

Internal Infrastructure Web Application (IIWA)

FINAL REPORT

Team: sddec22-21

Client: Hinckley Medical LLC

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Version: C

Executive Summary

Development Standards & Practices Used

- Standard website formatting
 - Include a logo in the top left, menu bar on the left, and standard dropdown items.
- HTTPS protocol
 - An HTTPS-Only standard will eliminate inconsistent, subjective determinations across agencies regarding which content or browsing activity is sensitive in nature, and create a stronger privacy standard.
- AES-256 encryption
 - The Advanced Encryption Standard (AES) specifies a FIPS-approved cryptographic algorithm that can be used to protect electronic data. The AES algorithm is a symmetric block cipher that can encrypt (encipher) and decrypt (decipher) information.
- IEEE-23026-2015
 - The goal of this standard is to improve the usability of informational websites and ease of maintenance of managed Web operations in terms of locating relevant and timely information, applying information security management, facilitating ease of use, and providing for consistent and efficient development and maintenance practices.

Summary of Requirements

- App should support Account Creation
- App should have a Home Summary Page
- Inventory Management Page should track inventory
- Shipment Management Page should track shipments
- Serviceability Page should track product service requests

Applicable Courses from Iowa State University Curriculum

COM S 309 - Software Development practices

S E 319 - Construction of user interfaces

S E 329 - Software Project management

COM S 363 - Database Management Systems

S E 339 - Software Architecture and Design

S E 317 - Software Testing

CPR E 431 - Basics of Information System Security

New Skills/Knowledge acquired that was not taught in courses

Cloud Computing

JavaScript Frameworks and packages

JavaScript testing frameworks

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List of figures/tables/symbols/definitions

- Inventory management page
 - a web page where each part is listed in the inventory is listed
 - parts are able to be created with the ability to add/substract quantities
- Shipment management page
 - a web page that lists each shipment to be received
 - Able to enter a inventory part that will be received and it will increment that part when received
 - Control the status of shipments coming in
- Serviceability page
 - a web page that tracks new service requests.
 - The different users will have different abilities
 - The admins will be able to create and delete services
 - Clients can request services only if signed in
- Home Page
 - Will have a summary of all the other pages it will say things such as
 - Services that are needed
 - Low inventory Items
 - Late shipments
 - Need to input for more shipment items

1 Team

1.1 TEAM MEMBERS

COLTON HAZLETT, DUSTIN HEIMS, ANTHONY NUSS,

KEVIN NGUYEN, CHRIS TAN, TY WALLIS

1.2 REQUIRED SKILL SETS FOR YOUR PROJECT

AWS services and implementing them in JavaScript framework react.

Creating a seamless UI in react JavaScript

Database implementation and defining the relationships between tables.

Automating parts of the application to avoid user inputs.

Creating test cases for critical aspects of the web application.

Implementing CI/CD into the git repository for error checking.

1.3 SKILL SETS COVERED BY THE TEAM

AWS services and implementing them in JavaScript framework react.

- Colton, Anthony, Dustin, Chris, Ty, and Kevin

Creating a seamless UI in react JavaScript

- Colton, Anthony, Dustin, and Kevin

Database implementation and defining the relationships between tables

- Ty, Chris

Automating parts of the application to avoid user inputs

- Colton, Anthony, Dustin, Chris, Ty, and Kevin

Creating test cases for critical aspects of the web application

- Colton, Anthony, Dustin, Chris, Ty, and Kevin

Implementing CI/CD into the git repository for error checking

- Colton, Anthony, Dustin, Chris, Ty, and Kevin

1.4 PROJECT MANAGEMENT STYLE ADOPTED BY THE TEAM

The type of project management style that we decided to implement is the Agile approach using Jira software. We organized the project into 2-3 week sprints and created a Gantt chart in Jira. Then we can focus on staying on track to completing the project by the end of the two semesters. In the sprints it was broken into frontend and backend development.

1.5 INITIAL PROJECT MANAGEMENT ROLES

Colton - Project Manager, Security & Frontend

Dustin - Security & Frontend

Anthony - Frontend

Kevin - Frontend

Ty - Backend

Chris - Backend

2 Introduction

2.1 PROBLEM STATEMENT

The sponsor company Hinckley Medical LLC does not currently have an effective way of tracking and managing internal operations. To improve day-to-day operations we are creating a web application to offer these services.

2.2 REQUIREMENTS & CONSTRAINTS

Our project requirements are role-based. Roles are listed with the requirements using the following key:

A: Admin users

DH: Department Head users

E: Employee users

G: Guest users

Basic webapp requirements (all users):

- Log in
- Sign up
- Serial number entrance

- Needed to gain access to some of the other pages
- When logged in
 - Menu to navigate to all other pages

Inventory management requirements:

- Create/edit inventory item (A)
- Subtract/Add quantity of item (A,E)
- Notify low inventory - on dashboard (A, E)
- View all inventory items (A, E)
- Search inventory items by labels, part numbers, and part names (A, E)

Shipment management requirements:

- Add/approve new shipment (A, E)
- View old & pending shipments (A,E)
- Edit old (locked) shipments (A)
- Search by bath no, manufacturer, PO
- Filter by label

Serviceability management requirements:

- RFS (G, DH)
- S/N List owned by department (DH)
- List of current RFS (DH)
- RFSA (A, E)
- List of current RFSA (A, E)
- Close RFS/RFSA (A, E)

2.3 ENGINEERING STANDARDS

1. Standard website formatting. Include a logo in the top left, menu bar on the left, and standard dropdown items.
2. HTTPS protocol a. An HTTPS-Only standard will eliminate inconsistent, subjective determinations across agencies regarding which content or browsing activity is sensitive in nature, and create a stronger privacy standard.
3. AES-256 encryption a. The Advanced Encryption Standard (AES) specifies a FIPS-approved cryptographic algorithm that can be used to protect electronic data. The AES algorithm is a symmetric block cipher that can encrypt (encipher) and decrypt (decipher) information.
4. IEEE-23026-2015 a. The goal of this standard is to improve the usability of informational websites and ease of maintenance of managed Web operations in terms of locating relevant and timely information, applying information security management, facilitating ease of use, and providing for consistent and efficient development and maintenance practices.

2.4 INTENDED USERS AND USES

1. Hinckley Medical benefits
 - a. Organized and easy to use inventory tracking
 - b. Organized and easy to use shipment tracking
 - c. Effortless serviceability for when a department requires a product to be serviced
2. People/Departments who bought the product benefits
 - a. Easy access to product information
 - b. Ability to request a product to be serviced

3 Project Plan

3.1 PROJECT MANAGEMENT/TRACKING PROCEDURES

We chose a waterfall + agile approach for the management style. The main reason being is that we had to have certain things done by certain times to continue with different aspects of the project and we set goals to have those done so we could continue. We had 2 week sprints that would help us keep these goals in mind and continue at a good pace on the project. We used Jira to track our schedule on the project and with the help of github we kept our code all localized so that we could work on it at any time.

3.2 TASK DECOMPOSITION

Breaking the project into different parts is an easy way for each of the parts of the project to get done without having to wait on each other. How we have it broken up is we work in teams of two and work on separate aspects of the project. One group works on the frontend and some on the backend.

Our main tasks for this project include:

- User account creation
- Inventory management page
- Shipment management page
- Home dashboard page that has general information about each page
- Serviceability page to schedule maintenance

3.3 PROJECT PROPOSED MILESTONES, METRICS, AND EVALUATION CRITERIA

In semester one there were 3 major milestones; 1 being the creation of the shipment page, 2 of the inventory page, and 3 of the login page. Each of these pages need to be functional and is part of the core functionality of Hinckley Medical LLC's website that they requested. Our goal was to get these core functionalities up and running so they can start using it by the end of semester.

The shipment page would keep track of all the incoming and outgoing shipment orders within the company. The inventory page would keep track of all in-house parts and display various information about those parts. The inventory page is also linked to the shipment page in the sense that when you receive something it will have been initially from the shipment page. Additionally from the shipment page you would be able to change the inventory of items. This would allow us to have the ability to show if an order is good because you don't have to manually change it on the inventory

page. Lastly the login page would help the company organize permissions of users accessing the website such as guest, employee and admin.

In semester 2 our goal was to finish the inventory and shipment pages with all of the user experience enhancements completed such as editing and deleting items, filtering and searching items etc. We also wanted to create the serviceability page that tracks service requests through the process of being serviced.

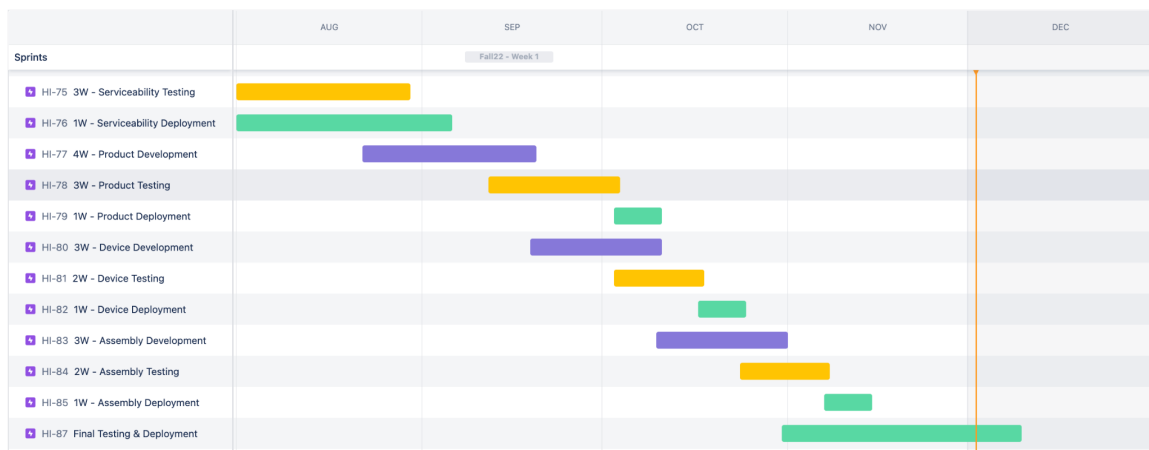
3.4 PROJECT TIMELINE/SCHEDULE

Below is a detailed breakdown of our estimated schedule for both semesters

Semester 1:

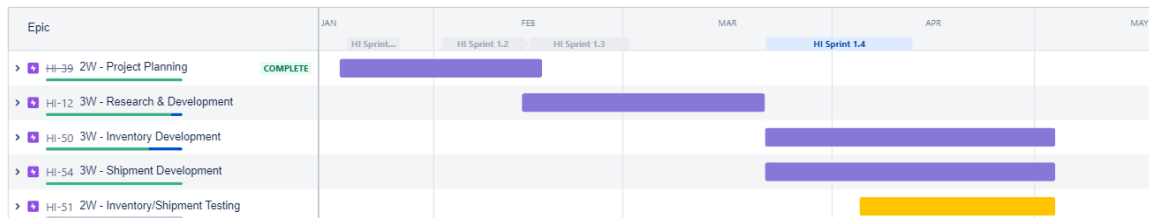


Semester 2:



below is our actual schedule for both semesters

Semester 1:



Semester 2:



3.5 RISKS AND RISK MANAGEMENT/MITIGATION

Not too many risks are brought up with the creation of this product. The only one of major significance is the idea of user data getting stolen and that can be fixed through the implementation of securing personal information with hashing or any other method that AWS provides to us already.

3.6 PERSONNEL EFFORT REQUIREMENTS

Each of our team members were required to work on the project a certain amount of time each week but it can vary on the amount of time that they actually work on the project. The amount of time each of the group members worked on the project varied from 5 hours to 10 hours each week. Each member is assigned roles and responsibilities for each week. It is there responsibility to spend time each week working on their given task.

3.7 OTHER RESOURCE REQUIREMENTS

The other type of resource that we needed for the project was for financial help. As AWS offers many different services and allows you to “pay as you go” meaning it will be more expensive the more it is used. We entered the AWS free tier to help with these costs and it offers most of our services for free while we are in the development phase. They check the usage amounts by the month and then it resets. If we go over the free tier amount then we get charged the normal amount. We also applied for \$300 in AWS credit which should cover the financial needs for the development of the project.

4 Design

4.1 DESIGN CONTEXT

4.1.1 Broader Context

Area	Description	Examples
Public health, safety, and welfare	Our inventory system will save HM employees time by streamlining the shipment receiving process.	Increasing/reducing exposure to pollutants and other harmful substances, increasing/reducing

		safety risks, increasing/reducing job opportunities
Global, cultural, and social	N/A	Development or operation of the solution would violate a profession's code of ethics, implementation of the solution would require an undesired change in community practices
Environmental	N/A	Increasing/decreasing energy usage from nonrenewable sources, increasing/decreasing usage/production of non-recyclable materials
Economic	Our Infrastructure App will increase productivity and save the company worker-hours that would otherwise be used to manually track inventory and warranty status.	Product needs to remain affordable for target users, product creates or diminishes opportunities for economic advancement, high development cost creates risk for organization

4.1.2 User Needs

PARAMEDIC needs a way to SUBMIT A CUSTOMER SERVICE REQUEST because PRODUCT BROKE.

DEPARTMENT HEAD needs a way to ORDER REPLACEMENT PARTS because PRODUCT BROKE.

ADMIN needs a way to CHANGE PART CATALOG because PART NUMBER/SOURCE CHANGED.

EMPLOYEE needs a way to TRACK INVENTORY because HE/SHE NEEDS TO KNOW WHEN TO ORDER MORE PARTS.

4.1.3 Prior Work/Solutions

When looking at other examples for page layout we find many examples online that we can follow along with, and these help a ton. Have a template design that someone says works really well and they explain every part of the design they created. It is easy for us as a group to take that and change it to our liking and use it as a base line.

4.1.4 Technical Complexity

With our project being software based there are always ways that we can improve code that we find helpful and can use for ourselves. For the frontend we used Javascript react with backend on AWS and with these two components we are creating from the ground up, a system that Hinkley Medical can use in day to day life. What they asked for was to create many different aspects of the website, everything ranging from inventory, shipment, profile, serviceability. Each of these components are

very different from each other and required a different way of thinking on how we are to create them.

4.2 DESIGN EXPLORATION

4.2.1 Design Decisions

1. Using AWS as backend was a very smart choice as it is easy to create and use for our project.
2. Having an overall design layout of what each page is going to look like as a template.
3. Using widgets in our pages make them look more professional and gives it more ease of use which is always smart to have.

4.2.2 Ideation

We came to widgets from many different ideas:

1. Drop down menu
2. Color coordinated parts
3. Pop up window
4. Seperate page loading
5. All info displayed without having to press a button

4.2.3 Decision-Making and Trade-Off

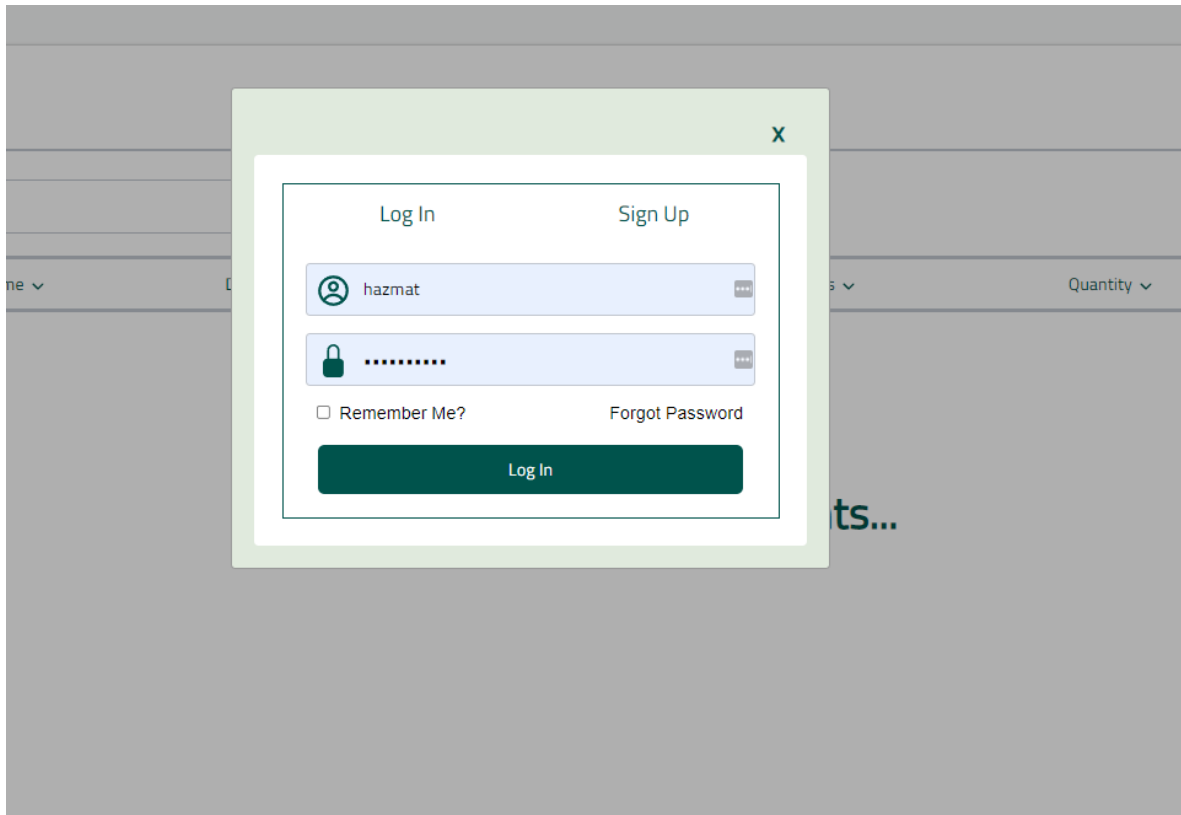
1. Drop down menu:
 - a. Pros: Easy access for menu
 - b. Cons: If too many options could confuse client
2. Color coordinated Parts:
 - a. Pros: Easier to see certain things like titles/menus
 - b. Cons: Too many colors could confuse client
3. Pop up window:
 - a. Pros: Clears up space and makes it less cluttered
 - b. Cons: Might be annoying for the client (new window may cause performance issues)
4. Separate Page Loading:
 - a. Pros: Clears up space like a pop up window and makes it less cluttered
 - b. Cons: May cause performance issues
5. All info displayed without having to press a button
 - a. Pros: Easy access for information needed
 - b. Cons: Could be overwhelming to look at

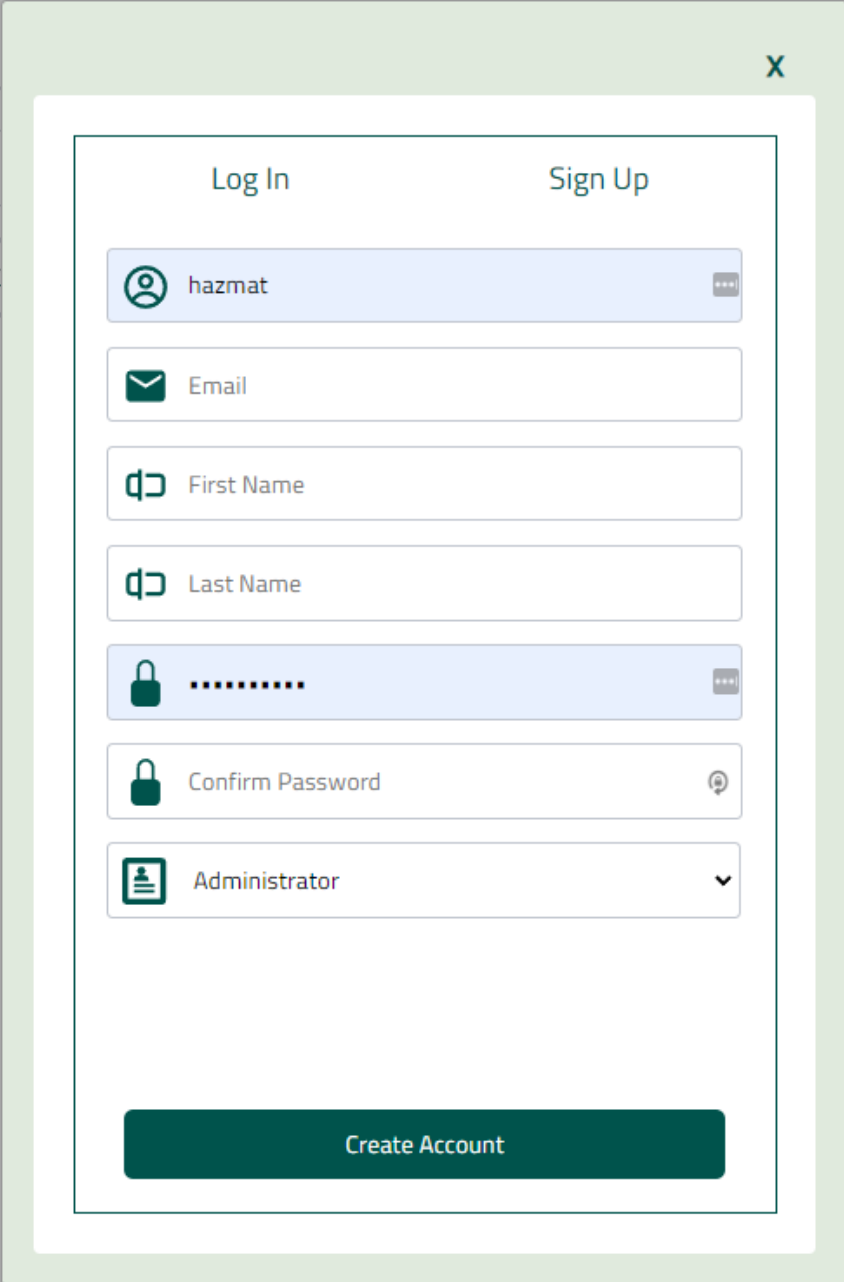
4.3 PROPOSED DESIGN

This final semester we have finished up the last of the inventory and the shipment page. This then lead to the making of the Serviceability page. All of these are set up with the CI/CD pipeline to be tested. This semester we have completed the four main pages that are being used by the company for them to use.

4.3.1 Design Visual and Description

#1 Login/Signup page





The screenshot displays a user authentication form with the following elements:

- Two tabs: "Log In" (active) and "Sign Up".
- Username field: "hazmat" with a user icon and a toggle for visibility.
- Email field: "Email" with an envelope icon.
- First Name field: "First Name" with a person icon.
- Last Name field: "Last Name" with a person icon.
- Password field: Masked with "....." and a lock icon and toggle.
- Confirm Password field: "Confirm Password" with a lock icon and a toggle.
- Role dropdown: "Administrator" with a person icon and a dropdown arrow.
- Primary button: "Create Account" in a dark green box.

The first screenshots (#1) is our implementation of the logging and signing up feature. There is a button in the top right corner of the site for logging in. After logging in there will be a profile tab in place of the login button.

#2 Shipment Page

Hi, Colton

Shipments

Export to Excel + New Order

Search Batch Number

Date Supplier Labels Status

Batch No	Part Name	Date	Supplier	Labels	Quantity	Status
AB1000-1	Amp Boards	03/31/2022	JLPCB	Loadcell Casing	150	Received
OB1000-2	PWS-100B	03/27/2022	Perrin	Overlays	20	Received
OC1000-1	PWS-100C	03/27/2022	Perrin	Overlays	3	Received
MB1000-1	Main Board	01/10/2022	JLPCB	Main Casing	50	Received
PH1000-1	PH 4in	12/31/2021	KRCD Elec.	Wires	400	Received
PH2000-1	PH 6in	12/31/2021	KRCD Elec.	Wires	700	Received
PH3000-1	PH 7.5in	12/31/2021	KRCD Elec.	Wires	900	Received
PH4000-1	PH 11.5in	12/31/2021	KRCD Elec.	Wires	200	Received

Order Num: MICHAELO21122
Order Date: February 16, 2022
Delivery Date: March 28, 2022
Supplier: Perrin
Main Contact: Pat Crowley
Received By: ad1cf83a-a537-40ba-a065-f6ecdf7768c4
Inventory Quantity: 57
Cost / Unit: \$93.16
Other Cost: \$0.00
Total: \$NaN

Search Inventory Part(s)

Part Name(s):

Q Select... ▼

- Amp Board (Loadcell Casing) X
- Main Board (Main Casing) X

+ Add another item

Cancel Continue

03/27/2022 Perrin Overlays

Create New Shipment
X

JLCPCB

Order Number: 🔒

Order Date: **Estimated Delivery:**

Amp Board

Quantity:	Cost/Unit:	Batch Number:
<input type="text" value="10"/>	<input type="text" value="11.99"/>	<input type="text" value="AB1000-2"/>

Main Board

Quantity:	Cost/Unit:	Batch Number:
<input type="text" value="10"/>	<input type="text" value="8.97"/>	<input type="text" value="MB1000-2"/>

Shipping/Other:	Total:	
<input type="text" value="10.00"/>	<input type="text" value="20.96"/>	<input type="button" value="Back"/> <input type="button" value="Review >"/>

Review Shipment
X

test123

Supplier: JLCPCB

Order Date: April 20, 2022

Estimated Delivery: April 24, 2022

Amp Board (Loadcell Casing)

Quantity:	Cost/Unit:	Batch No:
<input type="text" value="20"/>	<input type="text" value="\$11.99"/>	<input type="text" value="AB1000-2"/>

Main Board (Main Casing)

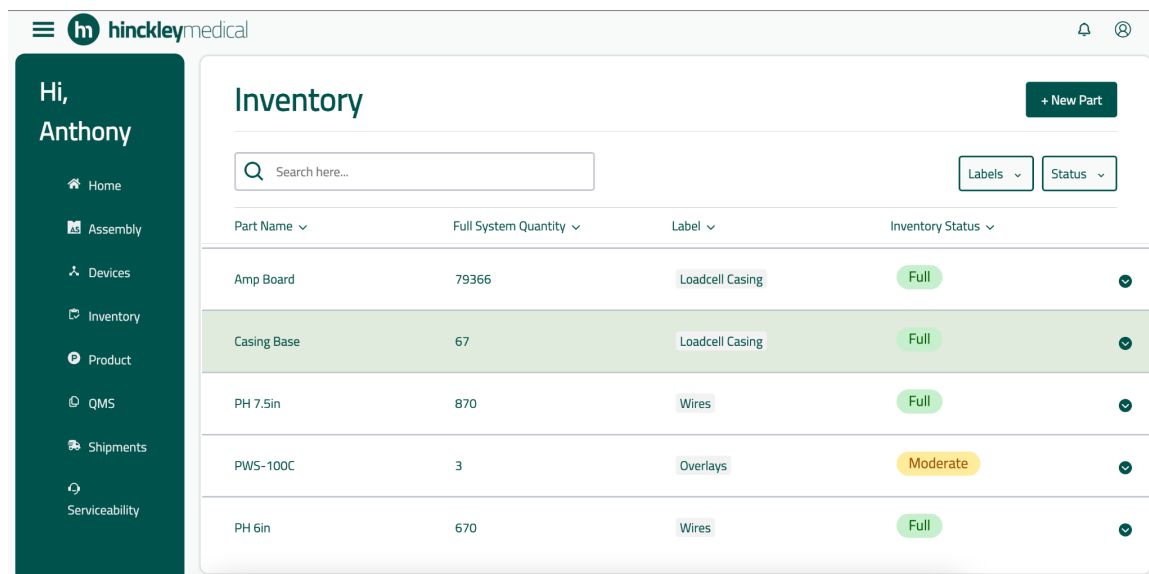
Quantity:	Cost/Unit:	Batch No:
<input type="text" value="50"/>	<input type="text" value="\$8.97"/>	<input type="text" value="MB1000-2"/>

Shipping/Other:	Total:	
<input type="text" value="\$12.89"/>	<input type="text" value="\$701.19"/>	<input type="button" value="Previous"/> <input type="button" value="Create"/>

The second screenshot (#2) shows the site's sidebar which is able to slide in and out when clicking on the menu button next to the Hinckley medical logo. Each page has a separate button inside of this sidebar. In this screenshot, we are on the shipment page. Each shipment is displayed with characteristics displayed for each. Each shipment has a dropdown displayed when clicking on it. We have the backend connected to the shipment page so the items displayed are the current items the sponsor company provided us. Export to Excel button will take all of the shipments and allow you to download them in excel form. In the first screenshot it can be seen that the drop down has a edit button that if you have an incorrect shipment you can delete it and even delete the shipment once it is completed.

The other screenshots for the shipment page show the steps to create a new shipment item. First, you need to select an inventory part, otherwise create a new inventory part (pending). You can have multiple inventory parts in one order as long as they are from the same supplier. Then it requires you to fill in the information about the shipment on the Create New Shipment page. Lastly, before creating the shipment it has you review the information for typos or anything that could have been inserted wrong.

#3 Inventory page



The screenshot displays the 'Inventory' page of the Hinckley Medical system. The sidebar on the left shows the user's name 'Hi, Anthony' and navigation links for Home, Assembly, Devices, Inventory, Product, QMS, Shipments, and Serviceability. The main content area features a search bar, a '+ New Part' button, and a table of inventory items. The table has columns for Part Name, Full System Quantity, Label, and Inventory Status. The items listed are:

Part Name	Full System Quantity	Label	Inventory Status
Amp Board	79366	Loadcell Casing	Full
Casing Base	67	Loadcell Casing	Full
PH 7.5in	870	Wires	Full
PWS-100C	3	Overlays	Moderate
PH 6in	670	Wires	Full

The screenshot shows a web application interface for 'hinckleymedical'. The main content area is titled 'Inventory' and features a search bar and a table of items. The table has columns for 'Part Name', 'Full System Quantity', 'Label', and 'Inventory Status'. One item is visible: 'Amp Boards' with a quantity of 16 and a status of 'Full'. A modal window is open, displaying details for a selected part: 'Loadcell Casing'. The modal includes fields for 'Uri' (0.9B), 'Cost per unit' (0.9B), 'Amount PWSA' (15), 'Amount PWSB' (18), and 'Supplier ID' (27e3cb28-d414-46f8-b377-5baf3e). There is an 'Edit' button at the bottom of the modal. The sidebar on the left contains navigation links: Home, Assembly, Devices, Inventory, Product, QMS, Shipments, and Serviceability. The user is identified as 'Hi, Dustin'.

The screenshot shows a modal window titled 'Add a New Part'. The form contains the following fields and controls:

- Part Name:** Text input field.
- Quantity:** Text input field.
- Supplier:** Dropdown menu with a search icon and 'Select...' text.
- Part Cost:** Text input field.
- Label:** Dropdown menu with a search icon and 'Select...' text.
- Website:** Text input field.
- Amount PWSA:** Text input field.
- Amount PWSB:** Text input field.

At the bottom of the modal, there are two buttons: 'Cancel' and 'Save'.

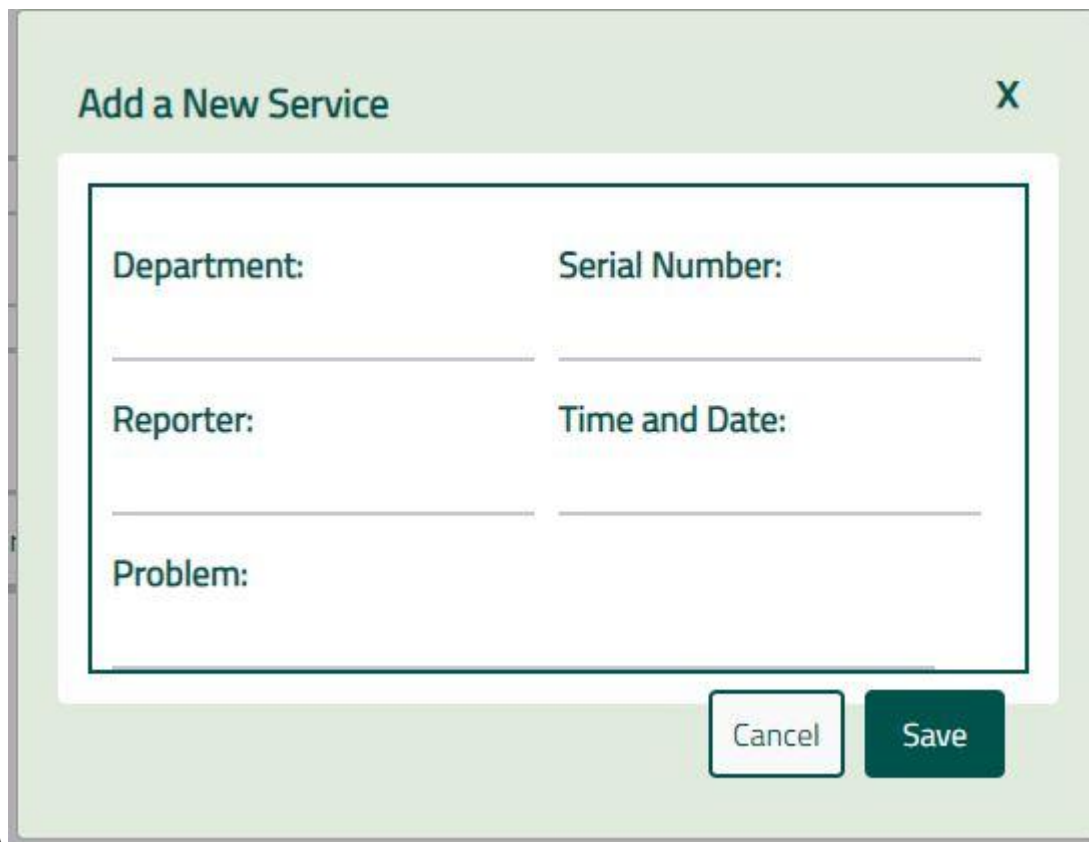
The third screenshot (#3) is our implementation of the inventory page. The inventory page has similar characteristics as the shipment page. Each part is displayed and has a dropdown for each that will display more information about each. The inventory has a button to create a new part. The button will open a popup as shown where you can insert characteristics about the new part that will be populated into the inventory when successfully created. In the second screenshot it is show that when clicked on it will give more information about the part. This is good for general use and to make the page look better and not have so much information when the page first loads up.

#4 Serviceability Page

The below screenshot shows the serviceability page. This page is used by the employer and the clients. The clients would request for a service on a part and then on the other side the admin would be able to complete the serviceability and see information about it. The first screenshot is of the general page with all of the different services that can be seen in a list. The second screenshot is of the employees being able to add services and delete them once completed.

The screenshot displays the 'Serviceability' page in a web application. The page features a dark green sidebar on the left with the user's name 'Hi, Dustin' and a list of navigation items: Home, Assembly, Devices, Inventory, Product, QMS, Shipments, and Serviceability. The main content area is titled 'Serviceability' and includes a '+ New Service Request' button in the top right corner. Below the title is a search bar with the placeholder text 'Search here...'. Underneath the search bar are three filter buttons: 'To Do', 'In Progress', and 'Closed'. The main part of the page is a table with the following columns: Department, Serial Number, Date Requested, Problem, and Status. The table contains five rows of data, all representing service requests from 'Hennepin EMS' with serial number 'B00010021', dated '4:29 PM December 5, 2022', with a problem code of 'E-07' and a status of '0'.

Department	Serial Number	Date Requested	Problem	Status
Hennepin EMS	B00010021	4:29 PM December 5, 2022	E-07	0
Hennepin EMS	B00010021	4:29 PM December 5, 2022	E-07	0
Hennepin EMS	B00010021	4:29 PM December 5, 2022	E-07	0
Hennepin EMS	B00010021	4:29 PM December 5, 2022	E-07	0
Hennepin EMS	B00010021	4:29 PM December 5, 2022	E-07	0



The image shows a modal window titled "Add a New Service" with a close button (X) in the top right corner. The form contains the following fields:

- Department: _____
- Serial Number: _____
- Reporter: _____
- Time and Date: _____
- Problem: _____

At the bottom right of the modal, there are two buttons: "Cancel" and "Save".

4.3.2 Functionality

The current design includes every functional requirement given by Hinckley medical for the pages that we have been working on. It also features many non-functional requirements that will enhance the experience of using the site. Some of these include a moving sidebar that is able to hide when staying on one page and other dropdowns that can be hidden to provide a clean user experience without unnecessary distractions. As we work on the other pages of the project we will make sure it meets all the sponsor companies requirements.

4.3.3 Areas of Concern and Development

That the product might not meet the requirements that they are looking for in the inventory and ordering of parts of the project. Also, for the shipment page making it too complicated to use by having too many user inputs and steps to create a new shipment.

We organize the project into the required tasks so there won't be any missed requirements. We used Jira to organize all of the tasks that we are required to work on. We also shared major project achievements with our client and allow them to provide feedback.

4.4 TECHNOLOGY CONSIDERATIONS

The strengths in the technology that we chose were:

- React JavaScript Framework is fast and has great pre-built packages
- AWS amplify is easy to implement with react
- AWS cognito for user based encryption
- AWS DataStore allows for offline access and will sync when connected to the internet

The weaknesses of the technology that we chose were:

- Accessibility, because of how AWS amplify charges the website will only be able to be accessed in the midwest region initially until the sponsor company decides they want to expand

4.5 DESIGN ANALYSIS

Did your proposed design change from CPRE 491?

We were very ambitious with our design plans in cpre 491. We initially planned on creating several other pages along with what we had completed. We eventually realized that we needed to reorganize our schedule of work and focus on creating a quality application over trying to implement as much as possible. We worked with our client to agree on what we wanted to complete to finish the project.

We also ran into various scenarios on how we wanted different functionalities to work after brainstorming. These lead to changes in several pages. An example was how we were editing inventory part items. We initially planned on being able to edit every detail of a part. We then found that this would not be an ideal solution with inventory parts being linked to different areas of the application. We changed our design to only allow users to change certain details of a part.

4.6 DESIGN PLAN

We created a Miro board wireframe with every page to meet the overall requirements. Each page has its own functionality with the different roles described. It also has user capability roles, design inputs, and known database items. In this board we also describe each user role in depth and the structure of our databases. There are also links to useful resources as well as security ideas.

Our Miro board can be viewed using the following link:

https://miro.com/app/board/uXjVOQ2GbiI=/?share_link_id=323438907833

5 Testing

5.1 UNIT TESTING

The units that were tested are most of our function calls that have a critical render that will change the UI in react. We used what it is supposed to do and also have a few edge cases for most of the test cases. Example units would be our login functionality.

Each member in the group created their own unit test cases for the functions that they created.

The tools that were used are react testing libraries Jest & Cypress.

5.2 INTERFACE TESTING

The interface testing that was done is for our calls to the web server that we are using. For the project it is AWS and we used multiple different services such as, Coginto, Amplify, DynamoDB, DataStore, DataSync, and CloudWatch.

We validate any edge cases so these services do not crash and it will be scalable with our web application.

5.3 INTEGRATION TESTING

Integration testing is important for inserting everyone's work into each other and validating that nothing from someone else's part will break another. The critical integration path would be from moving from page to page in the design from any part of the project. Also, validating that when we are working on a part of the website that requires a submission it will be able to store the item as a draft.

5.4 SYSTEM TESTING

Inventory:

- Add/Remove/Edit Inventory items
- Auto increment inventory amount by shipment
- Filter and search inventory list

Shipment

- Add/Remove/Edit shipments in list
- Filter and search shipment list

Serviceability

- Add/remove services

Home

- Have generalized tables that give important information about the other pages

5.5 REGRESSION TESTING

Any pushes that affect old functionality is ran through our CI/CD pipeline inside of gitlab.

5.6 ACCEPTANCE TESTING

We involved our client in the acceptance testing by allowing them to use our project and design. Since the clients are testing it, this ensures that the software meets and performs according to the client's expectations.

5.7 SECURITY TESTING (IF APPLICABLE)

Security Testing was done on the sign in credentials of the login page. This means that the passwords, usernames, etc are saved properly and not able to be stolen by malicious hackers.

5.8 RESULTS

All tests are passing as we transition to giving our client our project

6 Implementation

We created a Home page so users can easily access the most important information on our website all at once. A shipment page that tracks incoming part shipments to auto increment inventory quantities. An inventory page that keeps track of all items in their inventory. A serviceability page where users can submit a ticket of broken/faulty products that need to be serviced on so they can ship new products out to the clients.

The functionality of the website provides increased productivity with the use of a user friendly interface. The website is tested to work and mitigate bugs when users are accessing the site during their day to day work time.

7 Professionalism

7.1 AREAS OF RESPONSIBILITY

<u>Area of Responsibility</u>	<u>IEEE Code of Ethics</u>
Work Competence	To maintain and improve technical competence.
Financial Responsibility	Honest estimates, reject bribery, give proper credit to the contribution of others.
Communication Honesty	Protect others' privacy, and disclose conflicts to affected parties.
Health, Safety, and Well-Being	To hold paramount the safety, health, and welfare of the public. Treat all fairly.
Property Ownership	To accept criticism, correct errors, and give credit to whom it is due.
Sustainability	To strive to comply with sustainable development practices. Reveal factors that might endanger the environment without delay.
Social Responsibility	Improve the understanding of society about emerging technologies.

The NSPE Canon focuses solely on values like Honesty and Integrity and Honorable Conduct. The IEEE code of ethics focuses on these values too, but also adds a performance and knowledge aspect. Where the NSPE Canon says to only perform services in your area of expertise, IEEE CoE says to strive to expand your areas of expertise. Where the NSPE says to give credit where credit is due, IEEE adds that we should accept criticism as well as credit for our own work. The IEEE promotes life-long learning and the bettering of oneself, not just maintaining one's honor and integrity.

7.2 PROJECT SPECIFIC PROFESSIONAL RESPONSIBILITY AREAS

<u>Area of Responsibility</u>	Project's Professional Context	Team Performance
Work Competence	This very much applies to our project. All of us have backgrounds in some of the required technologies required for this project, and those backgrounds were used when determining our initial project management roles. Since then we've all also had to learn new skills and expand our areas of expertise as needed to meet project requirements, as outlined in the IEEE code of ethics.	High
Financial Responsibility	This doesn't really apply to our project, since no major investments have been needed so far. The AWS fee estimates that we have calculated have been accurate to our knowledge and fully disclosed to our sponsor company.	High
Communication Honesty	Communication between our group has always been open and honest. We all understand that dishonesty and conflict only create more problems, and that if we all work together we will be much more productive.	High
Health, Safety, and Well-Being	This doesn't really apply to our project. It is purely software development, so there aren't	N/A

	any physical safety concerns.	
Property Ownership	We never take credit for another group member's work in our weekly status reports. Each member of the team is able to share and claim their own accomplishments. We are also always open to constructive criticisms from other members of the group if something we create is not up to par with expectations.	High
Sustainability	Also not really applicable. Our project won't have any impact on the environment.	N/A
Social Responsibility	N/A. This is not an educational project.	N/A

7.3 MOST APPLICABLE PROFESSIONAL RESPONSIBILITY AREA

We believe that Work Competence is the most applicable area of responsibility relative to our project. Being accountable for only accepting responsibilities that we are capable of handling ensures that we are able to proceed with our project in a timely manner without having to backtrack and redo someone's work because they didn't know what they were doing.

8 Closing Material

8.1 DISCUSSION

The project is in a finished state to be ready to be delivered to the client.

8.2 CONCLUSION

We reached the requirements from our client company and have provided an application that they will be able to use in their day to day operations. We have finished the project in a state that they will be able to use without errors.

The only constraint that we met from time to time was the time we had to work on the project with all of the group members having such busy schedules it was sometimes difficult to find time to work on it. What we could have done differently from the start of the project is maybe have a more defined testing method to test what we have done.

8.3 REFERENCES

M. Hollands, "Amplify," *Amazon*, 2015. [Online]. Available: <https://aws.amazon.com/amplify/>. [Accessed: 25-Apr-2022].

“React icons - github pages.” [Online]. Available: <https://react-icons.github.io/react-icons/>. [Accessed: 25-Apr-2022].

8.4 APPENDICES

Our Miro board can be viewed using the following link:

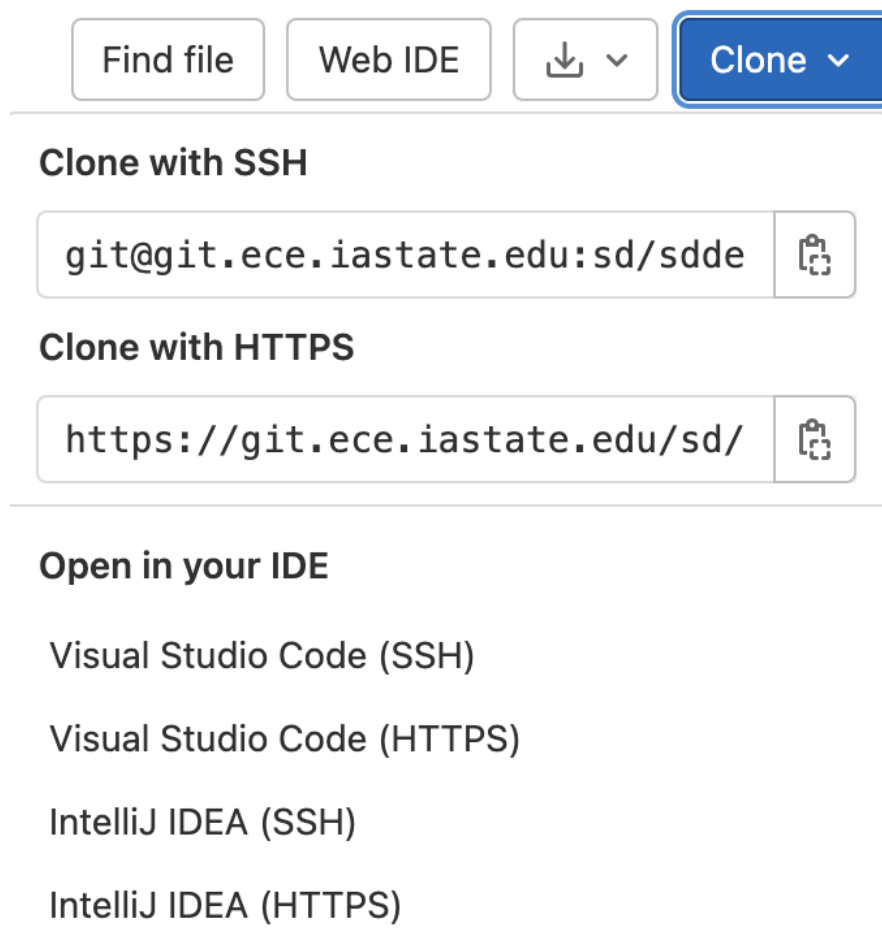
https://miro.com/app/board/uXjVOQzGbiI=?share_link_id=323438907833

8.4.1 Operation manual

To use the application you will need to do several steps:

You're required to be using ISU network either being on campus or using a vpn to access the gitlab project.

head to <https://git.ece.iastate.edu/sd/sddec22-21> and click on clone and copy the https link



The image shows a user interface for cloning a repository. At the top, there are four buttons: "Find file", "Web IDE", a download icon with a dropdown arrow, and "Clone" with a dropdown arrow. The "Clone" dropdown is open, showing two main sections: "Clone with SSH" and "Clone with HTTPS". Under "Clone with SSH", there is a text input field containing the SSH URL: `git@git.ece.iastate.edu:sd/sdde` and a copy icon. Under "Clone with HTTPS", there is a text input field containing the HTTPS URL: `https://git.ece.iastate.edu/sd/` and a copy icon. Below these sections, there is a section titled "Open in your IDE" with four options: "Visual Studio Code (SSH)", "Visual Studio Code (HTTPS)", "IntelliJ IDEA (SSH)", and "IntelliJ IDEA (HTTPS)".

Go into your terminal on your system and enter the following into a folder location of your choice

git clone <https://git.ece.iastate.edu/sd/sddec22-21.git>

run:

cd orion

install the react dependencies using:

npm install

to run the application enter:

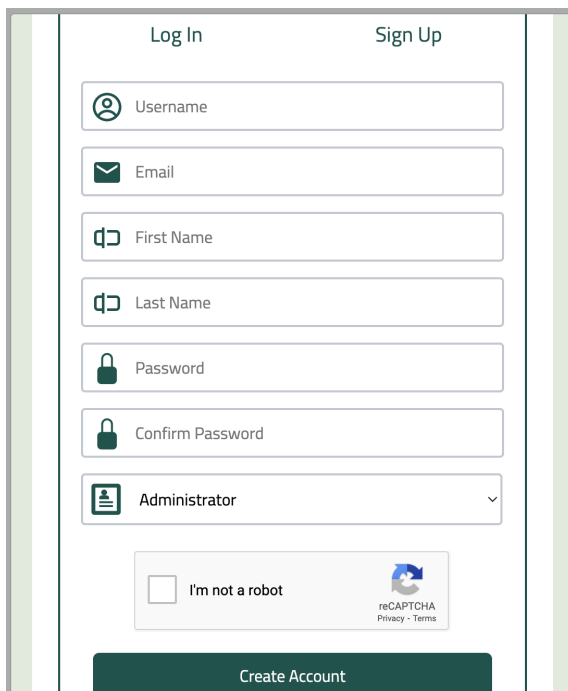
npm start

After the application has opened into your web browser, you will need to create an account to access information on the site.

press login in the top right corner of the page



enter the required information and you will be prompt to enter a confirmation code send to your email address.



after successfully creating an account you will be able to sign in and access the site.

8.4.2 Intial designs

Our initial design included extra pages that were not included in the final design

- Device management page to track active devices
- Product information page that holds information about each product
- Assembly page to help guide the process

Device information management requirements:

- Create/Edit/Delete device information
- Calibrate devices
- View devices information
- Notified when calibration is due
- Search device by S/N or filter by label or department

Product information management requirements:

- User manual (Downloadable)
- Link to service request page
- Selectable list of products owned by a department
 - DH can only view list of products his department owns
 - Administrators can view all departments to see the list of products they own
- Individual product

- Warranty information
 - Status
 - Expiration
- Purchase date
- Service History
- List of components with Batch No.
- Link to that products device tracking page
- Searchable by S/N, department name, batch no.

Assembly Tracking requirements:

- Select an assembly tile to start the step
- Input needed fields per assembly tile
- Complete an assembly with the option to auto-decrement inventory items

These were scrapped after first semester. We had realized that we were over ambitious with our planning of the project and didn't realize how much time the implemented pages would take to develop. We worked with our client to create new requirements after we had a better understanding of our time estimates.