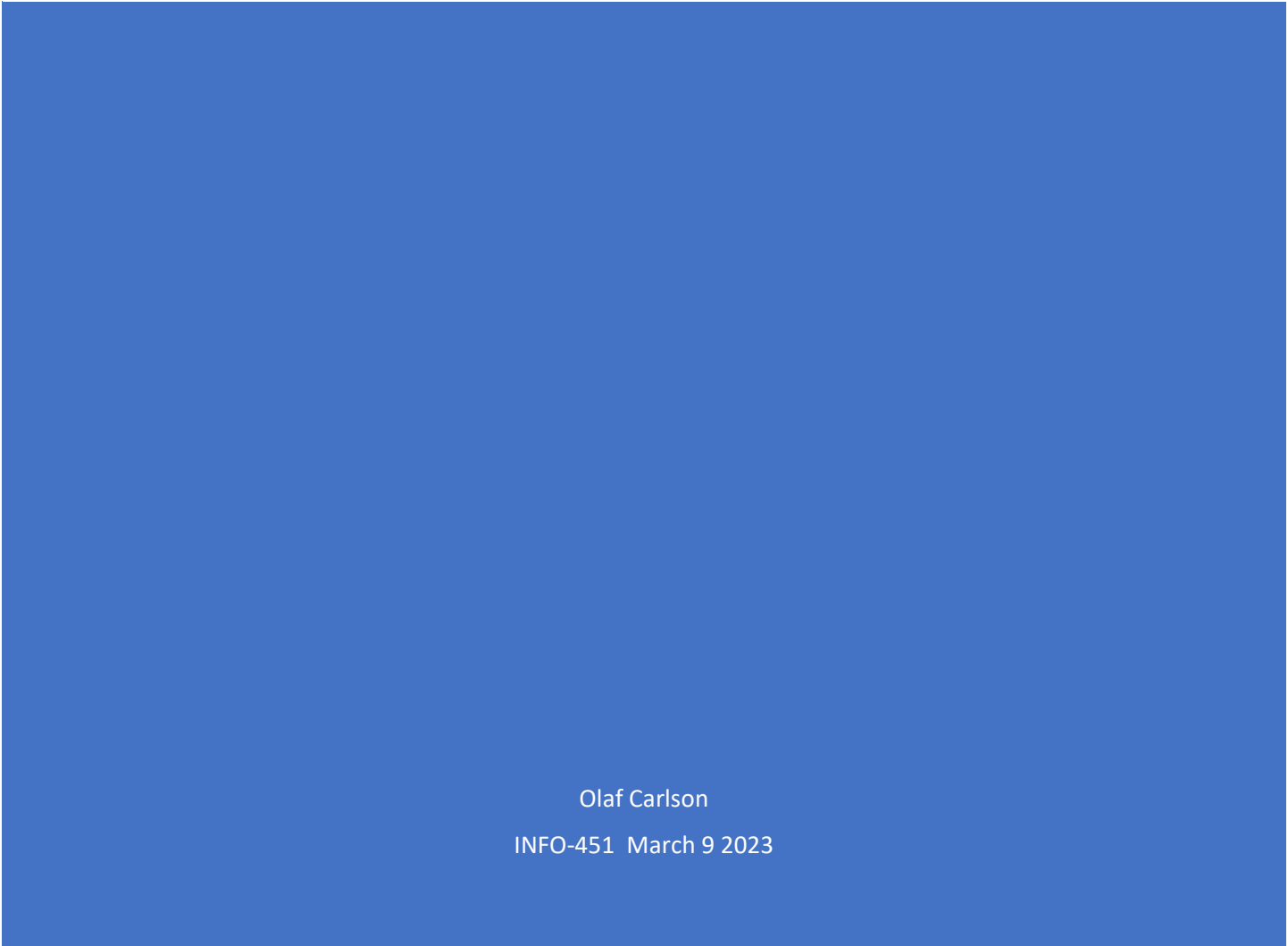# INVENTORY MANAGEMENT SYSTEM

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Customer Problem Statement

Technicians are arriving at sites to perform maintenance on equipment with an inventory system that is not accurate. This extends restoration of customers service by hours or days when spare inventory equipment is not available onsite for the repair. The feedback from technicians in the field is that the current inventory system is cumbersome to use and takes up an incredible amount of employee hours to validate inventory at each site yearly and keep it maintained.

The system application developed needs to be user friendly, reducing labor hours to inventory each building location yearly and keep inventory updated throughout the year. Login will require employees to enter their employee username and employee password to log into application as a security feature. Once logged into the application technician will be able to add, delete, and change status equipment by building location number. The equipment status options in inventory will include in-service, lost, pending return, spare, broken, and staging. The ability to search equipment by building location with queried options, HECI, Status, and Bay Location enables technician to validate equipment quickly by clicking a box. The equipment database includes the HECI, Status, Quantity, Cost, Description, Bay Location and Building Location number for each piece of equipment.

In summarizing everything that has been stated so far, technicians need an application that allows them to quickly pull up equipment by building location number with additional queries to validate the equipment as in-service, lost, pending return, spare, broken, installed, or staging. The application will allow technicians to reduce the amount of time validating equipment and maintaining inventory in building locations to free up more time meeting the needs of customers.

Glossary of Terms

- **HECI** – A set of letters and numbers associated with a piece of equipment by the manufacturer. Located on the front of the equipment.
- **Status** – in-service, lost, pending return, spare, broken, or staging. Equipment that is installed and working is **in-service**. Equipment that is not in building but is in inventory will be **lost**. Equipment to be returned to warehouse will be **pending return**. The equipment available will be **spare**. Equipment that are defective or not working will be **broken** status. Equipment that is part of future installation project at location have a status of **staging**.
- **Quantity** – count of specific HECI equipment in building location.
- **Building Location-** A two letter number followed by four digits specific to building location. State abbreviation such as IN for Indiana followed by a four-digit number.
- **Bay location** – Is an eight-digit number in which first two are the floor location followed by second four numbers as frame identification followed by two-digit number as bay location. Example 020004.03 is located of second floor, aisle 4 frame identification and bay 3.
- **Cost** – equipment in dollars.
- **Description-** Short description of pack less than forty characters.
- **Username** – Technicians' internal company username
- **Password** – Provided password giving technician access to inventory system.

System Requirements

Functional Requirements

No.	Priority Weight	Description
REQ-1: Search Inventory	High	Allow technicians to search by building location number.
REQ-2: Validate equipment	High	Allow technicians to mark equipment as validated.
REQ-3: Change Status	High	Allow technicians to change status of equipment.
REQ-4: Shipping Document	Low	Allow technician to create shipping documents.
REQ-5: Log In	High	Allow technicians to enter AT&T username and AT&T password to log into application.
REQ-6: Add Equipment	High	Allow technician to add equipment to building location.
REQ-7: Print out Inventory	Medium	Allow technicians to print out inventory by building location.

Nonfunctional Requirements

1. Functionality – application will be able to handle the volume and requirements of the system.
2. Usability – the application will be user friendly.
3. Reliability – the application will meet performance requirements throughout the day.
4. Performance – the application will maintain a rapid response time and be scalable.
5. Supportability – support will be accessible from six am to six pm Monday through Friday with updates being done on Sundays between ten pm to three am when the application has the least amount of traffic.

User Interface Requirements:

Application will run on a Windows operating system. To start the application user will click on a desktop icon to open login screen. Users will put in their login name and corporate password. After Login the users will have menu buttons at the top of the screen to navigate the application. Below are sketches of all screens along with a description of the screens that will be included along with locations of buttons, text boxes and menus.

1. **Login Screen** – A logo will appear at top of text box login UserName and Password. The user will type in their login name for username and then enter password.

2. Inventory Page – The inventory page appears when the user logins to application. Users can input the building location number with queried options HECI, Status, and Bay Location. The building location number is a requirement to perform search and additional queries can be included to narrow down the equipment. Search inventory button along with cancel button appear at the bottom of screen. Clicking the search button will send the user to inventory list page. If inputs are not valid or no building location is inputted, the application will notify the user. Exit button will exit out of application.

3. Inventory List Page – The inventory list page displays the list of inventoried packs searched from the inventory page. BuildingLocation, HECI, Description, Cost, Bay Location, Status, and Cost of the equipment for each inventoried equipment at building location is listed. Drop down menu will allow change of status to in-service, lost, pending return, spare, broken, or staging. Drop down menu will be provided for Quantity to change HECI equipment count. Bottom of the page displays a submit button to change inventory or cancel button to cancel changes returning to Inventory page. The Add-Equipment button at bottom directs the user to Add-Equipment page. Remove button at bottom will direct user to Remove-Equipment page. Button at top of page will direct user to Display Inventory page. Exit button at top of page will exit application.

4. Display Inventory Page – displays all the inventory in a building location. Users can print the page via the browser. User will exit by closing browser.

5.

Add Equipment Page – user is directed when Add-Equipment Button is pressed on Inventory List Page. Users input Building Location, HECI, Quantity and Status to submit new equipment. If invalid or not entered the user will be notified. Cancel will return user to View Inventory List Page. Exit button on top of page will exit the application.

6. **Remove Equipment Page-** users are directed to once Remove-Equipment Button is pressed on Inventory List Page. User must input Building Location, HECI, Quantity and Status to remove equipment.   If is invalid or not entered users will be notified. Cancel will return user to View Inventory List Page. Exit button on top of page will exit the application.

Functional Requirement Specification

Stakeholders: Below is a list of Stakeholders that would be interested in this application.

- Technicians / Managers

Actors and Goals: Below is a list which will demonstrate the roles if people that will interact with the system. All users have the same view and application ability.

Primary Actors:

-Technicians and Managers: Technicians and Managers can Log into the system, Logout of the system, View inventory for a specific site, Validate inventory, Search inventory, Print inventory for a specific site, Add inventory equipment and Delete Inventory.

Secondary Actors:

System: Responsible for giving details of inventory equipment and making changes to that equipment based on user selection. Database is part of the system.

Use Cases:

Estimate how long needed to implement use case:

Technician (total: 21)

> -Add Log into: To add login to system(2)
>
> **-Add Logout: To add logout of system (1)**
>
> **-Add View Inventory: To display inventory for specific site (3)**
>
> **-Add Validate inventory: To be able to Check off packs verified, make changes to status (5)**
>
> **-Add Search inventory: To display prompt search criteria to search database (2)**
>
> **-Add Print Inventory: To display inventory to be printed in printer format for a specific site (2)**
>
> **-Add Inventory: To be able to add equipment to database (3)**
>
> -Add Delete: To be able to delete inventory equipment in database (3)

System (total 23)

- Add backend: Develop MySQL database (7)
- Add front end: Develop GUI (10)
- Merge front end and back: Develop integration with MySQL database, GUI and Java application code (6)

Use Case:

Inventory Management System UseCase
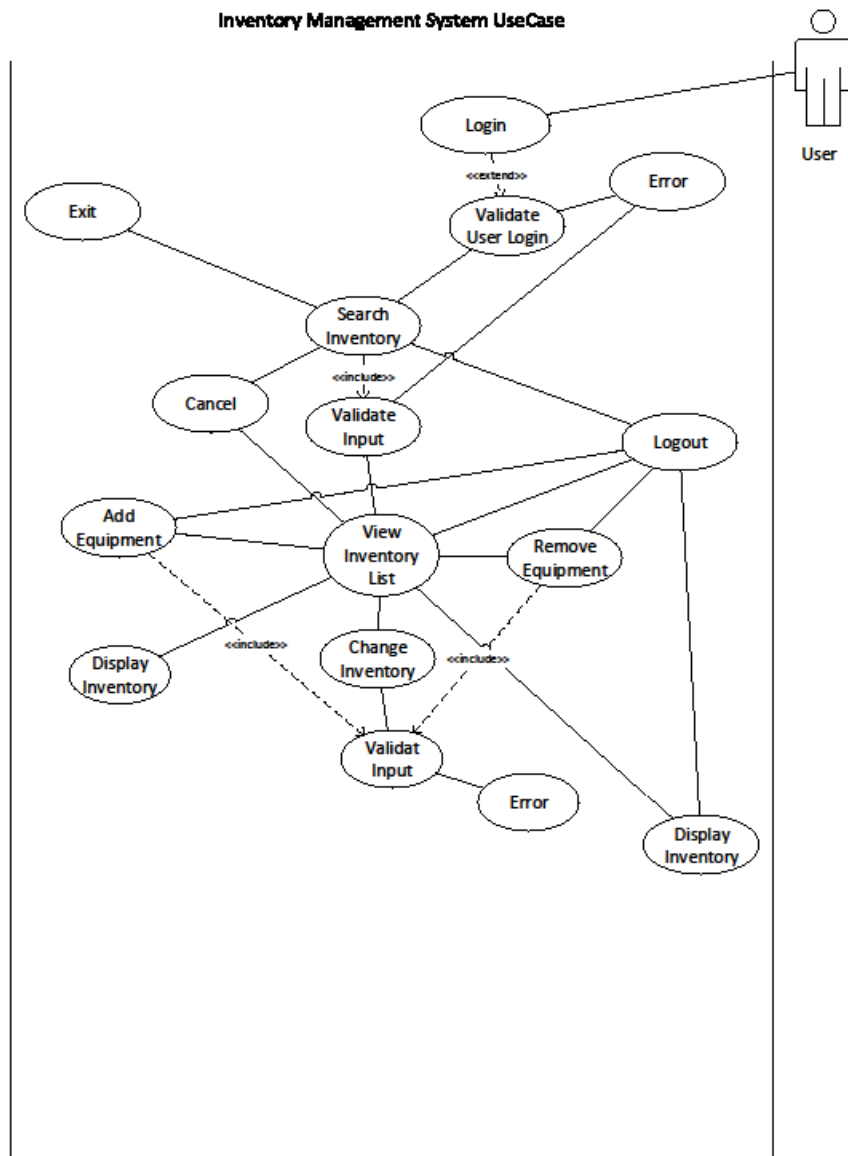
Class Diagram

Inventory
We have six inventory fields: heci, description, cost, bayLocation, status, and quantity. Inventory Class will be associated with MySQL database.
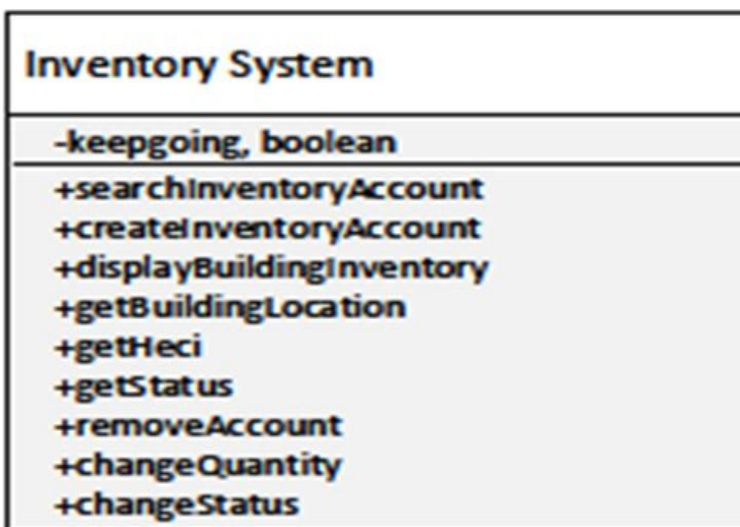
Inventory
-heci, String
-description, String
-cost, Double
-bayLocation, Double
-status, String
-quantity, int
+setHeci
+getHeci
+setDescription
+getDescription
+setCost
+getCost
+setBayLocaiton
+getBayLocaiton
+setStatus
+getStatus
+setQuanity
+getQuanity
+setBuildingLocation
+getBuildingLocation
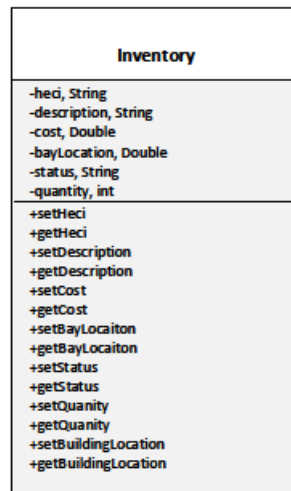
Building Location

This is an attribute for the class building location. It will be associated with a secondary mySQL database.

BuildingLocation
-buildingLocation, String
+getBuildingLocation +setBuildingLocation
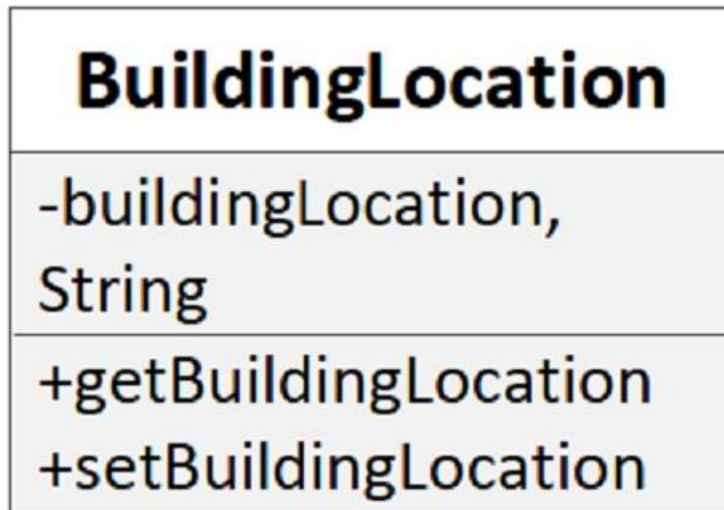
Inventory System

The Class allows user to input queries required Building Location with Heci or Status to search inventory or create inventory. User will be able to display building inventory by inputting some queries with the class. User will be able to remove account, change quantity and change status. This class will manipulate the mySQL databases using BuildingLocation and Inventory databases.

Inventory System
-keepgoing, boolean
+searchInventoryAccount +createInventoryAccount +displayBuildingInventory +getBuildingLocation +getHeci +getStatus +removeAccount +changeQuantity +changeStatus

User Class allows the user to login to the application utilize a mySQL database for username and passwords.
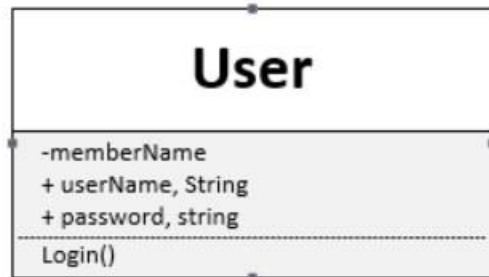
Class diagram of Inventory Management System:
We can summarize the class diagram of the system as follows:
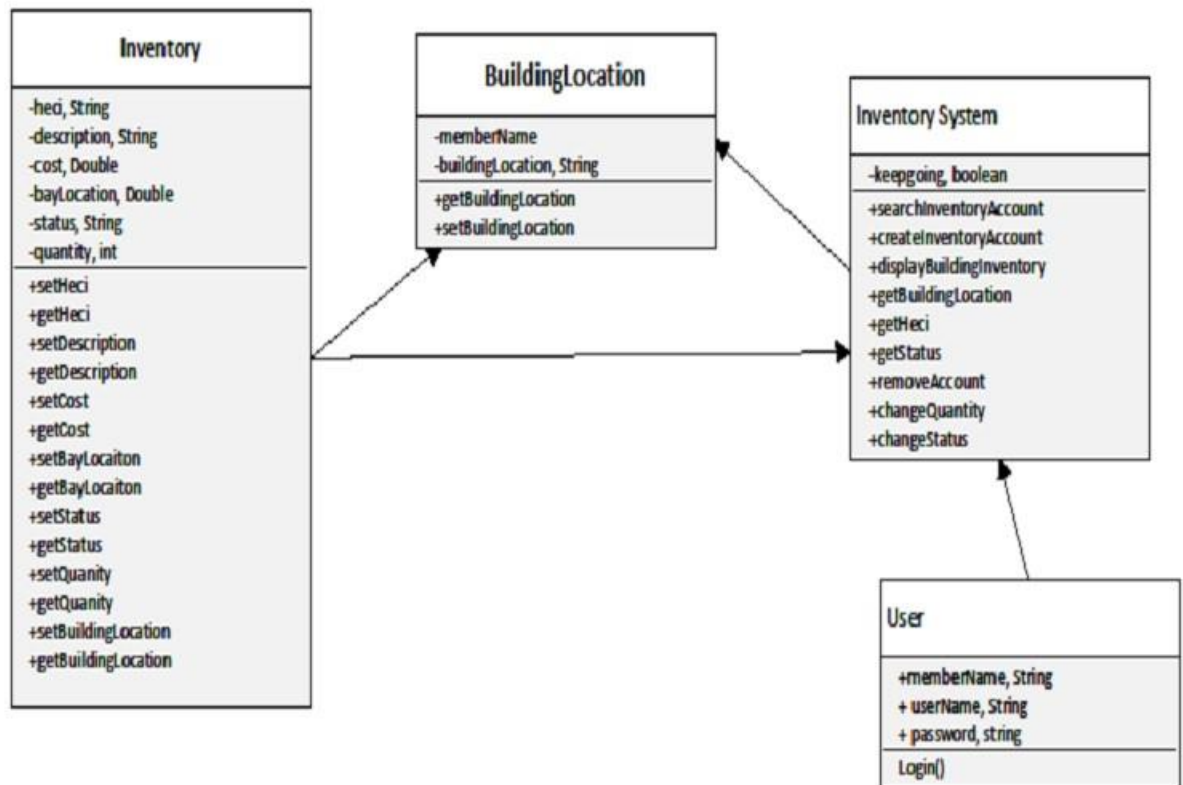
System Sequence Diagrams

Steps of Add Equipment

1. User inputs Building Location, HECI, Quantity, Status into form.
2. User clicks on submit.
3. User creates add equipment.
4. Add equipment data source validates if input valid.
5. Data Source creates equipment record.
6. Equipment is created.
7. Updates equipment record
8. Equipment is updated.
9. Equipment adds complete.

Add Equipment
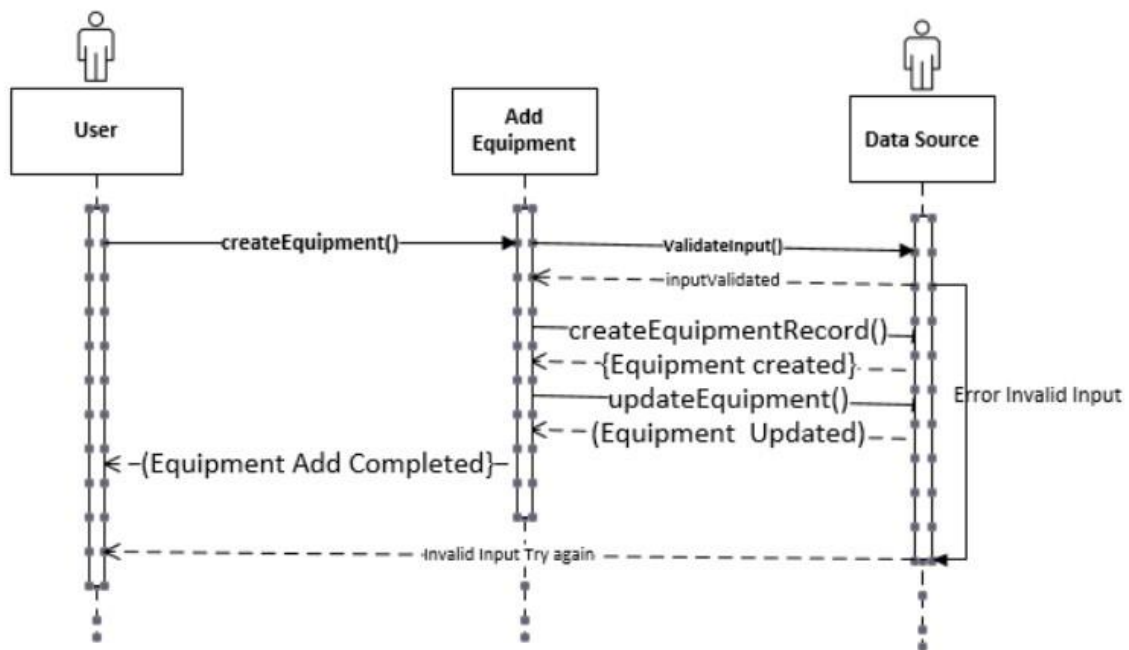
Steps of Change Inventory

1. User selects drop down boxes under Inventory List page to change status, and/or quantity.
2. User hits submit.
3. User creates change inventory.
4. Change equipment data source validation if input valid
5. Edit inventory record is sent to data source.
6. Edit inventory record is created.
7. Update equipment record.
8. Change inventory is updated.
9. Equipment change is complete.

Change Inventory
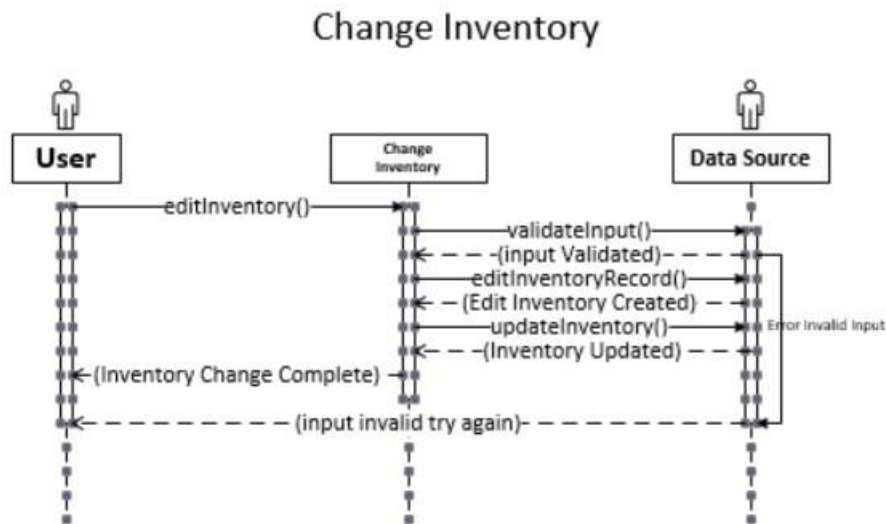
Steps of Remove Equipment

1. User inputs Building Location, HECI, Quantity, Status into form.
2. User clicks submit.
3. User creates remove equipment.
4. Remove Equipment data source validates if input valid.
5. Data Source creates remove record.
6. Remove record created.
7. Update equipment record.
8. Equipment is updated.
9. Equipment removes complete.
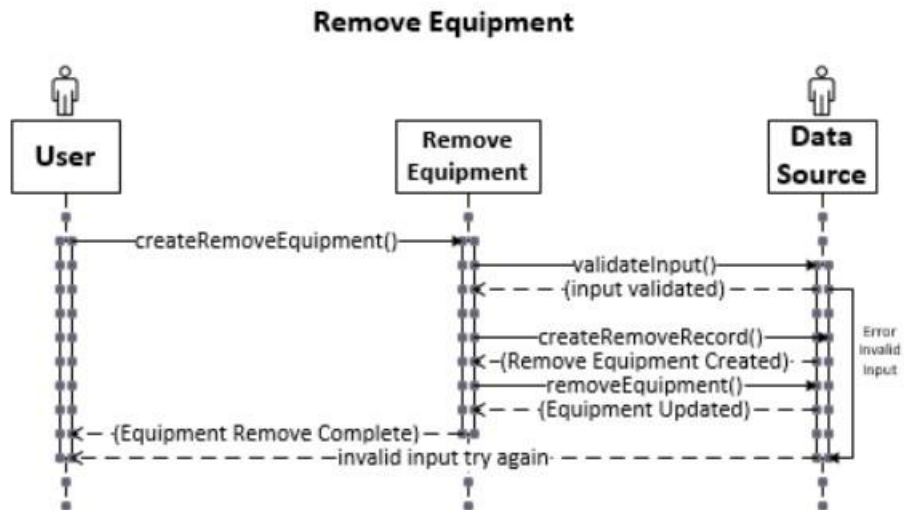
Remove Equipment

Activity Diagrams

Add Activity Diagram
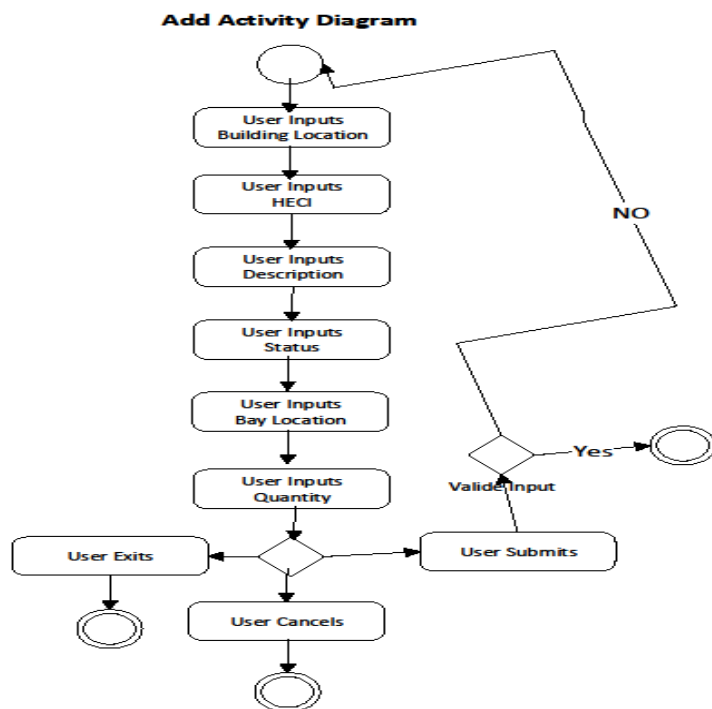
Remove Equipment Activity Diagram
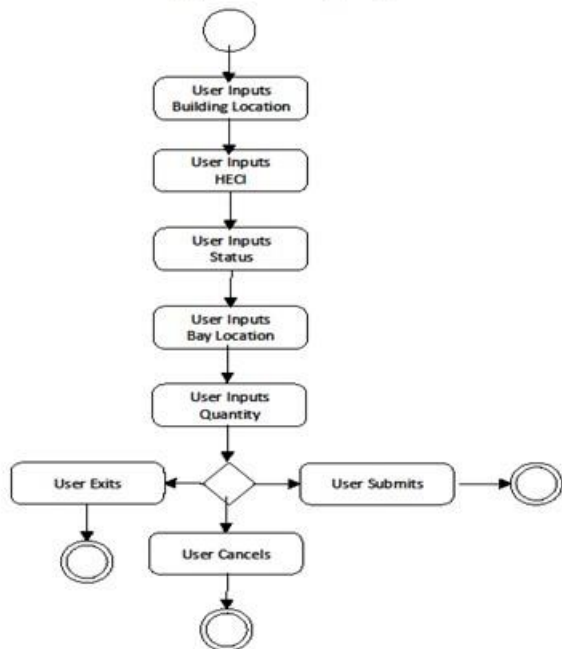
Add Activity Diagram
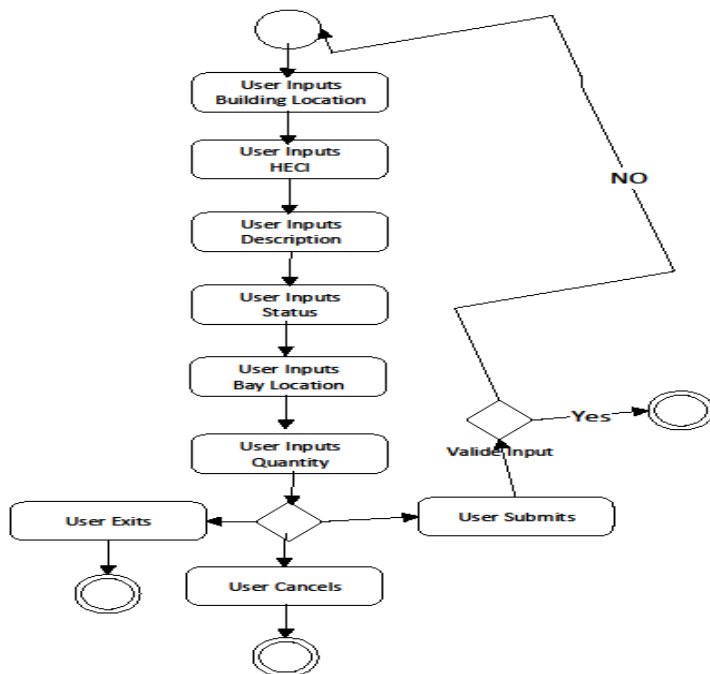
User Interface Specification

Preliminary Design: Shows what happens when user enters information and/or presses a button.

User inputs Login and Password upon pressing submit be taken to Inventory Page (Building Inventory Search page.

User inputs Building Location and any queries into Inventory Page taking them to a list of the Building Inventory.

| Building Location	HECI	DESCRIPTION	COST	BAY LOCATIC	STATUS	QUANTITY
NE0006	SPQ09067	NEC SONET	12000	10005.03	INSTALLED	1
NE0006	SP819276	NEC DUPL	1978	10005.03	INSTALLED	1
NE0006	098765PW	NEC PWR	1242	10005.03	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10005.04	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10000	SPARE	1

User presses add button is sent to Add equipment page.

| Building Location	HECI	DESCRIPTION	COST	BAY LOCATIC	STATUS	QUANTITY
NE0006	SPQ09067	NEC SONET	12000	10005.03	INSTALLED	1
NE0006	SP819276	NEC DUPL	1978	10005.03	INSTALLED	1
NE0006	098765PW	NEC PWR	1242	10005.03	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10005.04	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10000	SPARE	1

User presses Remove button is sent to Remove Equipment page.

Display Inventory

Building Inventory

Building Location	HECI	DESCRIPTION	COST	BAY LOCATIC	STATUS	QUANTITY
NE0006	SPQ09067	NEC SONET	12000	10005.03	INSTALLED	1
NE0006	SP819276	NEC DUPL	1978	10005.03	INSTALLED	1
NE0006	098765PW	NEC PWR	1242	10005.03	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10005.04	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10000	SPARE	1

Submit   **Cancel**   **Add**

Remove

Building Inventory Search

Building Location [ ]

HECI [ ]

Status [ ]

Bay Location [ ]

Quanitty [ ]

Search   **Exit**

User presses cancel on Building Inventory page sent to Building Inventory Search page.

Display Inventory

Building Inventory

Building Location	HECI	DESCRIPTION	COST	BAY LOCATIC	STATUS	QUANTITY
NE0006	SPQ09067	NEC SONET	12000	10005.03	INSTALLED	1
NE0006	SP819276	NEC DUPL	1978	10005.03	INSTALLED	1
NE0006	098765PW	NEC PWR	1242	10005.03	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10005.04	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10000	SPARE	1

Submit   **Cancel**   **Add**

Remove

Building Location	HECI	DESCRIPTION	COST	BAY LOCATIC	STATUS	QUANTITY
NE0006	SPQ09067	NEC SONET	12000	10005.03	INSTALLED	1
NE0006	SP819276	NEC DUPL	1978	10005.03	INSTALLED	1
NE0006	098765PW	NEC PWR	1242	10005.03	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10005.04	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10000	SPARE	1

User presses Display Inventory button sent to Display Inventory page where they can print via browser.

Add Equipment

Building Location _____

HECI _____

Description _____

Status _____

Bay Location _____

Quanitty _____

[Submit]   [Cancel]

[Exit]

Remove Equipment

Building Location _____

HECI _____

Status _____

Bay Location _____

Quanitty _____

[Submit]   [Cancel]

[Exit]

[Display Inventory]

Building Inventory

Building Location	HECI	DESCRIPTION	COST	BAY LOCATIC	STATUS	QUANTITY
NE0006	SPQ09067	NEC SONET	12000	10005.03	INSTALLED	1
NE0006	SP819276	NEC DUPL	1978	10005.03	INSTALLED	1
NE0006	098765PW	NEC PWR	1242	10005.03	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10005.04	INSTALLED	1
NE0006	SPECMON	NEC MON	12890	10000	SPARE	1

[Submit]   [Cancel]   [Add]

[Remove]

User presses cancel in Add Inventory or Remove Inventory sent directly to Building Inventory page.

User Effort Estimator

Use cases and the number of estimated clicks to complete each task.

Use Case	Estimated Minimum Clicks
Login Page	3
Search Inventory	**5**
Edit/Update Inventory	4
Display Inventory	**1**
Add Equipment	5
Remove Equipment	5