Invalid Characters:
      - Special symbol characters
      - Numerical values
  - Employee email
    - Must be unique
    - Local part:
      - Valid lowercase letters: a-z
      - Valid uppercase letters: A-Z
      - Valid Numbers: 0-9
      - Valid special characters:
        - \_
        - .
        - -
        - cannot start with a valid special character nor have consecutive special characters (e.g., John..Smith@gmail.com)
    - Domain part:
      - domain name:
        - Valid lowercase letters: a-z
        - Valid uppercase letters: A-Z
        - Valid Numbers: 0-9
        - Valid special characters:
          - \_
          - .
          - cannot start with a valid special character nor have consecutive special characters (e.g., John..Smith@gmail.com)

➤ TLD:

- string specific
  - “.com”, “.net”, “.gov”, “.org”, etc.
- @ symbol must divide the local and domain parts
- Date of birth
  - Must be a valid date from January 1st, 1970 to the current date
  - Date format : yyyy-MM-dd
- For AMS-02, Employee must:
  - Click verification link sent to company email address that redirects to “Verify Employee Account” view
  - Select “Verify Employee Account”

### ***App Permissions***

Permission: Register

Scope: Employee Account

### ***Target Audience***

Company managers and their employees

### ***Pre-conditions***

1. The Company Manager must be logged in
2. Company Manager must be on “Add Employee Account” view
3. Employees must have a company email address associated with the business

### ***Success Outcome(s):***

- For AMS - 01:
  - Information inputted by company manager are added to the data store, which are:
    - Employee first and last name
    - Employee email
    - Employee Date of birth
    - User type: Employee
  - Operation is logged after successful submission
    - Timestamp of successful submission:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Info
    - User: [Manager’s username]
    - Category: Data store
    - Description: “Successful submission of employee information”

- For AMS - 02:
  - Employee receives email within 3 seconds from the moment Company Manager submitted account
    - Link in email redirects employee to “Verify Employee Account” view to complete registration
  - Data store will mark account as ‘verified’ within 3 seconds from the moment employee selects ‘Verify Employee Account’
  - System will display “Employee Account has been created, you may now login” within 3 seconds from the moment employee selects “Verify Employee Account”
  - Employee is able to login within 3 seconds from the moment they verify account
  - Employee has access to employee user type functionalities
  - Operation is logged after successful employee account creation
    - Timestamp of successful account verification:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Info
    - User: [Employee's username]
    - Category: Data store
    - Description: “Successful verification of employee account”

### ***Failure Outcome(s)***

- For AMS - 01:
  - Company Manager inputs are invalid. The system message will display “Invalid user inputs, please try again for successful submission”  
Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data
    - Description: “Employer submitted invalid employee information”
  - Valid information inputted by the Company Manager is not added to the data store. This is a non-recoverable issue, the data is lost.

- Valid information inputted by the Company Manager takes longer than 3 seconds to be added to the data store from the moment they submit the employee account. System will log default “Time Limit for Operation Exceeded”
- Valid information inputted by the Company Manager is inaccurately added to the data store. This is a non-recoverable issue, the system cannot detect error.

■ For AMS - 02:

- Employee does not receive an email to complete registration. This is a non-recoverable issue, the system cannot detect errors in the user's inbox
- Employee email takes longer than 3 seconds from the moment of employer submission of employee registration. This is a non-recoverable issue, the system cannot detect errors in the user's inbox
- Link in the email sent to the employee does not redirect to the “Verify Employee Account” view. This is a non-recoverable issue, the system cannot detect error
- Employee clicks ‘Verify Employee Account’ however:
  - data store does not mark account as ‘verified’. This is a non-recoverable issue, the system cannot detect errors in the user's inbox.
  - data store marking account as ‘verified’ takes longer than 3 seconds from the moment employee verifies account. The system will display “Employee account verification is taking longer than expected, sorry!”

Error is logged

  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [Employee’s username]
  - Category: Data store
  - Description: “Verifying account took longer than 3 seconds to complete”
- Data store store marks the account as ‘verified’, however the employee is unable to login. This is a non-recoverable issue, the system cannot detect error.

## User Security

### Authentication (Log-in):

**1. AuthN-01 (Effort Points [Hours]: 10) (Complexity: High)**

As an unregistered user, I can attempt to authenticate to obtain access to the secure functionalities.

**2. AuthN-02 (Effort Points [Hours]: 10) (Complexity: High)**

As a registered user, I want to authenticate my identity when logging into my account to ensure a secure experience on the platform.

### **Required Input(s):**

User inputs are required to verify the user's security identity to authenticate within the system. The authentication attempt will be logged with a timestamp, Date Time format : yyyy-MM-dd HH:mm (UTC) i.e,2023-11-17 10:42, and outcome (success/failed).

- Username
  - Must match with registered account username
  - Valid letters (case sensitive): a-z
  - Valid Numbers: 0-9
  - Valid special characters: \_ . @
    - cannot start with a valid special character nor have consecutive special characters (e.g., John..Smith)
  - Min: 8 characters
  - Max: 20 characters
- OTP (according to NIST SP 800-63b section 5.1.4.1)
  - Min: 8 characters
  - Valid lowercase letters: a-z
  - Valid uppercase letters: A-Z
  - Valid Numbers: 0-9

### **App Permission(s):**

Permission: Account Login

Scope: access to registered account

### **Target Audience:**

Valid registered users

### **Pre-conditions:**

1. Registered an account
2. Has no other open authenticated account on another device
3. Viewing log in view

**Success Outcome(s):**

- Authentication required by the system for all users
- System sends a valid OTP to user's email once valid username is inputted
- System generates an OTP that has not previously been generated
- OTP expires after 2 minutes of delivery
- OTP expires after successful one time submission
- User automatically directed to homeview after successful authentication login attempt
- Permissions and access granted based on role given
- System automatically redirects to home view within 3 seconds
- Successful login is logged
  - Timestamp of successful submission:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Info
  - User: [User's username if registered, otherwise 'null']
  - Category: Data
  - Description: "User has successfully logged in"
- For AuthN-01: Unregistered user will not be able to authenticate
  - System will display "This username has not been registered."

**Failure Outcome(s):**

- System goes offline if the system fails the authentication mechanism. This is non-recoverable, the system would be offline.
- Account is disabled after a maximum of 3 failed authentication attempts within 24 hours
  - 24-hour timer starts following the initial failed authentication attempt
  - Account and IP address that produced failed attempt(s) will be logged
  - Account remains locked until account owner or system admin performs account recovery process
    - failed authentication attempt counter resets to 0 upon successful account recovery

**Error is logged**

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Business
- User: [User's username]
- Category: Data
- Description: "User has been locked out of account after 3 failed attempts"

- User is not registered in the data store. This is a nonrecoverable issue, the data is lost
- OTP does not expire after successful one time submission. This is a nonrecoverable issue, the system does not detect password as expired.
- OTP does not expire after 2 minutes of delivery. This is a nonrecoverable issue, the system does not detect password as expired.
- System generates an OTP that has previously been generated. This is a nonrecoverable issue, the system failed to generate a unique password
- User is able to login with an expired OTP. This is a non recoverable issue, the system did not register the OTP as expired.
- User inputted invalid information
  - System will display “Invalid user inputs” will be displayed, highlighting invalid input(s) after user attempts to login with “Login” button
  - Possible invalid inputs:
    - Username
    - OTP (expired or incorrect)

Error is logged

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Error
- User: [User's username]
- Category: Data
- Description: “User has invalid inputs”
- Login operation takes longer than 3 seconds. System will log default “Time Limit for Operation Exceeded”
- For AuthN-01: Unregistered user is able to authenticate. This is a nonrecoverable issue, operation cannot be retracted.

### **Authentication (Log-out):**

#### **1. AuthN-03 (Effort Points [Hours]: 10) (Complexity: Medium)**

As an authenticated user, I can log out of my account in order to ensure a secure logout experience on the platform.

#### **2. AuthN-04 (Effort Points [Hours]: 10) (Complexity: Medium)**

As an authenticated user, the system will automatically log me out after 20 minutes of an inactive session in order to ensure a secure logout experience on the platform.

**App Permission(s):**

Permission: Logout

Scope: Account

**Pre-conditions:**

1. User has an opened active authenticated session on at least one device
2. User is on Account Center view, viewing logout option
3. User has been inactive for a minimum of one hour on authenticated session
4. Unauthenticated users do not have access to a logout request in the Account Center

**Success Outcome(s) - AuthN 03:**

- User will be automatically logged out of active session after logout request
- User will be redirected to login view as an unauthenticated user after successful logout
- Successful logout message will appear as “Successful Logout”
- Logout operation completed within 3 seconds
- Successful logout is logged
  - Timestamp of successful logout:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e,2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: View
  - Description: “Successful logout of authenticated user”

**Failure Outcome(s) - AuthN 03:**

- System remains online if the system fails logout mechanism. This is non-recoverable because the system cannot detect error.
- User is not directed to login view automatically as an unauthenticated user upon logout.
  - Error message, “Logout Error Occurred” will be displayed
  - Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: View
    - Description: “Logout did not redirect to login view”
- Logout operation takes longer than 3 seconds. System will log default “Time Limit for Operation Exceeded”



#### ***Success Outcome(s) - AuthN 04:***

- User will be automatically logged out after 20 minutes of an inactive session
- User will be redirected to login view as an unauthenticated user after successful logout
- Successful logout message will appear as “Successful Logout”
- Logout operation completed within 3 seconds
- Successful logout is logged
  - Timestamp of successful logout:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e,2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: View
  - Description: “Successful logout of authenticated user”

#### ***Failure Outcome(s) - AuthN 04:***

- System remains online if the system fails the logout mechanism. This is non-recoverable because the system cannot detect this error.
- User’s session is terminated via an inactive logout despite the user being active in the session. This is non-recoverable because the system cannot detect this error.
- User isn’t automatically directed to login view as unauthenticated user upon logout.
  - Error message, “Logout Error Occurred” will be displayed
  - Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: View
    - Description: “Logout did not redirect to login view”
- Logout operation takes longer than 3 seconds. System will log default “Time Limit for Operation Exceeded”

## **Authorization:**

### **1. Auth-01: (Effort Points [Hours]: 10) (Complexity: High)**

As an authenticated user, I want to be authorized to system permissions associated with my user role so I can navigate the page with the correct role based access controls .

### **2. Auth-02: (Effort Points [Hours]: 10) (Complexity: High)**

As an authenticated admin user, I want to ensure the users navigating this site are authorized to be granted the correct user role access.

## ***Required User Input(s):***

User inputs are required to identify user account roles. The authorization attempt will be logged with a timestamp, yyyy-MM-dd HH:mm (UTC) i.e,2023-11-17 10:42, and outcome (success/failed).

- Username
  - Must match with registered account username
  - Valid letters (case sensitive): a-z
  - Valid Numbers: 0-9
  - Valid special characters: \_ . @
    - cannot start with a valid special character nor have consecutive special characters (e.g., John..Smith)
  - Min: 8 characters
  - Max: 20 characters
- Role Selection
  - Valid Inputs: General User, Employee, Public Facility Manager, Company Manager, Super Admin
- Super Admin will require: User Permissions for Company Users
  - Must give RBAC and associated permissions per user role

## ***App Permissions:***

### **For Auth-01:**

- Permission: View
  - Scope: RBAC ( Account, Floor Plan, Spaces, Reservations, Data, Dashboard)

### **For Auth-02:**

- Permission: Modify
  - Scope: RBAC
- For Super Admin: View, Modify
  - Scope: Company Accounts
- For Company Manager: View, Modify
  - Scope: Employee Accounts

**Target Audience:**

Registered users given RBAC and associated permissions with their user role

**Pre-conditions:**

1. Registered an account
2. Authenticated user account
3. Active user

**Success Outcome(s):**

- Web page must be automatically refreshed within 3 seconds in order for the user to have correct permission access
- Successful authorization operation is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level:Info
  - User: [User's username]
  - Category: Data
  - Description: "Successful user role authorization"
- Successful authorization message popup displays "Successfully Authorized User" within 3 seconds after web page refreshes
- User granted to assigned user role
- User granted role-based access to features and their functionalities
- User granted read operations to authorized data
- User granted to automatically view authorized views
- Admin users granted write operations to authorized data
- Unauthorized users are unable to execute any authorized functionalities
- Unauthorized users are unable to access any authorized data
- Unauthorized users are unable to access any authorized views
- Unauthorized access operation is logged
  - Timestamp of error:

- Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Error
- User: [User's username if registered, otherwise 'null']
- Category: Data
- Description: "Unauthorized access to user role "

### ***Failure Outcome(s):***

- System remains online if system fails the authorization mechanism. This is non-recoverable because the system cannot detect error.
- Successful authorization operation is not logged. This is non-recoverable because the system cannot detect error.
- Unauthorized access operation is not logged. This is non-recoverable because the system cannot detect error.
- User does not gain required access. This is non-recoverable because the system cannot detect error.
- User granted incorrect role. This is non-recoverable because the system cannot detect error.
- User was given unintentional unrestricted access. This is non-recoverable because the system cannot detect error.
- User was given unintentional unrestricted access but cannot view or edit functionalities. This is non-recoverable because the system cannot detect error.
- User was given unintentional unrestricted access but cannot view or edit data. This is non-recoverable because the system cannot detect error.
- User was given unintentional unrestricted access but cannot view views. This is non-recoverable because the system cannot detect error.
- User inputted invalid information
  - Error message, "Invalid user inputs" will be displayed, highlighting invalid input(s) after user attempts to authorize account
  - Possible invalid inputs:
    - username
    - role selection
  - Error is logged
    - Timestamp of error:

- Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username if registered, otherwise 'null']
  - Category: Data
  - Description: "Incorrect information upon authorizing account"
- User inputted incorrect information
  - Error message, "Incorrect user inputs" will be displayed, highlighting incorrect input(s) after user attempts to authorize account
  - Possible incorrect inputs:
    - username
    - role selection
  - Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username if registered, otherwise 'null']
    - Category: Data
    - Description: "Incorrect information upon authorizing account"
- Login operation takes longer than 3 seconds  
Error is logged. System will log default "Time Limit for Operation Exceeded"

## System Observability

### Usage Analysis Dashboard:

#### **1. UAD-01 (Effort Points [Hours]: 20) (Complexity: Medium to High)**

As a system administrator, I want to analyze user behavior and system performance over selectable time spans to gain insights into the system's usage.

#### **Optional User Input(s):**

The system administrator is allowed to select a timespan to view the fetched Key Performance Indicators(KPI) Timespan:

- 6 months
- 12 months
- 24 months

#### **App Permissions:**

Permission: View

Scope: System Analysis

#### **Target Audience:**

System administrators

#### **Pre-conditions:**

1. The system must be operational.
2. The user must have administrative privileges.
3. The user is required to be currently logged in and authenticated on their device.
4. The Usage Analysis Dashboard must be accessible.
5. The user must be on the Usage Analysis Dashboard view.

#### **Success Outcome(s):**

- The system securely retrieves data from the internal data store for the specified time spans (6, 12, and 24 months), including login attempts, registration statistics, page visit durations, and feature usage metrics.
- Data retrieval and processing are optimized for efficiency to guarantee that the data dashboard loads within 15 seconds.

- Key Performance Indicators (KPIs):
  - Track the number of successful and failed login attempts per month for the selected time span, represented in a trend chart.
  - Track the number of successful and failed registrations per month over the chosen time span, presented in a trend chart.
  - Highlight the top 3 longest page visits in seconds.
  - Highlight the top 3 most used features.
  - Include two application-specific feature metrics.
- The dashboard view must load within 3 seconds after the user's navigation is complete.
- The operation of this feature must not compromise the overall system's stability or result in system downtime.
- The system processes the collected data and calculates KPIs. These KPIs are prepared for presentation in the front-end.
- System administrators can access the Usage Analysis Dashboard from their accounts. The dashboard presents selectable time spans of 6, 12, and 24 months for analysis.
- The dashboard displays KPIs in a user-friendly and intuitive format. KPIs include trends for successful and failed login attempts, successful and failed registrations, top 3 longest page visits, top 3 most used features, and two application-specific feature metrics.
- KPI data automatically refreshes by querying data every 60 seconds, ensuring that administrators have access to up-to-date insights.
- Successful Usage Analysis Dashboard view is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - User: User's Username
  - Log Level: Info
  - Category: Data store
  - Description: "Usage Analysis Dashboard view displayed correctly"

### ***Failure Outcome(s):***

- System administrators are unable to access the Usage Analysis Dashboard view, it is not recoverable since it is out of the user's control.
- System administrators are able to access the Usage Analysis Dashboard view, but the view fails to load within 3 seconds upon navigation completion. System will log default "Time Limit for Operation Exceeded".
- Key Performance Indicators (KPIs):
  - Do not track the number of successful and failed login attempts per month for the selected time span, represented in a trend chart.
  - Do not track the number of successful and failed registrations per month over the chosen time span, presented in a trend chart.
  - Do not highlight the top 3 longest page visits in seconds.
  - Do not highlight the top 3 most used features.
  - Do not include two application-specific feature metrics.
- KPI data must be automatically refreshed at regular intervals of 60 seconds to ensure that the insights are up-to-date.
- The dashboard view must load within 3 seconds after the user's navigation is complete. System will log default "Time Limit for Operation Exceeded"
- The operation of this feature must not compromise the overall system's stability or result in system downtime.
- Failure to track the number of successful and failed login attempts for a selected time span, it is not recoverable since it is out of the user's control.
- Failure to track the number of successful and failed registrations per month for their chosen time span, it is not recoverable since it is out of the user's control.
- If KPI data processing fails, leading to inaccurate KPI information, it is not recoverable since it is out of the user's control.
- Failure to highlight the top 3 most used features might be recoverable if its results were refreshed.



- If all KPI data is not refreshed every 60 seconds, it is not recoverable since it is out of the user's control.

#### **Timeout length of 60.1 seconds - 62.0 seconds**

KPI data refresh time falls within this range is considered tolerable and will produce a 'Warning' log but is still treated as a successful outcome.

- Error is logged with the following data:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42 AM
  - Log Level: Warning
  - User: [User's username]
  - Category: Business
  - Description: "KPI data refresh took longer than 60 seconds"

#### **Timeout length of 62.1 seconds or more**

A response time that falls within this range is considered unacceptable, will produce an 'Error' log and be treated as a failure outcome.

- System will display the following message: "System timeout error"
- Error is logged with the following data:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42 AM
  - Log Level: Error
  - User: [User's username]
  - Category: Business
  - Description: "KPI data refresh timed out "

#### **Logging:**

##### **1. LOG - 01 (Effort Points [Hours]: 40) (Complexity : Medium)**

As a system administrator, I want to ensure that all system events and user activities are accurately logged for auditing purposes.

#### ***App Permissions:***

Permission: Create

Scope: Logs

#### ***Target Audience:***

System administrators

#### ***Pre-conditions:***

1. The system must be operational.
2. The persistent data store must be active.

3. The user must have administrative privileges.
4. Persistent data store must be accessible from the system.
5. Persistent data store must have storage capacity to log entries.

**Success Outcome(s):**

1. The system accurately logs system success events within the user interface, ensuring that users can view the history of such events.
2. The system accurately logs system failure events within the user interface, allowing system maintainers and administrators to track and address these issues.
3. The system accurately logs user success events within the user interface. Users can access records of their successful interactions and operations.
4. User failure events, when they occur, are accurately logged within the user interface. Users can review and understand unsuccessful interactions.
5. Log entries must be saved to a persistent data store for long-term record-keeping and auditing purposes.
6. Each log entry must contain the following components:
  - The exact date and time when the event occurred in Coordinated Universal Time (UTC).
    - yyyy-MM-dd HH:mm (UTC)
    - i.e,2023-11-17 10:42
  - A classification indicating the severity of the event, such as Info, Debug, Warning, or Error.
  - If the User's username was involved in the event is known, the log entry will include details about that User's username. Otherwise if the User's username is not known it will be 'null'
  - The category of the event, categorizing it as View, Business, Server, Data, or Data Store.
  - A description or message explaining the event, its context, or its significance.
7. All log entries are stored in an immutable format to ensure that they cannot be altered once logged.

8. The logging process must be complete within 3 seconds upon invocation.
9. System failures from this logging feature must not result in the system going offline or becoming unresponsive.

***Failure Outcome(s):***

1. The logging process, upon invocation, takes longer than 3 seconds to complete. As a result, users may experience delays when attempting to access or view log entries within the system.
2. The logging process unexpectedly blocks a user from interacting with the system. This issue can result in user frustration and hinder their ability to use the system smoothly.
3. The logging process completes within 3 seconds, but it fails to save the logged events to the persistent data store.
4. Log entries are not saved to a persistent data store for long-term record-keeping and auditing purposes.
5. Each log entry does not contain the following components:
  - Inaccurate or no exact date and time when the event occurred in Coordinated Universal Time (UTC).
  - Inaccurate or no classification indicating the severity of the event, such as Info, Debug, Warning, or Error.
  - Inaccurate User's username was involved in the event is known or 'null' if not known.
  - Inaccurate or no category of the event, categorizing it as View, Business, Server, Data, or Data Store.
  - Inaccurate or no description or message explaining the event, its context, or its significance.
6. All log entries are not stored in an immutable format and can be altered once logged.
7. The logging process is not completed within 3 seconds upon invocation.
8. System failures from this logging feature result in the system going offline or becoming unresponsive.

9. Although the logging process finishes within the expected time frame (3 seconds), it does not accurately save the logged events to the persistent data store. Accuracy includes details like timestamp, log level, category, message, and context of the event
10. Previously saved log entries are found to be modifiable.

**Archiving:**

**1. ARC-01 (Effort Points [Hours]: 20):**

As a system administrator, I want to archive old log entries, so I can preserve system resources.

***App Permissions:***

Permission: Archive

Scope: System Administration

**Target Audience:**

System administrators

**Pre-conditions:**

1. The system must be operational.
2. The user must have administrative privileges.
3. The user is required to be currently authenticated on their device.
4. Archival destination must have the necessary storage space.

**Success Outcome(s):**

- The system initiates the archiving process as scheduled.
- The archival Process executes the archiving of log entries
- Archiving process executes successfully at 00:00:00 AM (PST) on the 1st of the month.
- Log entries older than 30 days are offloaded.
- Archived log entries are consolidated and compressed.
- Log entries are removed from the primary log database.
- The entire archiving process is completed within 60 seconds upon invocation.
- Logs are stored in the specified destination location.

**Failure Outcome(s):**

- The scheduled archival process failed to commence at the specified time of 00:00:00 AM, potentially resulting in data not being archived as required.
- Although the archival process initiated at 00:00:00 AM, it didn't consider the local time zone, which can lead to inconsistencies in data management.
- Even though the process began at 00:00:00 AM (in the local time zone), it failed to occur on the designated 1st day of the month, potentially causing issues in data management.
- The archival process, which started at 00:00:00 AM on the 1st of the month, failed to archive any log entries, even though there are logs older than 30 days. This is crucial for efficient data management.
- Despite starting correctly, the archival process failed to archive all log entries older than 30 days, potentially causing data clutter.
- Although the process commenced, it failed to consolidate log entries older than 30 days, which could lead to inefficiencies in data storage.
- The archival process initiated at 00:00:00 AM on the 1st of the month, consolidated the data, but did not compress it. This may lead to increased storage requirements.
- The process began correctly, consolidated and compressed the data, but it didn't successfully relocate the archived data to the designated location, impacting data management.
- While the archival process archived, compressed, and relocated the data, it failed to remove the archived logs from the system, causing potential redundancy.
- The archival process exceeded the 60-second time limit during execution, leading to potential delays in system maintenance.

## Space Manager

### Reservable Space Creator:

#### **1. RSC - 01 (Effort Points [Hours] : 70) (Complexity: Medium - High)**

As an authenticated Company Manager, I want to have the capability to upload images of my offices' floor plans to the platform, so that I can provide clear spatial layouts to employees, enhancing their ability to navigate through the office spaces.

#### **2. RSC - 02 (Effort Points [Hours] : 10) (Complexity: Low - Medium)**

As an authenticated Public Facility Manager, I want to be able to upload an image of my facility's floor plan, so that users can have accessible visual guides, which assist in easy navigation.

### **Required Input(s):**

User inputs are required in order to provide a visual representation of the space layout. This aids in better understanding, navigation, and utilization of the space by employees, visitors, or users of the facility.

- "Upload floor plan" request
- Floor plan image
  - Valid image type: JPEG or PNG
  - Max size: 0.5 MB
  - One image can be uploaded at a time
    - One file per upload only
  - Image must be labeled with space ID on each individual available space
    - Space ID must be unique to floor plan
    - System assumes that manager has labeled the floor plan image, no verification is necessary
- Image name
  - Must be unique within the company
    - For example, a company cannot have two floor plans in building with the same name
  - Valid Input:
    - Min : 2 characters
    - Max: 50 characters
    - a - z
    - A - Z
    - 0 - 9
  - Invalid Characters:
    - Any special characters
    - Spaces

**App Permissions:**

Permission: Create

Scope: Floor plan

**Target Audience:**

Company Manager or Public Facility Manager responsible for managing office spaces and resources.

**Pre-conditions:**

1. Managers must be logged into SpaceSurfer
2. Managers must be on Space Manager view

**Success Outcome(s):**

- Upon “Upload Floor Plan” request, manager will be able to select floor plan file from file explorer on device
- Valid image name is added to data store within 3 seconds of submission
- Valid image file is uploaded to server within 3 seconds of submission
- Success message “Floor plan has been uploaded. If information is not displayed please resubmit inputs.” will be displayed within 3 seconds of successful submission of floor plan creator form
- Image and image name are uploaded onto company/facility view in “Space Booking Center” within 3 seconds of submission of the floor plan creator form
  - Floor plan name with corresponding image underneath
  - If there are multiple images per company/facility, they will be displayed in order of latest to earliest
  - Operation is logged
    - Timestamp of successful upload:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Info
    - User: [User's username]
    - Category: Data store
    - Description: “Successful submission of floor plan file”

### **Failure Outcome(s):**

- Device file explorer does not display after user requests to upload a floor plan. This is a non-recoverable issue, the system cannot detect error, as it is out of application scope.
- Image name and/or image file inputs are invalid
  - System will display the following message “Invalid user inputs, please try again for successful submission”Error is logged with the following data:
  - Timestamp of error :
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Manager attempted to submit invalid forms of image name/file”
- Success message “Floor plan has been uploaded. If information is not displayed please resubmit inputs.” takes longer than 3 seconds to be displayed from the moment the manager submitted valid inputs. This is non-recoverable, the system would not know the message was not displayed.
- Success message “Floor plan has been uploaded. If information is not displayed please resubmit inputs” is never displayed. This is non-recoverable, the system would not know the message was not displayed.
- Image is not uploaded to the server but marked the operation as a failure. System will display the following message “Come back later”  
Error is logged with the following data:
  - Timestamp of error :
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Floor plan image was not uploaded to server”
- Image takes longer than 3 seconds to be uploaded to the server. System will log default “Time Limit for Operation Exceeded”.
- Image name is not added to the data store and the data store marks the operation as a success. This is a non-recoverable issue, the data is lost



- Image name is not added to the data store and the data store marks the operation as a failure. The system will output the following message “Operation was not saved, please try again later.”
  - Error to modify reservation is logged with the following data
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: warning
    - User: [User's username]
    - Category: Data Store
    - Description: “failed to save to data store”
- Image name takes longer than 3 seconds to be added to the data store. System will log default “Time Limit for Operation Exceeded”.
- Image name is inaccurately added to the data store. This is a non-recoverable issue, the system cannot detect error
- Image and image name are not displayed accurately on company/facility page in “Space Booking Center”
  - Floor plan name is not displayed, but image is
  - Floor plan name is displayed, but image is not
  - Floor plan name and image are not displayed
  - Floor plan name and image are viewable to manager that submitted, however is not viewable to other valid users
  - If there are multiple images per company/facility, they are not displayed in order of latest to earliest

This is a nonrecoverable issue, the system cannot detect error.

- Image and image name take longer than 3 seconds to be displayed on the “Space Booking Center” view. System will log default “Time Limit for Operation Exceeded”.
- Failed upload information because the data store is offline. The system will output the following message: “Data store is not able to save changes right now, please come back later.”
 

Error to upload image is logged

  - Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data store
  - Description: “Data store is offline, cannot accept data”

## **List of Reservable Spaces:**

### **1. LRS -01 (Effort Points [Hours] : 50) (Complexity: Medium)**

As an authenticated Company Manager, I want to be able to create a list of reservable spaces that will be located below the floor plan image, so that users can easily identify, select, and reserve office spaces.

### **2. LRS - 02 (Effort Points [Hours]: 10) (Complexity: Low)**

As an authenticated Company Manager, I want to be able to specify the time limit for each space I add, so that users are aware of the duration for which they can reserve a space and spaces are utilized in an orderly manner.

### **3. LRS -03 (Effort Points [Hours]: 10) (Complexity: Medium)**

As an authenticated Public Facility Manager, I want to be able to create a list of reservable spaces that will be located below the floor plan image, so that users can easily identify, select, and reserve available spaces efficiently.

### **4. LRS - 04 (Effort Points [Hours]: 10) (Complexity: Low)**

As an authenticated Public Facility Manager, I want to be able to specify the time limit for each space I add, so that users are aware of the duration for which they can reserve a space and spaces are utilized in an orderly manner.

## ***Required Input(s):***

User input is required to generate a list that accurately represents the available reservable spaces. This information ensures that the listed spaces are easily recognizable to users.

- Space ID
  - Valid Input:
    - Min: 2 characters
    - Max: 10 characters
    - a - z
    - A - Z
    - 0 - 9
  - Invalid Input:
    - Any special characters
    - Spaces
    - Cannot upload more than 50 spaces per floor plan
  - Space ID must match Space ID in floor plan image
    - System assumes that manager has labeled the floor plan image accurately, no verification is necessary
  - Each space ID must be unique to the company/facility

- Time limit
  - Minimum: 1 hour
  - Maximum : 12 hours
  - Valid Characters:
    - 0 - 9
    - Must be integers
  - Invalid Characters:
    - a - z
    - A - Z
    - Any special characters
  - System assumes all numbers entered represent hours

***App Permissions:***

Permission: Create

Scope: Reservable Space

***Target Audience:***

- Company Manager who wants to curate a list of available office and work spaces for employees to reserve
- Facility Manager who wants to curate a list of available spaces in facility

***Pre-conditions:***

1. Company/Facility manager must be logged in
2. Company/Facility manager must be on the Space Manager view
3. A PNG or JPEG image of the floor plan must be uploaded by manager

***Success Outcome(s):***

- Manager is unable to upload a reservable space if there is no valid floor plan image uploaded first
- Manager is able to upload up to 50 reservable spaces per floor plan
- Space IDs and corresponding time limits are added to the data store within 3 seconds of submission
- Success message “List of reservable spaces have been uploaded. If information is not displayed please resubmit inputs. ” is displayed within 3 seconds of successful submission
- List of spaces are displayed underneath the corresponding company/facility’s floor plan image in “Space Booking Center” view within 3 seconds of submission

- List of spaces are displayed in alphabetical order
- Space ID and Time limit are accurately added to the data store
  - Operation is logged with the following data:
    - Timestamp of successful submission:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Info
    - User: [User's username]
    - Category: Data store
    - Description: "Successful upload of reservable space "

### ***Failure Outcome(s):***

- System allows the user to submit a list of spaces before uploading the floor plan. The system will display: "You have submitted a list of reservable spaces without uploading a floor plan"

Error is logged with the following data:

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Warning
- User: [User's username]
- Category: Business
- Description: "User has uploaded a list of spaces before uploading a floor plan."

- System allows the user to submit more than 50 spaces total. The system will output the following message: "You can only upload up to 50 spaces per floor plan"

Error is logged with the following data:

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Error
- User: [User's username]
- Category: Data
- Description: "User has uploaded more than 50 spaces per floor plan."

- User attempts to submit list before uploading floor plan, but system does not allow
  - Error message will display "You must upload floor plan before listing spaces" will be displayed, and spaces will not be submitted

Error is logged with the following data:

- Timestamp of error:
  - Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Warning
- User: [User's username]
- Category: Business
- Description: "User has attempted to submit list of reservable spaces before uploading floor plan"

- Invalid space ID and/or time limit input
  - Error message will display “Invalid user inputs”, and spaces added will not be submitted

Error is logged with the following data:

  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Warning
  - User: [User's username]
  - Category: Data
  - Description: “Invalid space ID/ time limit input”
- Space ID and/or time limit are not added to the data store after successful upload. This is a non-recoverable issue, the data is lost.
- Space ID and/or time limit take longer than 3 seconds to be added to the data store after successful upload. System will log default “Time Limit for Operation Exceeded”.
- Space ID is not accurately added to the data store
  - Space ID is added, but the time limit is not
  - Time limit is added, but the space ID is not
  - Inputs are added, however they have no association to corresponding floor plan and company/facility data

This is a non-recoverable issue, the system cannot detect error.
- Success message “List of reservable spaces have been uploaded” is not displayed. This is a non-recoverable issue, the system cannot detect error.
- Success message “List of reservable spaces have been uploaded” is displayed after 3 seconds of successful upload. This is non-recoverable, the system would not know.
- List of spaces are not displayed on the “Space Booking Center” view. This is a non-recoverable issue, the system cannot detect error.
- List of spaces are displayed on the “Space Booking Center” view after 3 seconds of successful upload. System will log default “Time Limit for Operation Exceeded”
- List of spaces are not displayed properly underneath the corresponding company/facility’s floor plan image in “Space Booking Center” view
  - List of spaces are not shown in alphabetical order after successful submission
  - List of spaces are not displayed directly under floor plan name and image
  - List of spaces are viewable to manager that uploaded, however are not viewable to other valid users

This is a non-recoverable issue, the system cannot detect error.

- Failed to upload space ID and time limit reservation history because the data store is offline. The system will output the following message: “Data store is not able to save changes right now, please come back later.”

Error to upload list of reservable spaces is logged

- Timestamp of error:
- Date Time format : yyyy-MM-dd HH:mm (UTC)
- Log Level: Error
- User: [User's username]
- Category: Data store
- Description: “Data store is offline, cannot accept data”

### **Modify Reservable Spaces:**

#### **1. MRS -01 (Effort Points: 50)**

As an authenticated Company Manager, I want to be able to modify the list of reservable spaces that will be located below the floor plan image, so that I can ensure the list remains accurate and up-to-date, reflecting any changes in the availability or characteristics of spaces.

#### **2. MRS - 02 (Effort Points: 10)**

As an authenticated Company Manager I want to be able to modify the time limit for each space I add, so that users are informed of the maximum duration they can reserve a space for, fostering efficient scheduling and usage of spaces.

#### **3. MRS -03 (Effort Points: 20)**

As an authenticated Public Facility Manager, I want to be able to modify the list of reservable spaces that will be located below the floor plan image, so that I can ensure the list remains accurate and up-to-date, reflecting any changes in the availability or characteristics of spaces.

#### **4. MRS - 04 (Effort Points: 10)**

As an authenticated Public Facility Manager, I want to be able to modify the time limit for each space I add, so that users are informed of the maximum duration they can reserve a space for, fostering efficient scheduling and usage of spaces.

### ***Optional Input(s):***

User inputs are optional to modify the reservable space that accurately represents the available reservable spaces. This information allows for adaptive space management, accommodating for alterations in the physical layout or reservation policies of the spaces over time.

- Delete Space ID
  - Must be no ongoing reservation at the time that manager requests to delete space

- **Modify time limit**
  - Must be no ongoing reservation at the time that manager requests to modify space time limit
  - Minimum: 1 hour
  - Maximum : 12 hours
  - Valid Characters:
    - 0 - 9
  - Invalid Characters:
    - a - z
    - A - Z
    - All special character symbols
  - System assumes all numbers entered represent hours
- **Replace image floor plan**
  - Must be no ongoing reservation at the time that manager requests to replace floor plan
  - Floor plan image
    - Valid Image Type: JPEG or PNG
    - Max size: 0.5 MB
    - One image can be uploaded at a time
    - Image must be labeled with space ID on each individual available space
      - Space ID must be unique to floor plan
  - Image name
    - Must be unique within the company
      - For example, a company cannot have two floor plans in building with the same name
    - Valid Input:
      - Min : 2 characters
      - Max: 50 characters
      - a - z
      - A - Z
      - 0 - 9
    - Invalid Characters:
      - Special characters
      - Spaces
- **Delete image floor plan**
  - Must be no ongoing reservation for space manager requests to delete
  - This will also delete corresponding list of reservable spaces

## ***App Permissions***

### **For MRS - 01 and MRS - 03:**

- Permission: Modify  
Scope: Reservable spaces
- Permission: Delete  
Scope: Reservable spaces

### **For MRS - 02 and MRS - 04:**

- Permission: Modify  
Scope: time limit

## ***Target Audience***

Company or Facility Manager who wants to modify or delete the available spaces for users to reserve

## ***Pre-conditions***

1. Manager must be logged in
2. Manager must have already uploaded floor plan image and list of reservable spaces
3. There must be no ongoing reservations for space in facility at the time of modification/deletion
4. Manager must be in "Space Manager" view

## ***Success Outcome(s):***

- Success message "Successfully modified space" will be displayed within 3 seconds from the moment of submitting the modification form
- Time limit is updated in the data store within 3 seconds from the moment of submitting the modification form
- Image name is updated in the data store within 3 seconds of successful submission
- Image is updated to server within 3 seconds of successful submission
- Deletion of image floor plan also deletes list of reservable spaces
  - All data associated will be deleted from data store
- System does not allow manager to modify or delete any information if there is an ongoing reservation associated with corresponding space



- Operation is logged
  - Timestamp of successful upload:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Successful modification of reservable space "

**Failure Outcome(s):**

- Modification request is associated with a reservation that has not been completed. System will display "User has reserved a space under this floor plan. Please contact the user or wait until the reservation is complete."  
Error is logged:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Warning
  - User: [User's username]
  - Category: Data
  - Description: "User attempted to modify space that has an ongoing reservation"
- System allows manager to submit modifications, despite it being associated with a reservation that has not been completed. Reservation will automatically be cancelled.  
Error is logged:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Warning
  - User: [User's username]
  - Category: Data
  - Description: "User has modified a space that has an ongoing reservation"
- Success message "Successfully modified space" is not displayed after successful submission. This is a non-recoverable issue, the system cannot detect error
- Submission is successful, however the updated information is not accurate.  
Inaccurate time limit
  - Inaccurate floor plan image display
  - Inaccurate floor plan name
 This is a non-recoverable issue, the system cannot detect error
- Modified information is not updated in the data store. This is a non-recoverable issue, the system cannot detect error
- Modified information takes longer than 3 seconds to be updated in the data store from the moment the manager submitted inputs. System will log default "Time Limit for Operation Exceeded".

- Invalid user modification inputs
  - System will display the following message “Invalid user inputs, please try again with valid inputs”, and information modified will not be submitted

Error is logged with the following data:

  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “User modification inputs are invalid.”
- Time limit is not added to the data store. This is a non-recoverable issue, the system cannot detect error
- Time limit is added to the data store after 3 seconds of successful submission. System will log default “Time Limit for Operation Exceeded”.
- Time limit is inaccurately added to the data store. This is a non-recoverable issue, the system cannot detect error
- Image name is not updated in the data store after successful submission. This is a non-recoverable issue, the system cannot detect error
- Image name takes longer than 3 seconds to be updated in the data store from the moment the manager submitted modification inputs. System will log default “Time Limit for Operation Exceeded”.
- Image is not replaced after successful submission. This is a non-recoverable issue, the system cannot detect error
- Image takes longer than 3 seconds to be replaced in the server from the moment the manager submitted the new floor plan form. System will log default “Time Limit for Operation Exceeded”.
- Deletion of image floor plan does not delete corresponding list of reservable spaces. This is a non-recoverable issue, the system cannot detect error
- Failed to retrieve reservation history because the data store is offline. The system will output the following message: “Data store is offline, please come back later.”
 

Error to modify reservable spaces is logged with the following data:

  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data store
  - Description: “Data store is offline, cannot accept data”

## Space Booking Center

### Availability Display for Reservable Spaces:

#### 1. **ADRS - 01 (Effort Points [Hours]: 35) (Complexity: High)**

As an authenticated user, I want to see visual indicators on the view of spaces that clearly distinguish between available and occupied spaces so that it is easier to find an available space to reserve.

#### **App Permissions**

- Permission: View  
Scope: Space Availability

#### **Target Audience**

All users that wish to see the availability of spots within a floor plan

#### **Pre-conditions**

1. Authenticated user must be logged in an active session
2. Authenticated user must be on “Space Booking Center” view
3. Authenticated user must in the process of reserving a space
4. Authenticated user must select the place from where they want to reserve a space

#### **Success Outcome(s):**

- Display for reservable spaces that contain the visual indicators is shown within 3 seconds
- Spaces have a visual indicator based on their availability for the reservation time
  - green for available
  - red for occupied
- Visual Indicator is accurate to the data in the data store
- The system correctly displays all of the reserved time slots for the space with the following information
  - Start Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - End Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM

- Successful and display of space availability logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Business
  - Description: "Availability displayed correctly"

**Failure Outcome(s):**

- Display for reservable spaces that contain the visual indicators is shown 3 seconds after the moment of selecting the specified Facility/Company. System will log default "Time Limit for Operation Exceeded"
- Display for reservable spaces does not display at all. This is non recoverable, the system would not know.
- Display for reservable spaces is blank. This is non recoverable, the system would not know.
- Inaccurate availability data and reservation schedules are displayed. This is non recoverable since the system would have no way to detect wrong data.
- The visual indicator based on their availability for the reservation time is incorrect
  - Available spaces are not green
  - Occupied spaces are not red
  - There is no visual indicator
 This is non recoverable because the system would not detect the incorrect colors.
- The system inaccurately displays at least one of the following information for any of the reserved time slots in the display
  - Inaccurate or no Start Date Time format not yyyy-MM-dd hh:mm AM/PM (PST) i.e, 2023-11-17 10:42 AM
  - Inaccurate or no End Date and Time format not yyyy-MM-dd hh:mm AM/PM (PST) i.e, 2023-11-17 10:42 AM
 This is non recoverable, the system would not know.
- The system displays no reservation time slots for the space when there are existing reservation time slots. This is non recoverable, the data was not recorded.
- The system displays reserved time slots when there are no existing reservation time slots. This is non recoverable, the data is false.

- Failed to show accurate space availability because the database is offline. The system will output the following message: “Database is offline, please come back later.”
  - Error to display spaces is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Data store is offline, cannot retrieve data”

### **Space Reservation:**

#### **1. SR - 01 (Effort Points [Hours] : 60) (Complexity: High)**

As an authenticated user, I want the ability to reserve a specific space from the list of available spaces showcased on the view, ensuring I have access to the space when needed.

### ***Required User Inputs***

Authorized user inputs are required in order to accurately specify their space needs and schedule their space reservation time

- Space selection from list
  - Select desired Space ID
- Reservation time frame
  - Start Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
    - Date: yyyy-MM-dd format
    - Time: hh:mm format
    - AM/PM selection
    - Start time must be after current time and date of submission
    - Can only be booked at most one week in advance
    - Start time cannot interfere with another reservation
  - End Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
    - Date: yyyy-MM-dd format
    - Time: hh:mm format
    - AM/PM selection
    - End date must be at least one hour after start time
  - Time slot must be at least one hour long but no longer than 12 hours
  - Time slot must not interfere with any other reserved time slots
  - Time slot must be within company/facility hours

### ***App Permissions***

Permission: Reserve

Scope: Reservable Space

### ***Target Audience***

Authenticated users that wish to reserve a space

### ***Pre-conditions***

1. Authenticated user must be logged in an active session
2. Authenticated user must be on “Space Booking Center” view
3. Authenticated user must select the facility they choose to reserve a space from

### ***Success Outcome(s):***

- The complete list of available spaces at the selected company or facility is accurately displayed to the user from the data store
- The system correctly records the reservation details in the data store within 3 seconds from the moment of submitting the new reservation form.
  - Name of Company or Facility selected
  - Chosen Space ID
  - Start Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - End Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Authorized User's username that submitted reservation
- The spaces in data store updates to reflect the new availability of the chosen space within 3 seconds from the moment of submitting the new reservation form.
  - System marks space as occupied for specified reserved time
- System doesn't allow submission of a reservation that overlaps with another reservation's time frame
- Confirmation message of reservation information is displayed in the following order:
  - Name of Company or Facility selected
  - Chosen Space ID
  - Start Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - End Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Authorized User's username that submitted reservation
  - “Please confirm the reservation was created by checking you personal overview center”

- Operation is logged after successful submission
  - Timestamp of successful new reservation:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Made a successful reservation of space."

#### **Failure Outcome(s):**

- List of spaces are not accurately displayed for the corresponding company/facility
  - Invalid Spaces
  - Inaccurate availability

This is non-recoverable because there is no way for the system to know
- Reservation details are not created in the data store at all. This is a non-recoverable issue, the data is lost.
- Reservation details are created in the data store after 3 seconds from the moment of submitting the modification form. System will log default "Time Limit for Operation Exceeded".
- Reservation details are created in the data store within 3 seconds from the moment of submitting the new reservation form, however any one or more of the following information is inaccurate.
  - Inaccurate Company/Facility selected
  - Inaccurate Chosen space
  - Inaccurate Start Date Time format not yyyy-MM-dd HH:mm (UTC)
  - Inaccurate End Date and Time format not yyyy-MM-dd HH:mm (UTC)
  - Inaccurate username

This is non-recoverable, the system would not know the data is inaccurate

- The user inputs data that is invalid such as the following
  - Invalid or no chosen space ID
  - Invalid Start/End Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Start time is not after current time and date of submission
  - Space booked more than one week in advance
  - Start time interferes with another reservation
  - End date is not at least one hour after start time. The System will output the following message "Invalid data, please try again".
  - Error to create reservation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data
    - Description: "Invalid data inputted"

- Space's schedule takes longer than 3 seconds to update from the moment of submitting the new reservation form. System will log default "Time Limit for Operation Exceeded".
- Space's schedule does not update after submitting the new reservation form but the system flagged the reservation as success. This is a non-recoverable issue, the data is lost and it is out of the user's control.
- Space's schedule does not update after submitting the reservation form but the system flagged the reservation as a failure. The system will output the following message "The reservation was not saved, please try again later."
- Confirmation Email message that includes the following data of reservation is inaccurately shown or not shown at all
  - Inaccurate Company/Facility selected
  - Inaccurate Chosen space
  - Inaccurate Start Date Time format not yyyy-MM-dd hh:mm AM/PM (PST) i.e, 2023-11-17 10:42 AM
  - Inaccurate End Date and Time format not yyyy-MM-dd hh:mm AM/PM (PST) i.e, 2023-11-17 10:42 AM
  - Inaccurate username

This is a non-recoverable issue, the system would not know.

- Confirmation email message that includes the data of reservation is not sent. This is a non-recoverable issue, the system would not know.
- Confirmation email message that includes the data of reservation is sent after 3 seconds from the moment of submitting the new reservation form. This is a non-recoverable issue, the system would not know.
- Failed to create new reservation space because the database is offline. The system will output the following message: "Database is not able to save changes right now, please come back later."
  - Error to create reservation is logged
    - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: "Data store is offline, cannot accept data"
- Failed to load the New Reservation view. The system will output the message "View cannot be loaded right now, please come back later."



## **Cancel Reservations:**

### **1. CR - 01 ( Effort points [Hours] : 25) (Complexity: Low to Medium)**

As an authenticated user, I want the ability to cancel my existing reservations at a facility, ensuring I can cancel before my reservation time based on changing needs.

## ***Required User Input(s):***

These inputs are required so that it is clear which reservation the user wants to modify and how so that it is flexible with their schedule

- Authenticated User must choose which reservation to cancel from their Personal Overview Center
- Authenticated User must confirm the cancellation of the selected reservation
  - For CR - 01, authorized users are able to choose to cancel a space reservation

## ***App Permissions***

Permission: Cancel

Scope: Reservations

## ***Target Audience***

Users that wish to cancel existing space reservations

## ***Pre-conditions***

1. User must be registered
2. User must be Logged in
3. User must have an existing reservation
4. User must be in their personal overview view

## ***Success Outcome(s):***

- System displays message of the reservation the user chose to cancel to Confirm with the following format:
  - “ Are you sure you want to cancel this reservation?”
  - Reservation type name
    - Space ID
  - Cancelled Reservation’s Start Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Cancelled End Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Authorized User's username that submitted reservation

- System returns to Personal Overview Center if they decided to not continue with the cancellation process
- The data store updates to reflect the new availability status of the reserved space within 3 seconds from the moment of submitting the modification form.
  - Marks space as available for previous specified reserved time
- The updated list of available spaces is correctly displayed to the user within 3 seconds of the request
  - Space booked is up to date and reflected in schedule
- The system removes reservation details in the database within 3 seconds
- System will display a message to the user saying “Cancellation Successful”
- After reservation is removed from Data : Successful reservation cancelation is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: “successful in cancelling reservation”

#### ***Failure Outcome(s):***

- The database still contains the deleted reservation. The system will output the following message: “Deletion failed, please try again.”
- Space’s schedule takes longer than 3 seconds to update from the moment of submitting the modification. This is non-recoverable, the system wouldn't know.
- The database takes longer than 3 seconds to remove the reservation. System will log default “Time Limit for Operation Exceeded”.
- The database does not completely remove all of the following details related to the reservation and marks the operation as a failure
  - remaining Company/Facility name
  - remaining Space ID
  - remaining Start Date and Time
  - remaining End Date and Time
  - remaining user username

The System will output the following message: “Please try cancellation again”

- The database does not completely remove all the details related to the reservation and marks the operation as a success. This is non-recoverable, the system has marked the operation as a success so we wouldn't know what information remains.
- System does not show the Personal Overview Center view if the user who initiated the cancellation process decides to not continue the operation. This is non-recoverable, the system will not know if the view is shown or not.
- Confirmation message of reservation in cancellation process contains any of the following inaccurate information:
  - Inaccurate or no Company/Facility name
  - Inaccurate or no Chosen Reservation
  - Inaccurate or no Start/ Pick Up Date and time
  - Inaccurate or no End/Return Date and time
  - Inaccurate or no username

This is non-recoverable, system can't detect error
- Cancelled reservation details are not deleted in the data store after 3 seconds from the moment of submitting the cancellation form. System will display: "Cancellation took longer than expected, please confirm modifications in personal overview center"
  - Error to cancel reservation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Business
    - Description: "Data store is offline, cannot accept data"
- Space's reservation schedule in the Space booking center updates within 3 seconds but it is Inaccurate with the actual reserved times. This is non-recoverable since there is no longer reliable data and the system wouldn't know.
- Space's schedule does not update after submitting the cancellation form but the system flagged the modification as success. This is a non-recoverable issue, the data is lost and it is out of the user's control.
- Space's schedule does not update after submitting the cancellation form but the system flagged the modification as a failure. The system will output the following message "The cancellation was not saved, please try again later."
  - Error to cancel reservation is logged
    - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: "Could not update data"

- Failed to cancel space because the database is offline. The system will output the following message “Database if not able to save changes right now, please come back later.”
  - Error to cancel reservation is logged
    - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Could not update data”
- Message confirming a successful cancellation does not display. This is unrecoverable because the system would not know
- Error to cancel reservation is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: “Error cancelling reservation”

### **Modify Reservations:**

#### **1. MR - 01 (Effort points [Hours]: 35) (Complexity: Medium to High)**

As an authenticated user, I want the ability to modify my existing space reservations at a facility, ensuring I can adjust my plans before my reservation time based on changing needs.

### ***Required User Input(s):***

These inputs are required so that it is clear which reservation the user wants to modify and how so that it is flexible with their schedule

- User must choose which reservation to modify
  - User will be shown available times for that reservation including the time they reserved
- User must input the new start Date time or End Date time or both
  - Start Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
    - Date: yyyy-MM-dd format
    - Time: hh:mm format
    - AM/PM selection
    - Start time must be after current time and date of submission
    - Can only be booked at most one week in advance
    - Start time cannot interfere with another reservation

- End Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
    - Date: yyyy-MM-dd format
    - Time: hh:mm format
    - AM/PM selection
  - End date must be at least one hour after start time
  - Time slot must not interfere with any other reserved time slots
  - Time slot must be within company/facility hours
- If the time is available, authenticated user must confirm the modification of the selected reservation
  - If the time is not available, authenticated user must choose a different Start Date Time that is available

### ***App Permissions***

Permission: Modify

Scope: Reservations

### ***Target Audience***

Users that wish to make changes to existing reservations

### ***Pre-conditions***

1. User must be registered
2. User must be Logged in
3. User must have an existing reservation
4. User must access personal overview page

### ***Success Outcome(s):***

- The system correctly records and updates the reservation details in the data store within 3 seconds from the moment of submitting the modification form
  - name of chosen space
  - Modified Start Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Modified End Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Authorized User's username that submitted reservation

- Operation is logged after successful submission of modification form
  - Timestamp of successful submission:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Made a successful modification to the reservation of space [Reservation ID]."
- The updated list of available spaces is correctly displayed to the user within 3 seconds from the moment of submitting the modification form
  - Space reservations are current and reflected in displayed schedule
- Confirmation message of modified reservation information is shown with the following information
  - name of chosen space ID
  - Modified Start Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Modified End Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Authorized User's username that submitted modification form
- The system will output the following message "Please check your reservation details in your personal overview center, if it is incorrect cancel and rebook your reservation"
- Successful reservation modification is logged
  - Timestamp of modification for submission:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "successful in modifying reservation"

#### ***Failure Outcome(s):***

- Modified reservation details are not created in the data store at all. This is a non-recoverable issue, the data is lost.
- Modified reservation details are created in the data store after 3 seconds from the moment of submitting the modification form. System will log default "Time Limit for Operation Exceeded".

- Modified reservation details are created in the data store within 3 seconds from the moment of submitting the modification form, however any one or more of the following information is inaccurate.

- Inaccurate or no chosen space ID
- Inaccurate or no Start Date and Time
- Inaccurate or no End Date and Time

This is non-recoverable, the system would not know if the data is inaccurate.

- The user inputs data that is invalid such as the following
  - Invalid or no chosen space ID
  - Invalid modified Start Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Start time is not after current time and date of submission
  - booked more than one week in advance
  - Start time interferes with another reservation
  - Invalid modified End Date Time format : yyyy-MM-dd HH:mm (UTC) i.e, 2023-11-17 10:42
  - End date is not at least one hour after start time

The System will output the following message “Invalid data, please try again”.

- Error to modify reservation is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Invalid data inputted”

- The updated schedule of available spaces is not correctly displayed to the user.
  - Inaccurate or no name of chosen space ID
  - Inaccurate or no modified Start date and time
  - Inaccurate or no start Date and time format Date Time format : yyyy-MM-dd HH:mm (UTC) i.e, 2023-11-17 10:42
  - Inaccurate or no modified End Date and time
  - Inaccurate or no End Date and time format yyyy-MM-dd HH:mm (UTC)
  - Inaccurate or no authorized username that submitted modification form

This is non-recoverable, the system would nowt know the data is inaccurate.

- Space’s schedule takes longer than 3 seconds to update from the moment of submitting the modification form. System will log default “Time Limit for Operation Exceeded”.
- Space’s schedule does not update after submitting the modification form but the system flagged the modification as success. This is a non-recoverable issue, the data is lost and it is out of the user’s control.

- Space's schedule does not update after submitting the modification form but the system flagged the modification as a failure. The system will output the following message "The modification was not saved, please try again later."
  - Error to modify reservation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: "Error modifying reservation"
- Confirmation message that includes the following data of reservation is inaccurately shown or not shown at all
  - Inaccurate or no Chosen Reservation
  - Inaccurate or no Start/ Pick Up Date and time
  - Inaccurate or no End/Return Date and time
  - Inaccurate or no username

This is a non-recoverable issue, the system would not know.

- Failed to modify space because the database is offline. The system will output the following message: "Data store is not able to save changes right now, please come back later."
  - Error to modify reservation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: "Data store is offline, cannot accept data"
- Failed to load the Modify Reservations view. The system will output the message "View cannot be loaded right now, please come back later."
  - Error to modify reservation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Server
    - Description: "View cannot be loaded"



## Personal Overview Center

### **Overview of Reservations:**

#### **1. ORS - 1: (Effort Points [Hours]: 40) (Complexity: High)**

As an authenticated user, I want an overview of all the spaces and items I have currently reserved, so I can view all relevant reservations.

### ***Required User Input(s):***

Authenticated user is allowed to customize their search and retrieve the required information regarding their reservations based on the following user inputs:

- Authenticated user must select the viewing format between Calendar or List
- Authenticated user must confirm the selection

### ***Optional User Input(s):***

- The authenticated user can provide valid input for both the "From Date" and "To Date", following the format: yyyy-MM-dd (e.g., 2024-04-17).
- The authenticated user can select a category from the following options:
  - All (preset)
  - Spaces
  - Items

### ***App Permissions:***

Permission: View

Scope: Reservation Details

### ***Target Audience:***

- Authenticated users with current or previously reserved spaces or items.

### ***Pre-conditions:***

1. Unauthenticated users must be logged onto their SpaceSurfer account.
2. The associated account must have existing reservations to display; otherwise, there will be no data to show.
3. Authenticated users must access the "Personal Overview" view.
4. The platform offers users a choice of viewing format for their reservations.

### ***Success Outcome(s):***

- Authenticated users can successfully select and view their preferred viewing format, either Calendar or List.
- The system accurately retrieves existing reservation data associated with the user's account from the data store.
- If there is no prior or current reservation data, the system will display the message: "No previous or current reservations exist."

- Details of previous and current reservations are displayed in the preferred format, ordered from earliest to latest.
- Authenticated users can apply sorting methods, such as sorting by date or category criteria.
- The system correctly retrieves reservation data that matches the specified criteria from the data store.
- Authenticated users confirm their search filters, and updated reservation data is accurately presented according to their chosen filters and viewing format.
- Successful operation is logged with the following details
  - Timestamp of operation:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: "Personal overview was displayed by their preferred format"

#### ***Failure Outcome(s):***

- Data retrieval for reservation details takes longer than 3 seconds from the moment of submitting the reservation overview form. System will log default "Time Limit for Operation Exceeded".
- Inaccurate data is collected from the data store, resulting in inaccurate reservation details.
  - Inaccurate reservation information
    - Inaccurate provider name
    - Inaccurate Space ID
    - Inaccurate start date and time
    - Inaccurate end date and Time
    - Inaccurate username

This is non-recoverable, the system would not know if the data is inaccurate.

- Information for all reservation data is not displayed. This is a non-recoverable issue as it is typically beyond the user's control
- The user inputs data that is invalid such as the following:
  - Invalid Type Format
  - Invalid Confirm Selection
  - Invalid From & To Date
  - Invalid Categories

The System will output the following message "Invalid data, please try again".

- Data retrieval for filter based reservation details took longer than 3 seconds to update from the moment of submitting the filters. System will log default “Time Limit for Operation Exceeded”.
- Data is retrieved from the data store but not based on the filters specified by the user. This issue is non-recoverable the system would not know the data is inaccurate
- Data is collected from the data store with filtering, but not all reservations are displayed. This is not recoverable, the system would not know which reservations are not being displayed.
- Data is collected from the data store with filtering, but reservations outside of the filtering criteria are displayed. This is not recoverable, the system would not know which reservations are not being displayed.
- Data is collected from the data store with filtering, but only partial reservations are filtered. Alternatively, all reservations are filtered, resulting in an inaccurate view. This is not recoverable, the system would not know which reservations are not being displayed.
- Data is collected from the data store with filtering, but all reservations are filtered, rendering the view empty. This is not recoverable, the system would not know which reservations are not being displayed.

## Reservation Confirmation Email

### Confirmation Email:

#### **1. CE - 01 (Effort Points [Hours]: 50) (Complexity: Low-Med)**

As a registered user, I want to receive an email confirmation that includes the receipt and details of my reservation, so I can verify the reservation was placed correctly.

### **App Permissions**

Permission: Confirmation email

Scope: Reservable Space

### **Target Audience**

Registered users who have successfully submitted a reservation

### **Pre-conditions**

1. Registered users must be logged in to the platform beforehand.
2. A reservation must be placed.

### **Success Outcome(s):**

- Upon submitting a reservation, registered users will receive an email confirmation on the email address linked to the account.
- The email confirmation is received within 3 seconds
- A message is displayed with the following information:
  - Name of Company or Facility selected
  - Chosen Space ID
  - Start Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - End Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - "If you do not receive a confirmation with your reservation details please wait a few minutes and try again"
- The email is sent to the email address within one minute of the reservation submission.
  - A log entry is created with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Info
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Confirmation email sent successfully."

- Database is online to be able to retrieve data

### **Failure Outcome(s):**

- Registered user does not receive an email. This is non-recoverable because the system will not know if the user receives an email or not.
- Email contains missing or inaccurate information. This is non-recoverable because the system after sending the email cannot determine if the email received is blank or is missing any information.
  - Confirmation email can be sent with not information resulting in a blank email being sent
  - The confirmation email can be missing one or more of the following information and is not accurate if all are not shown:
    - Name of Company or Facility selected
    - Chosen Space ID
    - Start Date and Time
      - Format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - End Date and Time
      - Format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
- Retrieved data from the database resulted in inaccurate information. The system will output “Inaccurate Information. Please try again later.”
  - Inaccurate retrieval of data when processing inputted information of reservation details
    - Inaccurate or no chosen space ID
    - Inaccurate Space ID
    - Inaccurate or no Start Date and Time
    - Inaccurate Date Time
      - Format: yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Inaccurate or no End Date and Time
    - Inaccurate or no Date Time
      - Format: yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
  - Error to reservation confirmation email is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to retrieve data due to missing or inaccurate Information.”

- Retrieved data from the database resulted in inaccurate location information. This is non-recoverable due to the system not knowing whether or not the information retrieved from the database is accurate or not.
  - Inaccurate location information when retrieving information can result in a loss of address of location in which reservation takes place and will show general location
    - Ex: Irvine, California (General area of location instead of specified address of specific location)
- Confirmation email takes longer than 3 seconds of being submitted. System will log default “Time Limit for Operation Exceeded”.
- Email generation resulted in emails that are generated to the incorrect user email
  - As emails are being generated, possible minor changes in the sending of the email such as the user’s email address can be altered resulting in a change in user in which the email is being sent. The system will display an “Error generating email. Please request another confirmation email.” message on the screen.
  - Error to reservation confirmation email is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Confirmation email failed.”
- Failed to retrieve data because the database is offline. The system will output the following message: “Database is not able to process retrievals right now, please come back later.”
  - Error to reservation confirmation email is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to retrieve data. Database is offline.”

# PHASE 2 REQUIREMENTS

## Inventory Catalog

### Inventory Upload

#### 1. IU - 01 (*Effort Points [Hours]: 10*) (*Complexity: Low - Medium*)

As a registered and logged in Company Manager, I want to be able to upload a list of utilities or tools with a specified quantity so that my employees have access to reserve them

#### 2. IU - 02 (*Effort Points [Hours]: 10*) (*Complexity: Low - Medium*)

As a registered and logged in Company Manager, I want to be able to specified the quantity of each utility so that multiple employees can rent the same type of utility at a time

### ***Required User Input(s):***

Company Manager inputs are required in order to set up a clear and organized inventory Catalog that reflects available utilities for users.

- Utility Name
  - Type: String
  - Min: 1 character
  - Max: 100 characters
  - Valid characters:
    - lowercase alphabet a-z
    - Uppercase alphabet A-Z
    - Numbers 0-9
    - Special Characters: hyphens, spaces, parenthesis
  - Invalid Characters:
    - Symbols and punctuation marks (e.g., !, @, #, \$, %, ^, &, \*, \_ , +, =, [ , ], { , } , | , , : , ; , ' , < , > , ? , / , . , ~ , ` , etc.)
    - Non-ASCII characters or any character outside the standard ASCII range
- Quantity Available before any Reservations
  - Type: Integer
  - Valid Range: Greater than 0

### ***App Permissions:***

Permission: Create

Scope: Inventory Items

**Target Audience:**

Company Managers who plan to rent out utilities for their employees

**Pre-conditions:**

1. Company Managers must be logged onto their SpaceSurfer account using the Company manager layout
2. Company Managers must be on the Inventory Catalog view

**Success Outcome(s):**

- Utility Information created by company manager is accurately added to the data store with the following information
  - valid Utility Name
  - valid Utility Quantity
- Employees are able to view the uploaded utility in the inventory list with the following information:
  - Accurate Utility Name
  - Accurate Quantity available
- Changes are displayed inventory catalog within 3 seconds after inventory upload form submission
- Successful utility upload logged
  - User: utility name
  - Log Level: Info
  - Category: Data store
  - Description: "Successful utility upload"
  - Timestamp of successful utility upload
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42

**Failure Outcome(s):**

- Inventory utilities are not created in the data store at all. This is a non-recoverable issue, the data is lost.
- Utility in Inventory is created in the data store after 3 seconds from the moment of submitting the inventory upload form. System will log default "Time Limit for Operation Exceeded".
- Utility is added into the data store within 3 seconds from the moment of submitting the modification form, however any one or more of the following information is inaccurate
  - Inaccurate or no Utility Name
  - Inaccurate or no Quantity Available before any Reservations

This is non recoverable, the system would not know if the data is inaccurate.



- The user inputs data that is invalid such as the following:
  - Invalid Utility Name
  - Invalid Quantity Type

The System will output the following message “Invalid data, please try again”.

- Error to modify reservation is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Invalid data inputted”

- Utility is added into the Company’s Inventory list within 3 seconds but information is inaccurate:
  - Inaccurate Utility Name
  - Inaccurate Quantity

This is non recoverable, the system would not know if the data is inaccurate.

- Inventory Catalog does not upload after submitting the removal form but the system flagged the removal as success. This is a non-recoverable issue, the data is lost and it is out of the user’s control.
- Inventory Catalog does not upload after submitting the removal form but the system flagged the removal as a failure. The system will output the following message “The upload was not saved, please try again later.”
- Failed to upload utility because the database is offline. The system will output the following message: “Database is not able to save changes right now, please come back later.”
  - Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Data store is offline, cannot accept data”

## **Remove Inventory:**

### **1. RI - 01 (Effort Points [Hours]: 15) (Complexity: Medium to High)**

As an authenticated in Company Manager, I want to be able to remove items on the list of utilities my company offers so that it is consistently up to date and accurately reflects all the resources available

**Required User Input(s):**

Company Manager inputs are required in order to update the inventory Catalog that reflects available utilities for users.

- Authenticated Company Manager must choose which utility to remove
- Authenticated Company Manager must confirm the removal of the selected utility

**App Permissions:**

Permission: remove

Scope: Utility items in Company inventory

**Target Audience**

Company Managers who plan to rent out utilities for their employees and want to keep the list up to date.

**Pre-conditions:**

1. Company managers must be logged onto their SpaceSurfer account as a Company manger
2. The Inventory list must have must have at least one utility for it to be removed
3. Company Manager must confirm there's no reservations with utility before removing
4. Company Manager must be on the Inventory Catalog view

**Success Outcome(s):**

- The specified utility is removed from the datastore within 3 seconds from the moment of submitting the utility removal form.
- The updated list of available utilities is correctly displayed on the inventory catalog within 3 seconds from the moment of submitting the utility removal form.
- Confirmation message of removed utility is shown with the following information
  - Utility name
  - " Successfully removed"
- Successful utility upload is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - User: utility name
  - Log Level: Info
  - Category: Data store
  - Description: "Utility successfully removed"

### **Failure Outcome(s):**

- The database still contains the removed utility. The system will output the following message: "Deletion failed, please try again."
- Space's schedule takes longer than 3 seconds to remove the utility from the datastore from the moment of submitting the modification. System will log default "Time Limit for Operation Exceeded".
- Inventory Catalog does not update after submitting the removal form but the system flagged the removal as success. This is a non-recoverable issue, the data is lost and it is out of the user's control.
- Inventory Catalog does not update after submitting the removal form but the system flagged the removal as a failure. The system will output the following message "The removal was not saved, please try again later."
- The database does not completely remove any of the following data related to the specified utility after submitting the removal form and marking the operation as a success
  - Remaining Utility Name
  - Remaining Quantity

This is a non-recoverable issue, the data would not know the operation was a failure.

- Confirmation message of removed utility is inaccurately shown
  - Inaccurate or no Chosen Reservation
  - Inaccurate or no Start/ Pick Up Date and time
  - Inaccurate or no End/Return Date and time
  - Inaccurate or no User's username

This is a non-recoverable issue, the system believed the operation was a success.

- Confirmation message of the removed utility is not shown at all. This is a non-recoverable issue, the system would not know since it is a pop up.
- Failed to remove inventory because the database is offline. The system will output the following message: "Database is not able to save changes right now, please come back later."
  - Error is logged with the following data:
  - User: Utility name
  - Log Level: Error
  - Category: Data store
  - Description: "Could not remove utility from inventory"
  - Timestamp of failed utility removal
    - Date Time format : yyyy-MM-dd HH:mm (UTC)

## **Update Inventory:**

### **1. UI - 01 (Effort Points [Hours]: 15) (Complexity: Low - Medium)**

As an authenticated Company Manager, update the name of an item on the list of utilities my company offers so that it is consistently up to date and accurately reflects all the resources available

### **2. UI - 02 (Effort Points [Hours]: 15) (Complexity: Low - Medium)**

As an authenticated Company Manager, update the quantity of an item on the list of utilities my company offers so that it is consistently up to date and accurately reflects all the resources available

## ***Required User Input(s):***

Company Manager inputs are required in order to update the inventory Catalog that reflects available utilities for users.

- Company Manager must choose which utility on the company's inventory catalog to modify
- Modify Utility Name
  - Type: String
  - Min: 1 character
  - Max: 100 characters
  - Valid characters:
    - lowercase alphabet a-z
    - Uppercase alphabet A-Z
    - Numbers 0-9
    - Special Characters: hyphens, spaces, parenthesis
  - Invalid Characters:
    - Symbols and punctuation marks (e.g., !, @, #, \$, %, ^, &, \*, \_ , +, =, [ , ] , { , } , | , , ; , ' , < , > , ? , / , . , ~ , ` , etc.)
    - Non-ASCII characters or any character outside the standard ASCII range
- To modify Quantity Available
  - Type: Integer
  - Valid Range: Greater than 0
- Company Manager must confirm the modification of the selected utility

## ***App Permissions:***

Permission: Modify

Scope: Inventory items

**Target Audience:**

Company Managers who plan to rent out utilities for their employees and want to keep the list up to date.

**Pre-conditions:**

1. Company managers must be logged onto their SpaceSurfer account as a Company manger
2. The Inventory list must have must have at least one item for it to be modified
3. Company Manager must confirm there are no reservations associated with the utility before removing
4. Company Manager must be on the Inventory Catalog view

**Success Outcome(s):**

- The system correctly records and updates the reservation details in the data store within 3 seconds from the moment of submitting the utility update form with this information
  - Modified Utility Quantity
  - Modified Utility Name
- Employees and Company Managers are able to view the modified utility list in the utility catalog at most 3 seconds from the moment of submitting the inventory update form
- Confirmation message of modified utility information is shown in American English
  - Modified Utility Quantity
  - Modified Utility Name
  - “Please confirm the utility update details in the inventory catalog, if details are inaccurate, try again later”.
- Operation is logged after successful submission of modification form
  - Log Level: Info
  - User: utility name
  - Category: Data store
  - Description: “Made a successful modification to the utility.”
  - Timestamp of successful submission:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42

### **Failure Outcome(s):**

- Utility modification is not added into the data store but the system flagged the update as success. This is a non-recoverable issue, the data is lost and it is out of the user's control.
- Utility modification is not added into the data store but the system flagged the update as a failure. The system will output the following message "The modification was not saved, please try again later."
  - Error is logged with the following data:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: warning
    - User: [User's username]
    - Category: Data Store
    - Description: "failed to save to data store"
- Utility modification details are created in the data store after 3 seconds from the moment of submitting the update inventory form. System will log default "Time Limit for Operation Exceeded".
- Utility modification is added into the data store within 3 seconds from the moment of submitting the update inventory form, but the data is Inaccurate
  - Inaccurate or no Utility Quantity
  - Inaccurate or no Utility Name

This is non-recoverable, the system would not know.
- The user inputs data that is invalid such as the following
  - Invalid modified Utility Name
  - Invalid Quantity Available is not an integer type
  - Quantity Available is not an more than 0

The System will output the following message "Invalid data, please try again".

  - Error is logged with the following data:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data
    - Description: "Invalid data inputted"
- Failed to update inventory because the database is offline. The system will output the following message: "Database is not able to save changes right now, please come back later."

- Error is logged with the following data:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data store
  - Description: "Data store is offline, cannot accept data"
- Failed to load the update inventory view. The system will output the message "View cannot be loaded right now, please come back later."

### **Employee Inventory Reservation:**

#### **1. EIR - 01 (Effort Points [Hours]: 30) (Complexity: Medium to High )**

As an authenticated Employee, I want the ability to reserve available utilities from the inventory catalog, so that I can efficiently plan my tasks and projects

#### ***Required User Input(s):***

Employee inputs are required in order to accurately specify their utility needs, schedule their reservation start, and ensure a utility return date and time.

- Select desired utility from list
  - Examples: Monitor, HDMI cord, Fan ...
- Specify time frame
  - Start Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
    - Date: yyyy-MM-dd format
    - Time: hh:mm format
    - AM/PM selection
    - Start time must be after current time and date of submission
    - Can only be booked at most one week in advance
    - Start time cannot interfere with another reservation
  - End Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
    - Date: yyyy-MM-dd format
    - Time: hh:mm format
    - AM/PM selection
    - End date must be at least one hour after start time
  - Time between starting date and return date must be greater than one hour
  - Time between starting date and return date must be less than 30 days
  - Can only reserve up to a week in advance
  - Time slot must not negatively interfere with any other utility reservations

**App Permissions:**

Permission: reserve

Scope: utilities

**Target Audience:**

Authorized Employees that need or want to use any utilities available on Inventory Catalog that the company offers

**Pre-conditions:**

1. Authenticated Employee must be logged in an active session
2. Authenticated Employee must be on inventory catalog view

**Success Outcome(s):**

- The system correctly records the valid reservation details for the utility in the data store within 3 seconds from the moment of submitting the reservation form
  - Chosen Utility name
  - Modified Start Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Modified End Date and Time
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Authorized Employee username that submitted reservation
- The Inventory data store updates to reflect the new availability status of the reserved utility within 3 seconds from the moment of submitting the reservation form
  - Decrements quantity integer that indicates the number of available utility for specified time frame
  - Increments quantity integer that indicates the number of available utility when time frame is complete
- System doesn't allow submission of a reservation that forces another reservation's time frame to be negatively impacted or delayed
- Confirmation message of the utility reservation information is displayed in the following order:
  - Chosen utility name
  - Start Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)



- End Date and Time
    - Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Authorized User's username that submitted reservation
- The complete and updated list of available inventory is correctly displayed to the employee.
    - utilities accurately represent available date, times and quantities
    - utilities accurately represent unavailable date, times and quantities
  - Successful utility reservation logged
    - Timestamp of successful submission:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - User: User name
    - Log Level: Info
    - Category: Data store
    - Description: "Utility was reserved by user"

**Failure Outcome(s):**

- The reservation details are not created in the data store at all. This is a non-recoverable issue, the data is lost.
- The reservation details are created in the data store after 3 seconds from the moment of submitting the reservation form. System will log default "Time Limit for Operation Exceeded".
- The reservation details are created in the data store within 3 seconds from the moment of submitting the modification form, however any one or more of the following information is inaccurate.
  - Inaccurate or no utility name
  - Inaccurate or no Start Date and Time
  - Inaccurate or no End Date and Time
  - Inaccurate Authorized Employee username that submitted reservation

This is non-recoverable, the system would not know if the data is inaccurate
- The user inputs data that is invalid such as the following:
  - Invalid Chosen Utility name
  - Invalid Start Date and Time
  - Invalid End Date and Time
  - Time between starting date and return date it not greater than one hour
  - Time between starting date and return date is not less than 30 days
  - reserve more than a week in advance

The System will output the following message “Invalid data, please try again”.

- Error is logged with the following data:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Error
  - User: [User's username]
  - Category: Data
  - Description: “Invalid data inputted”
- List of utilities are not accurately displayed in the inventory catalog after a reservation
  - Does not decrement integer quantity of that available utility for specified time frame
  - Does not increment integer quantity when time frame is complete

This is non recoverable, the system would not know the data is inaccurate.
- Confirmation message that includes the following data of reservation is inaccurately shown or not shown at all:
  - Incorrect or no Chosen utility name
  - Inaccurate or no Start Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Inaccurate or no End Date Time format : yyyy-MM-dd hh:mm AM/PM (PST)
    - i.e, 2023-11-17 10:42 AM
  - Inaccurate or no authorized username that submitted reservation

This is a non-recoverable issue, the system would not know.
- Failed to make a reservation because the database is offline. The system will output the following message: “Database is not able to save changes right now, please come back later.”
  - Error is logged with the following data:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Data store is offline, cannot accept data”
- Failed to load the Inventory Reservation view. The system will output the message “View cannot be loaded right now, please come back later.”

## Check Reservation and Item History and Rebook

### 1. **CHR-1: (Effort Points [Hours]: 100) (Complexity: Medium)**

As a registered user, I want the capability to review the booking history and have the opportunity to rebook spaces that I have previously booked in the past, so I can save time from searching it through the platform.

#### **Required Input(s) for CHR-1:**

The registered user is allowed to customize their search and retrieve the required information from their reserved space or item based on the following user inputs:

Required:

- Type Format.
  - Calendar
  - List
- Selection of previous reserved space or item
- Enter new date and time, if applicable
- Confirm rebooking, if available

Optional:

- From & To Date
  - From Date format : yyyy-MM-dd
  - To Date format : yyyy-MM-dd ( must be after From Date)
- Categories
  - All (preset)
  - Spaces
  - Item

#### **App Permissions:**

Permission: Rebook

Scope: reservations

#### **Target Audience:**

Registered users who wish to rebook previously reserved spaces on the application

#### **Pre-conditions:**

1. The registered user must be logged into their SpaceSurfer account to access this feature.
2. Users must have a history of previous space or item reservations to view and rebook.
3. User must access Booking History page

#### **Success Outcome(s):**

- Authenticated users are able to select and view their preferred viewing format
  - Calendar
  - List

- Data of previous reservations associated with the authenticated user's account is accurately retrieved from the data store
- If there is no existing data of any previous reservations, then the system will display the following message “No previous reservation exists”
- Details of previous reservations are displayed in the format specified by the user who initiated the process.
- Reservations are displayed in order from oldest to most recent reservation
- Authenticated users have the option to apply the following sorting methods:
  - sort by date
  - sort by category criteria.
- The system accurately pulls the reservation history data that matches the specified criteria from the data store.
- Previous reservation data is accurately presented to the user according to their chosen filters and viewing format.
- Successful operation is logged with the following details
  - Timestamp of operation:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: “Personal overview or previous reservations were displayed by their preferred format”

#### ***Failure Outcome(s):***

- Failed to retrieve reservation history because the data store is offline. The system will output the following message: “Data store is not able to save changes right now, please come back later.”
  - Error is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Data store is offline, cannot accept data”

- Data retrieval for reservation history details took longer than 3 seconds from the moment of submitting the reservation overview form. System will log default “Time Limit for Operation Exceeded”.
- Inaccurate data is collected from the data store. These are the following:
  - Inaccurate reservation history information
    - Inaccurate provider name
    - Inaccurate Space ID
    - Inaccurate start date and time
    - Inaccurate end Date and Time
    - Inaccurate username

This is non-recoverable, the system would not know if the data is inaccurate.

- Information of all reservation history data is not being displayed accurately. This is a nonrecoverable issue, the system fails to display all reservation history data as expected, this issue is typically beyond the control of the user
- The user inputs data that is invalid such as the following
  - Invalid Type Format
  - Invalid Confirm Selection
  - Invalid From & To Date
  - Invalid Categories

The System will output the following message “Invalid data, please try again”.

- Data retrieval for reservation details update took longer than 3 seconds. This is non-re
- Inaccurate data may be collected from the data store based on the user inputs for filtering. These are the following:
  - Incorrect reservation information
    - Inaccurate provider name
      1. Company name
      2. Facility name
    - Inaccurate Space ID
    - Inaccurate start date and time
    - Inaccurate end Date and Time
    - Inaccurate username

This is a nonrecoverable issue, the system cannot detect error.

- Data is collected from the data store with filtering, but not all reservations in the user’s reservation history are displayed. This is not recoverable, the system would not know which reservations are not being displayed.
- Data is collected from the data store with filtering, but reservations in the user’s reservation history that are outside of the specified filter criteria are displayed. This is not recoverable, the system would not know which reservations are not displayed.

## Layout Selector

1. **RBL-01:** (Effort Points[Hours]: 30) (Medium Complexity)

As a Super Admin, I want the capability to switch the layout of the platform, so that it tailors to my needs as someone who manages the application, granting me the choice of choosing Super Admin, Company Manager, Public Facility Manager, Employee, or General User layouts.

2. **RBL-02:** (Effort Points[Hours]: 30) (Medium Complexity)

As a Company Manager, I want the capability to switch the layout of the platform, so that it accommodates my specific requirements for managing reservations within my company, allowing me to choose between Company Manager and Employee layouts.

3. **RBL-03:** (Effort Points: 30)

As a Public Facility Manager, I want the capability to switch the layout of the platform to suit the needs of managing reservations within my public facilities efficiently, allowing me to choose between Public Facility Manager or General User layouts.

### **Required Input(s):**

Selecting the preferred platform layout from the options available.

- Layout Selection
  - RSBL-01 Accessible Layouts:
    - Super Admin (preset)
    - Company Manager
    - Public Facility Manager
    - Employee
    - General User
  - RSBL-02 Accessible Layouts:
    - Company Manager (preset)
    - Employee
    - General User
  - RSBL-03 Accessible Layouts:
    - Public Facility Manager (preset)
    - General User
- Confirm Selection

### **App Permissions:**

#### **For RBL - 01:**

- Permission: Change Layout  
Scope: Screen Layout accessible to Super Admin

#### **For RBL - 02:**

- Permission: Change Layout  
Scope: Screen Layout accessible to Company Manager

**For RBLS - 03:**

- Permission: Change Layout  
Scope: Screen Layout accessible to Public Facility Manager

**Target Audience:**

- Super Admins
- Company Managers
- Public Facility Managers

**Pre-conditions:**

1. The authorized users must be logged into the platform
2. The authorized user must have the appropriate administrative permission to access this feature.
3. Access the “Layout Selection” from the settings panel.

**Success Outcome(s):**

- The preset layout preference will be accurately retrieved from the data store
- Authenticated users can only switch between layouts within their permission.
  - Super Admin can only switch between Super Admin (preset), Company Manager, Public Facility Manager, Employee, General User
  - Company Manager can only switch between Company Manager (preset), Public Facility Manager, Employee, General User
  - Employee can only switch between Employee (preset) and General User
- Authorized users will navigate to their settings.
  - Users locate the “Layout Selection” option.
- The current platform layout will be changed to the preferred layout within 3 seconds from the moment of submitting the account’s preference form
- The chosen layout preference will be accurately updated in the data store
- A log entry is created after a successful update to the data store with the following details:
  - Timestamp:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
  - Log Level: Info
  - User: [User's username]
  - Category: Data store
  - Description: “Successful change of layout”

### ***Failure Outcome(s):***

- A General User has access to the layout selector. This
- Users access layouts that are outside of their permissions
  - Company Manager can switch to a super admin layout
  - Employee can only switch to a company manger or super admin layout
  - A General user can switch to a Super Admin, Company Manager, Public Facility Manager or Employee
- Authenticated users cannot switch between layouts within their permission.
  - Super Admin cannot switch between Super Admin , Company Manager, Public Facility Manager, Employee, General User
  - Company Manager cannot switch between Company Manager , Public Facility Manager, Employee, General User
  - Employee cannot switch between Employee and General User
- Authorized user selects a layout, but does not change the view. The system will output the following message “layout is not able to change
- Authorized user selects a layout, but changes into the incorrect view. System will display “Incorrect display, please come back later”
- The Layout preference does not accurately update after submitting the layout preference form but the system flagged the layout preference change as success. This is a non-recoverable issue, the data is lost and it is out of the user’s control.
- The Layout preference does not accurately update after submitting the layout preference form the system flagged the modification as a failure. The system will output the following message “The layout preference was not saved, please try again later.”
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Error changing layout”
- The current platform layout doesn't change to the preferred layout within 3 seconds of the selection submission. Unrecoverable, the system would not know.
- The current platform layout changes to the preferred layout not within 3 seconds of the selection submission. Unrecoverable, the system would not know.



- Failed to change layout preference because the database is offline. The system will output the following message: “Database is not able to save changes right now, please come back later.”
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Error
    - User: [User's username]
    - Category: Data store
    - Description: “Data store is offline, cannot accept data”

## Schedule Downloader

### 1. SD - 01 (Effort Points: 100)

As a registered user, I want to be able to export my reservations, so that I can easily integrate and apply them to my personal or professional calendar. This aids in avoiding scheduling conflicts and ensures that I am adequately prepared for the reservations I have made.

#### Required Input(s)

- Request to download download schedule
  - Specify time range of schedule
    - Date Format: yyyy-MM-dd
    - i.e, 2023-11-17
    - Date must be after current date
  - Format
    - List
      - Downloadable as a txt file
    - Calendar
      - Downloadable as an ics file

#### Data Source

- Origin = External
- Type = Web API
- Details = A download prompt will be added to the platform and when selected, it generates an ics file that contains the date, time, location, links, and description of each reservation.
- AuthN = TBD

#### App Permissions

Permission: Download

Scope: Reservations

#### Target Audience

The target audience are for registered users that would want to download a copy of their upcoming reservation as a txt file or ics file in order to add to calendar

### **Pre-conditions**

1. User must be logged in
2. Must have a scheduled reservation
3. User must access the personal overview page

### **Success Outcome(s)**

- When exporting, the downloaded file type is the specified file type
- Downloaded files display accurate information
  - Time range of schedule
  - Format
- Ics file is accurately able to be added to personal calendar
- Reservations are accurately retrieved from the data store in order to be downloaded
- Data is converted into the type specified by the user
  - Type: Ics for calendars
  - Type: Txt for lists
- File is successfully downloaded
  - Ics
  - Txt
- Downloading data takes 3 seconds or less after downloading
  - Successful download of files are logged:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Successfully exported data and file has been downloaded."
- Database is online to be able to download data.

## **Failure Outcome(s)**

- Invalid user inputs. The system will display a “Invalid user input.” message.
  - Time range of schedule is incorrect format
  - A log entry is created with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: View
    - Log Description: “Invalid Inputs.”
- When exporting data for downloading, data does not download into the specified file type of the user (ics, txt). This is non-recoverable due to the system not being able to identify whether the file that was downloaded is the correct file type or not.
  - no download is initiated
  - wrong file type is downloaded
- Downloaded data is inaccurate. This is non-recoverable due to downloading of data from the database being out of the system’s control.
  - Downloaded file does not include the accurate upcoming reservation information for specified time frame
- Ics file is not able to be added to the calendar. The system will display a “Please try again later.” message
  - Error to schedule downloader is logged:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Debug
    - User: [User's username]
    - Log Category: Data Store
    - Log Description: “Failed to add ics file.”
- Retrieval of data from the data store does not process and the system marks the retrieval as a success. This is non-recoverable due to retrieval of data from the data store failing and not returning any output, but the system marks it as successful.
- Retrieval of data from the data store does not process and the system marks the retrieval as a failure. The system will display a “Failed to retrieve data. Please try again.” message.
- Downloading data takes more than 3 seconds to process. System will log default “Time Limit for Operation Exceeded”.

- Failed to download data because the database is offline. The system will output the following message: “Database is not able to process downloads right now, please come back later.”
  - Error to schedule downloader is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to retrieve data. Database is offline.”
- Failed to retrieve data because the database is offline. The system will output the following message: “Database is not able to retrieve data right now, please come back later.”
  - Error to schedule downloader is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to retrieve data. Database is offline.”

## Data Analytics

### 1. **DA - 01 (Effort points [Hours]: 300) (Complexity: Medium)**

As an authenticated admin user, I want to be able to access data analytics on reservations and spaces in order to interpret and analyze trends and statistics.

#### **Required Input(s):**

User input required to compute accurate and specific data analytics.

- Timeline
  - selecting specific data from one of the following:
    - Day: yyyy-MM-dd
    - Week: yyyy-MM-dd - yyyy-MM-dd
    - Month: yyyy-MM
    - i.e, 2023-11-17

#### **Optional Input(s):**

- Visualizations Selection:
  - Line Graph
  - Bar Graph
  - Table Chart

### **App Permissions**

Permission: View

Scope: analyze data and trends depicted in graphs and charts

### **Target Audience**

The target audience are towards any employees that requires data to be analyzed within the application

### **Pre-conditions:**

1. User must be logged in
2. Must have an admin role as Super Admin, Company Manager, or Public Facility Manager
3. At least a day's worth of data needed in order to display analytics

### **Success Outcome(s):**

- Data will be calculated and shown to user within 3 seconds of uploading user input
  - Successful data analysis logged:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: Authenticated Admin
    - Category: Data store
    - Description: "Made a successful data analysis."
- Data is accurately displayed
- User inputted information are accurate

### **Failure Outcome(s):**

- No inputted data is given. The system will display an "Input Data." message.
  - Required Inputs are needed for data to be shown. (Timeline)
    - One of the following inputs are needed:
      - Day: yyyy-MM-dd
      - Week: yyyy-MM-dd - yyyy-MM-dd
      - Month: yyyy-MM
      - i.e, 2023-11-17
  - Error to data analytics is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42

- Log Level: Error
  - User: [User's username]
  - Category: View
  - Description: "No input is given."
- Not enough data for trends to appear. The system will display a "More data is needed. Input more timelines." message.
  - Error to data analytics is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Category: View
    - Description: "Not enough information to display trends in data."
- Data is inaccurate. This is non-recoverable due to retrieval of data from the data store resulting in inaccurate information.
  - Timelines
- Data does not appear within 3 seconds after uploading the user input. System will log default "Time Limit for Operation Exceeded".
- User inputted invalid information. The system will display an "Invalid Input." message and highlight the input boxes that need a change in input.
  - Possible invalid inputs:
    - date(s): out of bound, data type
  - Error to data analytics is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Category: Data Store
    - Description: "Invalid information upon requesting data analytics"
- User inputted inaccurate information. This is non-recoverable due to the system allowing the user to input timelines themselves, causing inaccurate information to be out of the system's control.
  - Possible inaccurate inputs:
    - date(s): out of bound, data type
- Failed to store data updates because the database is offline. The system will output the following message: "Database is not able to store data right now, please come back later."

- Error to data analytics is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Error
  - User: [User's username]
  - Log Category: Data
  - Log Description: "Failed to store data. Database is offline."

## Expense Tracker

### 1. ET-1 (Effort Points [Hours] : 200) (Complexity: Low - Medium)

As a registered user, I want to be able to see how much spending is made on reservations visually after inputting my spending history.

#### **Required Input(s)**

Allowing registered users to input their spending history manually helps them visualize information in the output rather than having them calculate it in their head.

- Purchases:
  - Date: yyyy-MM-dd
  - i.e, 2023-11-17
  - Amount: USD (Ex: \$20.02)
  - Location: Reservation place within Irvine, California

#### **Optional Input(s)**

- Filters:
  - Daily
  - Weekly
  - Monthly
  - Yearly
  - Default
    - All time spending

#### **Required Output(s)**

Including different ways to visually see data helps registered users choose which information graph suits them

- Graphs:
  - Bar graphs
  - Line graphs

#### **App Permissions**

Permission: Able to input purchases to get a visual output

Scope: Expenses will be tracked only on what the user inputs through their own spending history

### **Target Audience**

Any users that want a spending history within the application

### **Pre-conditions**

- Users must be registered
- Have at least one reservation made in the past

### **Success Outcome(s)**

- Graphs are shown correctly with axis labeled and accurate graphs are shown (bar graph or line graph)
- Display is shown in 3 seconds or less when submitting the inputted information
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Log Category: Data Store
  - Log Description: "Expenses are displaying successfully."
- Daily expenses from reservations of each location is shown as will be the same, but will also have the option for weekly, monthly, and yearly expenses
- Default will show all time spending
- Visual information depending on type specified by the registered user gets processed into that type (bar graph or line graph)
- All inputted expenses on reservations are accurate from the specified filter (daily, weekly, monthly, yearly, default)
- Does not show any duplicate purchases within the data
- Inputs the valid type of information available (Date, Amount, Location)

### **Failure Outcome(s)**

- No display is shown with either charts and graphs. This is non-recoverable due to the system displaying output as a success and what exactly is being displayed is out of the system's control.
- Loading of many accounts of expenses can result in a slow and unresponsive application. This is non-recoverable due to the load of data from the data store being more than the application can handle.



- Options are not working as intended in which daily expenses can be labeled as weekly, monthly, and yearly. This is non-recoverable due to the system applying the filter options when applied resulting in a success, but the display is inaccurate causing the display to be out of the system's control.
- Information results in a visual not specified by the user. This is non-recoverable due to the system not being in control of what exactly is being displayed.
- Data is processing expenses that affect the output. This is non-recoverable due to the data store containing more than one copy of the same expense.
  - Duplicates of the same expenses
- Gathered information resulting in another registered user's expenses information. This is non-recoverable due to the system gathering data on the user from the data store.
- Invalid Input type for input values (Date, Amount, Location). Display in red under the input box an error message saying "Invalid Date", "Invalid Amount", or "Invalid Location" depending on which box the registered user is inputting the invalid information in.
  - Error to expense tracker is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Invalid Input."
- Expense Tracker view takes longer than 3 seconds to appear after submission. System will log default "Time Limit for Operation Exceeded".
- Failed to store data because the database is offline. The system will output the following message: "Database is not able to store data right now, please come back later."
  - Error to expense tracker is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Failed to store data. Database is offline."

## QR Code Reservations

### 1. **QRCR - 01 (Effort Points: 30) (Complexity: Medium)**

As a registered user, I want to be able to scan a QR code physically placed at a reservable space and be redirected to the login of the Space Surfer page

### 2. **QRCR - 02 (Effort Points: 30) (Complexity: Medium)**

As a registered user, I want to be able to log in to my authorized Space Surfer Account and be shown the Facility's available spaces upon signing in.

### **Required Input(s)**

User input is required to be able to access the QR code. This is crucial to allow the connection to the website while also giving exposure to our website.

- Unregistered User Must first create an account (see Registration)
- Registered User must input:
  1. Authorized username
  2. Corresponding password
- Continue with Space Reservation for Users

### **Data Source**

- Origin = External
- Type = Web API
- Details = QR code reader will direct to the link associated with that QRcode in that space. From that link, users can make a reservation.
- AuthN = TBD

### **App Permissions**

Permissions: View, Create

Scope: Direct link, QR Code

### **Target Audience**

Users that wish to make a reservation when they come across a spot or are near a spot that they are currently located at without having to manually find the space on the website

### **Pre-conditions**

- Must have access to a phone camera
- Must authorize permission to open Space Surfer web app from the QR code
- User must have a registered account

### **Success Outcome(s)**

- Space Surfer Website accessible through QR code
- Space surfer Website loads within 3 seconds or less of scanning QR code
- Correct website is loaded after scanning the QR code

- Scanning QR code takes user to login page
  - A log entry is created for every scan of the QR code with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Log Category: Server
    - Log Description: "Scan of QR code."
- Detailed information is shown next to QR code

### ***Failure Outcome(s)***

- Space Surfer Website loads after 3 seconds of scanning QR code. System will log default "Time Limit for Operation Exceeded".
- Space Surfer Website does not load after scanning QR code. This is non-recoverable due to the system not knowing whether or not the user reached the site after scanning the QR code.
- After scanning the QR code, a different website was loaded. This is non-recoverable due to the embed of the pattern of the QR code being outside of what the system is responsible for.
- Scanning the QR code takes the user to a page other than the login page on Space Surfer site. This is non-recoverable due to the QR code embed defaulting to the login page. The system is unable to track whether or not the user was sent to the login page after scanning the QR code.
- Information shown next to the QR code is inaccurate. This is non-recoverable due to the system not being able to check the information posted next to the QR code.
- Information shown next to the QR code is missing. This is non-recoverable due to the system not being able to check the information posted next to the QR code.
- Failed to retrieve data because the database is offline. The system will output the following message: "Database is not able to retrieve data right now, please come back later."
  - Error to QR code reservation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42

- Log Level: Error
- User: [User's username]
- Log Category: Data
- Log Description: "Failed to retrieve data. Database is offline."

## Task Manager Hub

### 1. TMH - 01 (Effort Points[Hours]: 30) (High Complexity)

As an authenticated user, I want to have a to-do list, so I can keep track of tasks and stay organized.

#### **Required Input(s) for TMH - 01:**

- Task Title
- Task Description
- Due Date
  - start and end dates
    - Valid Format: yyyy-MM-dd
    - i.e, 2023-11-17

#### **App Permissions:**

Permission: Create

Scope: To-Do List

#### **Target Audience:**

Authenticated users who need task management capabilities.

#### **Pre-conditions:**

1. Unauthenticated users must be authenticated into their accounts.
2. Authenticated Users should have tasks, projects, or duties to manage.

#### **Success Outcome(s):**

- Users can successfully create a new task with a title, description, due date, and priority.
  - A log entry is created for every creation of a task with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Log Category: View
    - Log Description: "Task was created."
- Users can edit existing tasks, updating their title, description, or due date.

- A log entry is created for every edit of a task with the following details:
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Info
  - User: [User's username]
  - Log Category: View
  - Log Description: "Edits were done to a task."
- Users can delete tasks from their to-do list.
  - A log entry is created for every deletion of a task with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Log Category: View
    - Log Description: "A task was deleted."
- The to-do list displays tasks in a clear and organized manner, making it easy for users to manage their tasks.
- Real-time updates ensure that any changes to tasks, such as due date modifications or completed tasks, are reflected within 3 seconds.
- Users can effortlessly manage their to-do list, improving their task organization and productivity.

#### **Failure Outcome(s):**

- Authenticated users encounter an error when attempting to create a new task. This is non-recoverable due to the system being unable to store the data to the data store.
- Authenticated users successfully create a new task, but the task isn't added to the to-do list and the system marks the outcome as successful. This is non-recoverable due to the system being unable to store the data to the data store.
- Authenticated users successfully create a new task, but the task isn't added to the to-do list and the system marks the outcome as failed. The system will display a "Failed to create new task. Please try again." message.
- Authenticated users make an editing error when attempting to update an existing task. The system will display a "Editing Error. Make Edits." message.
  - Error to task manager hub is logged
    - Timestamp of error:

➤ Date Time format : yyyy-MM-dd HH:mm (UTC)

➤ i.e, 2023-11-17 10:42

- Log Level: Error
- User: [User's username]
- Log Category: Data Store
- Log Description: "Failed to save to the data store."

- Authenticated users make edits to a task, but these changes are not reflected in the task, but the system marks the outcome as successful. This is non-recoverable due to the system being unable to successfully save the edits made to the data store.
- Authenticated users make edits to a task, but these changes are not reflected in the task, but the system marks the outcome as failed. The system will display a "Failed to make edits. Please try again." message.
- Authenticated user deletes the task, but the task still appears and the system marks the outcome as successful. This is non-recoverable due to the data store not updating the deleted task.
- Authenticated user deletes the task, but the task still appears and the system marks the outcome as failed. The system will display a "Failed to delete task. Please try again." message.
- The to-do list fails to display tasks properly for the authenticated user. This is non-recoverable due to the system not being able to detect whether the outputted display is accurate or not.
- Updates to the tasks are not within 3 seconds of submitting an update. System will log default "Time Limit for Operation Exceeded".
- Failed to store data because the database is offline. The system will output the following message: "Database is not able to store data right now, please come back later."
  - Error to task manager hub is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Failed to store data. Database is offline."
- Failed to retrieve data because the database is offline. The system will output the following message: "Database is not able to retrieve data right now, please come back later."

- Error to task manager hub is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Error
  - User: [User's username]
  - Log Category: Data
  - Log Description: "Failed to retrieve data. Database is offline."

## **2. TMH - 02 (Effort Points[Hours]: 30) (High Complexity)**

As an authenticated user, I want to prioritize my tasks within the to-do list to ensure I focus on the most important ones first.

### **Required User Inputs for TMH -02:**

- Priority Level
  - Low
  - Medium
  - High

### **App Permissions:**

Permission: Prioritize

Scope: To-Do List

### **Target Audience:**

Users who want to manage their tasks based on priority.

### **Pre-conditions:**

1. Unauthenticated users must be authenticated into their account.
2. Authenticated user has tasks in the to-do list.

### **Success Outcome(s):**

- Users can assign priority levels to tasks within their to-do list to one of the following:
  - low
  - medium
  - high
  - A log entry is created for every priority change of a task with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info

- User: [User's username]
  - Log Category: View
  - Log Description: Priority changes were done in the task manager hub
- Tasks are sorted based on their priority level, with high-priority tasks displayed at the top.
- Tasks are then sorted based on their due date, with closest due date tasks displayed at the top.
- The prioritization feature successfully integrates with the to-do list, streamlining the authenticated user's task management experience.

***Failure Outcome(s):***

- Authenticated users attempt to assign priority levels to tasks, but the system doesn't recognize the provided priority levels. This is non-recoverable due to the area being out of system control.
- Sorts tasks by priority levels, but tasks with the same priority level have conflicting due dates. This is non-recoverable due to the area being out of system control.
- Tasks have conflicting due dates, and the system fails to sort them correctly. This is non-recoverable due to the area being out of system control.
- Integration failures with the to-do list, causing unpredictable behavior in task management. This is non-recoverable due to the area being out of system control.
- Authenticated users experience data loss where tasks or their priority assignments disappear unexpectedly. This is non-recoverable due to the area being out of system control.
- Authenticated users make changes to task priorities, but the changes are not saved and the system marks the outcome as successful. This is non-recoverable due to the system marking the outcome as successful but the data store was not updated.
- Authenticated users make changes to task priorities, but the changes are not saved and the system marks the outcome as failed. The system will display a "Failed to change task priorities. Please try again." message.
- Updates to the tasks are not within 3 seconds of submitting an update. System will log default "Time Limit for Operation Exceeded".
- Failed to store data because the database is offline. The system will output the following message: "Database is not able to store data right now, please come back later."



- Error to task manager hub is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Error
  - User: [User's username]
  - Log Category: Data
  - Log Description: "Failed to store data. Database is offline."
- Failed to retrieve data because the database is offline. The system will output the following message: "Database is not able to retrieve data right now, please come back later."
  - Error to task manager hub is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Failed to retrieve data. Database is offline."

### 3. **TMH - 03 (Effort Points[Hours]: 20) (Medium Complexity)**

As an authenticated user, I want to receive notifications for task-related events, such as approaching due dates or task assignments hours before.

#### **Required User Inputs:**

- Notification Settings
  - On (Preset)
    - Notification Time Settings
      - 1 Hour
      - 6 Hours
      - 12 hours
      - 24 hours(preset)
      - 48 Hours
  - Off

#### **App Permissions:**

Permission: Notify

Scope: Task Events

#### **Target Audience:**

Authenticated users who want to stay informed about their tasks.

**Pre-conditions:**

1. Unauthenticated users must be authenticated users in their account.
2. Authenticated users must have tasks in the to-do list.

**Success Outcome(s):**

- Authenticated users encounter errors while trying to access their notification settings.
- Authenticated users encounter errors while trying to configure their notification settings.
- Preferences are configured according to authenticated users preferences
- The notification system does not send notifications if the option “Off” was preferred.
- The notification system sends a notification based on the hours preferred.
- The notification system sends a notification based on the presets, if nothing was configured.
  - A log entry is created for every notification setting change with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Log Category: View
    - Log Description: Notification settings was changed
- Authenticated users receive the notification within 3 seconds of the preferred time, if applicable.
  - A log entry is created for every notification delivery with the following details:
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Log Category: View
    - Log Description: Notification was sent.

### **Failure Outcome(s):**

- Authenticated users can access notification settings. This is non-recoverable due to the area being out of system control.
- Authenticated users face issues when configuring their notification preferences. This is non-recoverable due to the area being out of system control.
  - Cannot change time settings
- Authenticated users haven't configured their preferences, and the notification system does not send based on presets. This is non-recoverable due to the area being out of system control.
- Authenticated users have configured their preferences, and the notification system does not send based on presets. This is non-recoverable due to the area being out of system control.
- Authenticated users who have set their notification preference to "Off" continue to receive notifications. This is non-recoverable due to the area being out of system control.
- Authenticated users receive inaccurate notifications. This is non-recoverable due to the area being out of system control.
- Authenticated users receive duplicate notifications for the same event. This is non-recoverable due to the area being out of system control.
- Authenticated users receive notifications at times that do not match their configured time zone or preferred timing. This is non-recoverable due to the area being out of system control.
- Authenticated users do not receive the notification within 3 seconds of the preferred time, if applicable.
  - Timeout length of 3 seconds - 5 seconds
  - System will display the following message: "Notification has taken longer than expected. Please check to see that notification has been sent successfully, if not request a new notification to be sent."
  - Error to task manager hub is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Warning
    - User: [User's username]
    - Category: Business
    - Description: "Operation took more than 3 seconds."

- Timeout length of more than 5 seconds
- System will display the following message “System timeout error”
- Error to task manager hub is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Error
  - User: [User's username]
  - Category: Business
  - Description: “Operation took more than 5 seconds”
- Failed to store data because the database is offline. The system will output the following message: “Database is not able to store data right now, please come back later.”
  - Error to task manager hub is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to store data. Database is offline.”
- Failed to retrieve data because the database is offline. The system will output the following message: “Database is not able to retrieve data right now, please come back later.”
  - Error to task manager hub is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to retrieve data. Database is offline.”

## Waitlist

### 1. **WL - 01 (Effort points [Hours]: 100) (Complexity: High)**

As an authorized user, I want to be able to add myself to a waitlist for a space that has already been reserved at a time I also want to reserve that spot for as well as be able to remove myself from a waitlist.

### 2. **WL - 02 (Effort points [Hours]: 60) (Complexity: High)**

As an authorized user who has joined a waitlist and have been moved to the first spot, I want to be notified that I became first in line for the reservation and have my reservation be automatically submitted.

## **App Permissions**

Permission: Join and leave

Scope: Waitlist

## **Target Audience**

All registered users who wish join a queue for a spot that has already been reserved for that time and date by another user

## **Pre-conditions**

1. Users must be in an active session
2. Space that user wants to join the waitlist for must already be reserved by another user for that time/date in order for the waitlist feature to be available

## **Success Outcome(s)**

- Within 3 seconds of joining the waitlist, the user will be shown the list of the current waitlist for that space at the time/date
  - Waitlist creation is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - Log Level: Info
    - User: [User's username]
    - Category: Data store
    - Description: "Waitlist has been created."
- After joining a waitlist, the waitlist for that space can be viewed from the user's reservation history view
- For WL 02: Users will be emailed a notice letting them know they have been moved to the first spot and that their reservation has been automatically been submitted
  - Email will contain contents in this format:
    - Message letting them know they have been moved to the first spot and the reservation has been automatically submitted
    - Link to the reservation in order to view its details or to cancel the reservation
  - Opening the link will redirect them to the reservation's page within 3 seconds

- User's spot in the waitlist is recorded in the data store
  - Changes in the waitlist are logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Category: Data store
    - Description: "Changes have been made in the waitlist."
- Waitlists are removed from the database after the time and date for that reservation has passed and that reservation has been fulfilled
  - Waitlist removal is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Info
    - User: [User's username]
    - Category: Data store
    - Description: "Waitlist has been removed."
- Waitlist takes 3 seconds or less to update

### ***Failure Outcome(s)***

- Waitlist option appears even if that reservation is still available to the user. The system "Come back later" message will display if the option still appears.
  - Error to waitlist is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Debug
    - User: [User's username]
    - Log Category: View
    - Log Description: "Showing waitlist when reservation is not full."
- User is not shown in the waitlist after joining, but the system marks the outcome as successful. This is non-recoverable due to the system marking the message display as successful, but no display of data is shown.
- User is not shown in the waitlist after joining, but the system marks the outcome as failed. The system will display a "Come back later" message if the user is not shown after joining the waitlist.

- Error to waitlist is logged
  - Timestamp of error:
    - Date Time format : yyyy-MM-dd HH:mm (UTC)
    - i.e, 2023-11-17 10:42
  - Log Level: Debug
  - User: [User's username]
  - Log Category: View
  - Log Description: "User is not updated into the waitlist."
- Waitlist is not displayed accurately in the user's reservation history view. This is non-recoverable due to the system not being able to detect if the display is accurate or not.
- Removal from a waitlist is not updated in the reservation history view, but the system marks the outcome as successful. This is non-recoverable due to the system marking that the removal was updated, but was not updated resulting in loss of data.
- Removal from a waitlist is not updated in the reservation history view, but the system marks the outcome as failed. The system will display a "Failed to remove from waitlist. Please try again." message.
- Waitlist takes longer than 3 seconds to update. System will log default "Time Limit for Operation Exceeded".
- For WL 02: User is not emailed a notice letting them know they have been moved to the first spot and that their reservation has been automatically submitted. This is non-recoverable because system is unable to access the user's email
  - Email is inaccurate
  - The link does not redirect them to the reservation's page within 3 seconds
  - The email is sent to the inaccurate recipient
- User's spot in the waitlist is not updated or added to the data store. This is non recoverable due to the system processing updates in which the data store does not process, resulting in loss of data.
- Waitlists are not removed from the data store after the time and date for that reservation has passed and that reservation has been fulfilled and the system marks the outcome as successful. This is non-recoverable due to the system stating that the removal was successful, but the data was not removed in which it is out of the system's control.
- Waitlists are not removed from the data store after the time and date for that reservation has passed and that reservation has been fulfilled and the system marks the outcome as failed. The system will update the waitlist again and if not removed, go through the removal process again.

- Opening the link will not redirect them to the reservation's page within 3 seconds. System will log default "Time Limit for Operation Exceeded".
- Failed to store data because the database is offline. The system will output the following message: "Database is not able to store data right now, please come back later."
  - Error to waitlist is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Failed to store data. Database is offline."
- Failed to retrieve data because the database is offline. The system will output the following message: "Database is not able to retrieve data right now, please come back later."
  - Error to waitlist is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: "Failed to retrieve data. Database is offline."

## Service Provider Integration

### 1. SPI - 01 (Effort Points [Hours]: 125) (Complexity: High)

As an authorized user with a scheduled reservation, I want to be able to hire services to do some sort of work that I won't be able to do while at my reserved spot to help me be more productive.

### 2. SPI - 02 (Effort Points [Hours]: 125) (Complexity: High)

As a company manager, I want to be able to provide services to the users that make reservations to boost productivity.

## Required Input(s)

User input is required to be able to hire services. This is crucial as our company serves as the middleman between the users and the service provider

- First name
  - Min: 1 character
  - Max: 50 characters



- No special symbol characters
- No numerical numbers
- Last name
  - Min: 1 character
  - Max: 50 characters
  - No special symbol characters
  - No numerical numbers

***App Permissions:***

Permission: Add

Scope: Service

***Target Audience:***

Users that wish to hire services to increase their productivity levels while reserving a space.

***Pre-conditions:***

1. User must have a scheduled reservation
2. Must be able to contact services through a communication device

***Success Outcome(s) - SPI - 01***

- An option will appear on each reservation to allow users to hire a service
- Clicking the option displays a list of services available along with information regarding that service within 3 seconds
- Reservation information, such as time and space, is retrieved from the data store and shown on the service provider view so that users can see the reservations they have made
- List of services available at the time of a reservation is retrieved from the database to be shown on the list when users choose to hire a service
- NOTE: Service reservations will be made and transacted between the user and the service provider. SpaceSurfer will only provide a list of available services during the time of a user's reservation and provide information regarding that service.

***Failure Outcome(s) - SPI - 01***

- An option for services does not appear on each reservation to allow users to hire a service, but the system marks the outcome as successful. This is non-recoverable due to the system marking that hiring services are enabled in the reservation spot, but was not being displayed accurately.

- An option for services does not appear on each reservation to allow users to hire a service, but the system marks the outcome as failed. The system will display a “Come back later.” message.
- Option does not display a list of services available along with information regarding that service within 3 seconds. System will log default “Time Limit for Operation Exceeded”.
- Option for services does not display a list of services available along with information regarding that service at all. This is non-recoverable due to the information on services being provided by the provider.
- Options for services displayed are inaccurate. This is non-recoverable due to the system not being able to tell whether or not the information is inaccurate or not
- Options for services displayed are blank. This is non-recoverable due to the system not being able to tell if the information is blank or not.
- Failed to retrieve data because the database is offline. The system will output the following message: “Database is not able to retrieve data right now, please come back later.”
  - Error to service provider integration is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to retrieve data. Database is offline.”

### ***Success Outcome(s) - SPI - 02***

- Managers will have the option to add services
  - Managers can submit information regarding the service (name, rate, address, email, phone number, etc.)
  - Submitting services closes the pop-up within 3 seconds and returns the user back to the service provider page
  - The newly added service will appear on the list (alphabetical order by service name)
- Managers will have the option to remove services from that list
  - Removing adds a check/indication box next to each service on that page within 3 seconds

- After checking zero or more boxes on that list and submitting, the user will stay on the same page with no more boxes visible and the changes will be reflected within 3 seconds
- Cancelling will remove the boxes and the user will stay on the same page
- List of services available at the time of a reservation is pulled from the database to be shown on the list pop-up when users choose to hire a service

### ***Failure Outcome(s) - SPI - 02***

- The list of services is empty when it's not supposed to be. This is non-recoverable due to the system not being able to detect if the information being displayed is empty or not.
- The list of services is inaccurate when it's not supposed to be. This is non-recoverable due to the system not being able to detect if the information being displayed is inaccurate or not.
- Managers don't have the option to add services to that list, but the system marks that the managers do have the option as successful. This is non-recoverable due to the system detecting that the option for managers to be able to add services is online, but managers are unable to view the option resulting in loss of data.
- Managers don't have the option to add services to that list, but the system marks that the managers do have the option as failed. The system will display a "Come back later" message.
- Managers don't have the option to remove services from the list, but the system marks that the managers do have the option as successful. This is non-recoverable due to the system detecting that the option for managers to be able to remove services is online, but managers are unable to view the option resulting in loss of data.
- Managers don't have the option to remove services to the list, but the system marks that the managers do have the option as failed. The system will display a "Come back later" message.
- List of services available at the time of a reservation is inaccurate. This is non-recoverable due to the information being updated in the database which is out of the area the system is responsible for.
  - Data from different tables or inaccurate columns are shown on the page instead

- Removing services from the list takes more than 3 seconds. System will log default “Time Limit for Operation Exceeded”.
- Adding services from the list takes more than 3 seconds. System will log default “Time Limit for Operation Exceeded”.
- Failed to store data because the database is offline. The system will output the following message: “Database is not able to store data right now, please come back later.”
  - Error to waitlist is logged
    - Timestamp of error:
      - Date Time format : yyyy-MM-dd HH:mm (UTC)
      - i.e, 2023-11-17 10:42
    - Log Level: Error
    - User: [User's username]
    - Log Category: Data
    - Log Description: “Failed to store data. Database is offline.”