Business Requirements Document
PPE Inventory and Distribution Solution

Prepared for
HHA 502- Health Information Systems

Last Modified on 11/23/2021

Document Purpose

This Business Requirements Document includes the system requirements for the new Personal Protective Equipment (PPE) management system for Long Island Sound Health System. This document describes what the end product must accomplish and details regarding its implementation within the health system workflow. Once all of the components within this document have been signed off on, set up and testing for the new system will take place.

The IT director, IT analyst and administrative staff working with the current tracking system will work closely with the product development team to create the functional design and ensure tailored customizations for the organization are included.

The diagram below describes how PPE is currently being tracked and managed.

Long Island Sound Health System (LISHS) Current State
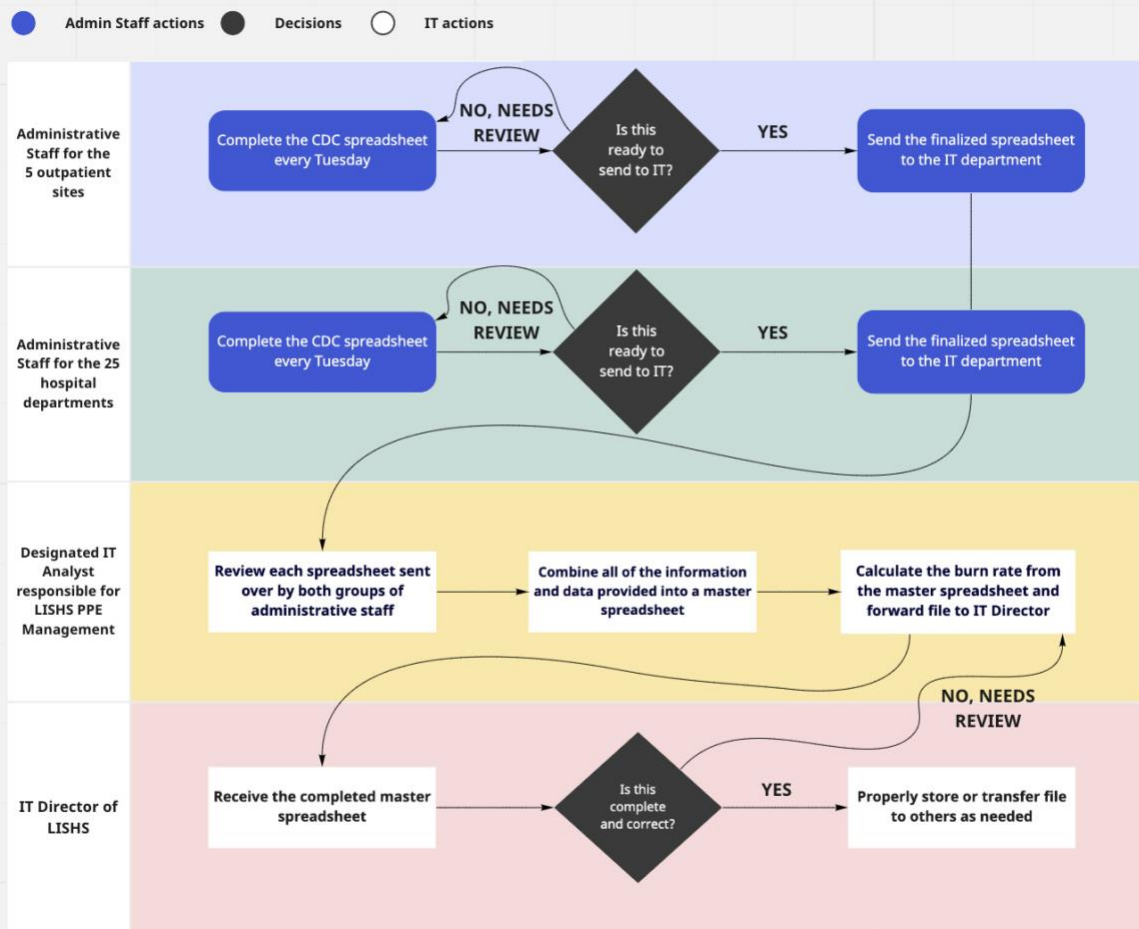
Project Assumptions

- The product development team will contact the IT director, IT analyst, and administrative staff for both the outpatient locations and hospital departments before they begin building the new system to ensure that the listed requirements are accounted for.

- The product development team will include the group of individuals enlisted above when identifying the infrastructure needed to sustain the new system, prototype designs and set up before testing begins.

- The IT team and administrative staff will be included at each step in the system's implementation and rollout process.

- Any issue or concern during the product's developmental stages will be recorded within this document and communicated to the entire team immediately.

- If a specific requirement cannot be met due to development limitations, this will be communicated to the IT team and administrative staff before adjustments are made by any individual or group.

- Any adjustments made will be recorded within this document. These changes must be agreed upon by the IT team, administration, and the product development team. All parties involved in the making of this system need to sign off on all changes.

- All parties involved will agree on the material within this document and sign to confirm their agreement before system testing begins.

- All parties are aware of their roles and responsibilities that will come from this work flow change and will communicate any concerns to administrative staff.

- All parties will agree on the testing plan and formulate a Go-Live checklist before launching the system in both the outpatient sites and hospital floors.

- The IT department understands that they will be the personnel responsible for the maintenance of the new PPE tracking and dispensing system.

- The author(s) of this document can freely edit its content, but will confirm any additions or new information with the rest of the group.

Table of Contents

1 BRD Summary and Checklist

Real-Time Feature ID #	1345568
Project Phase	☐Sales Process ☒Solution Design ☐Implementation

Functional Resource Checklist

BRD Template Required Sections:
☒ Business Challenge and Stakeholders
☒ Functional Requirements
☒ Proposed Process Description and Configuration
☒ Testing Scenarios and Benchmarks
☒ Recommendations and Considerations
☒ Functional Acceptance

While Revising Document:
☒ Update "Last Modified" date on cover page
☒ Update Table of Contents if needed
☒ Communicate any changes to Team
       ☒ Agree and commit new changes
       ☒ Disagree and further discuss changes
☒ Communicate all changes to Client:
       ☒ Accept all changes
       ☒ Delete all comments

Before Submitting BRD to Developers:
☒ Confirm all sections are complete and correct
☒ Update "Last Modified" date on cover page
☒ Update Version History if changes were added
☒ Schedule Q&A Call with Developer to Follow Up

After Receiving Technical Estimate from Developers:
☐ Review Technical Estimate with Client
☐ Have Client Sign Technical Estimate Acceptance Document

Technical Resource Checklist

Before Submitting for Testing:
☐ Attach Detailed Technical Estimate and Send to Functional Team
☐ Run Customization Analysis Report (CAR) to identify system additions

2 Introduction

2.1 Business Challenge Overview

Long Island Sound Health System (LISHS) is currently using a spreadsheet provided by the CDC to track and manage their PPE inventory for five outpatient sites and twenty-five hospital departments. LISHS is in need of a more efficient and streamlined system that increases the speed of their PPE tracking process, generates burn rate and restock values, while also meeting all of the unique requirements enlisted within this document.

2.2 Stakeholders

Those affected by this new system include: the administrative staff for the outpatient sites, the administrative staff for the hospital departments, the IT analyst who is currently handling PPE data, the IT director who reviews the PPE data, the clinicians and hospital staff utilizing PPE, the patients needing PPE, and the product development team who will help design the new system.

3 Functional Requirements Narrative

LISHS is wanting a system that better manages and distributes PPE equipment items to clinical staff in the 5 outpatient sites and 25 hospital departments. This system will streamline and automate the inventory counts by generating unit measures each time a PPE item is checked out by a staff member, while also calculating the burn rate every week, and the selected software will notify staff once the levels are low so that they can restock items.

3.1 Development Guidelines

In order for the PPE tracking system to work properly, it will abide by each of the requirements enlisted below. If one of these cannot be met, the working group will determine how to proceed.

Req. #	Requirement
1.	**Description:** The new streamlined system must track the inventory of PPE equipment by counting the number of individual units for each item (N95, facemasks, respirators, eye protection gear, gowns, gloves, and ventilators) automatically. The inventory measure for each PPE item will follow units according to box counts. The number of items per each box will distinguish how much PPE is being housed in the system or used by staff.
2.	**Description:** The new system must have a mathematical feature to calculate the burn rate, or rate of consumption, for each of the PPE equipment items. This feature will measure burn rate in terms of units, so according to box counts left for each item after a certain period of time. The burn rate will also include the consumption of PPE by the number of patients being treated and needing PPE for treatment.
3.	**Description:** The new system must include a feature that allows for restock counts to be included when calculating the total units for each PPE equipment item during inventory tracking. Restock counts comprise of additional PPE equipment items or units coming in from back orders.

Req. #	Requirement
4.	**Description:** The new system must allow staff to report PPE inventory unit counts after a determined set of time to departments and third-party organizations via email or shared folder.
5.	**Description:** The new system must include technical abilities to send inventory data to the LISHS Lawson ERP (enterprise resource planning) software platform through a REST API format. The inventory data being retrieved and sent to the ERP system needs to include the current amount of PPE equipment units and requirements for purchasing additional PPE items.
6.	**Description:** The new system must abide by the CDC's capacity guidelines by employing a PPE capacity amount and minimum quantity measures. The deployed system must measure conventional capacity, which outlines the administrative protocols controlling PPE levels for the organization prevention and control plans. The deployed system must measure contingency capacity, which generates a back-up measurement plan that could be used in the event of a temporary PPE shortage. This capacity requirement must be completed after the conventional capacity requirement is established. The deployed system must measure crisis capacity, which is a strategic plan used during times of continuous PPE shortage or when the burn rate is overbearing for the practice. This capacity requirement will be the third line of defense and will only be enacted once the previous capacity requirements have been established.
7.	**Description:** The new system must also be mindful of the practical requirements for clinical staff members and patients being treated at LISHS. The customized system should consider the medical treatments that PPE is being distributed for, periods of PPE equipment influx and rapid burn rate turnaround, protocol requirements for patients, periods of close interaction with patients at risk, the volume of patients versus the volume of treating hospital staff, and general limits for how much PPE is available to sites or departments.
8.	**Description:** The system should be able to document which outpatient sites or hospital departments are using the most PPE equipment. This function will be accomplished by having the staff member checking out PPE equipment provide an ID or user login.

4 Proposed Process

4.1 Proposed Process Description

The formulated solution to resolve the organization's PPE inventory issue will use an established PPE tracking software application published by 3PL Mentor and leveraged by Microsoft. This software application will be downloaded onto designated portable monitors that will be used to track PPE equipment for each hospital floor and each outpatient site.

The software will be running on a portable monitor that is linked to a dispensing system that the product development team will design from scratch. This system will consist of the monitor running the mentioned software, an ID scanner connected by a USB-C cable to document clinical staff checking out PPE equipment, a dispensing unit that will supply N95 and face masks, five drawers that will house PPE gowns of different sizes, and two cabinets stacked on top of one another housing gloves of different sizes and adjustable eye protection gear. A sample image is attached below to display this set up.

The dispensing system paired with the software application leveraged by Microsoft will be housed in separate rooms on each hospital floor and in one room within each outpatient site. Clinical staff will need to scan in their badge to enter the room and check out PPE equipment. Ventilator check-out will be processed separately by the hospital respiratory floor manager in the event that it is requested. Once an agreement is reached and a ventilator is distributed, the clinical staff will scan their ID into the system as usual and the respiratory floor manager will confirm the action by putting in their credentials to document the exchange. For this new distribution system, the clinical staff have a limit of entering the room with their ID twice a day. After that second scan, PPE requests would need to be made to floor managers.

At the end of the week, the IT analyst will receive the combined mean values for the units used, units still available, the burn rate for each PPE item and any restock that has been added. The software will be customized to automatically generate these values. Once combined, the weekly values will be sent to the IT Director who will then forward the value counts to managers, so that they can determine how much PPE they have left, are in need of, and what is needed for reorder.

4.2 Proposed Process Flow Overview
The diagram below describes how PPE will be tracked and managed.
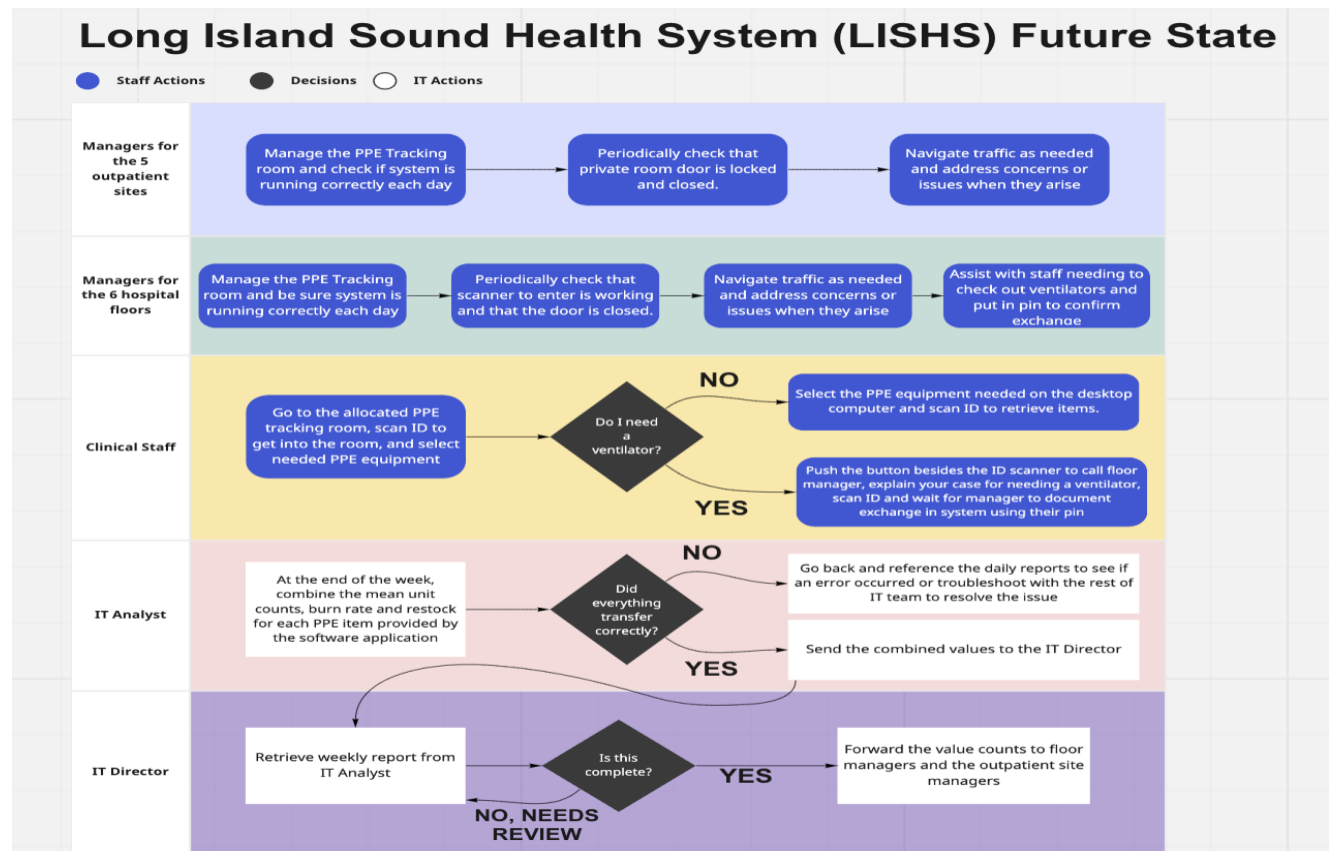
4.3 Setup and Configuration

- Software – related equipment for system
    1. The software used for this new system will be the 3PL Mentor PPE Tracker application that leverages the Microsoft Power Platform.
    2. To better support this application, the organization must have a Dynamics 365 subscription which includes premade packages to solve any issues.
    3. Additionally, the software must be paired with Power Apps, which is a unique product that supports the PPE Tracker application. Power Apps is essentially the link between the 3PL Mentor PPE Tracker and Microsoft 365 products.
        - Power Apps will be the tool that allows for the customizations to be made to meet the requirements for this new system.
- Hardware – related equipment (combined for 6 hospital floors and 5 outpatient sites)
    1. 11 ThinkVision M14 Portable Monitors
    2. 11 ID scanners
    3. 11 USB-C connectors that link ID scanners to monitors
    4. 11 Employee ID card scanners outside of each PPE room
    5. 11 Dispensing machines that will house N95 and face masks
    6. 5 drawers that will house gowns of different sizes (S-XXL)
    7. 2 stacked cabinets that will house packs of gloves in different sizes (S-L) and eye protection gear of universal size
    8. 11 red buttons besides each monitor to signal that a ventilator is needed to a manager

The diagram below describes the cloud architecture for the software-driven system.
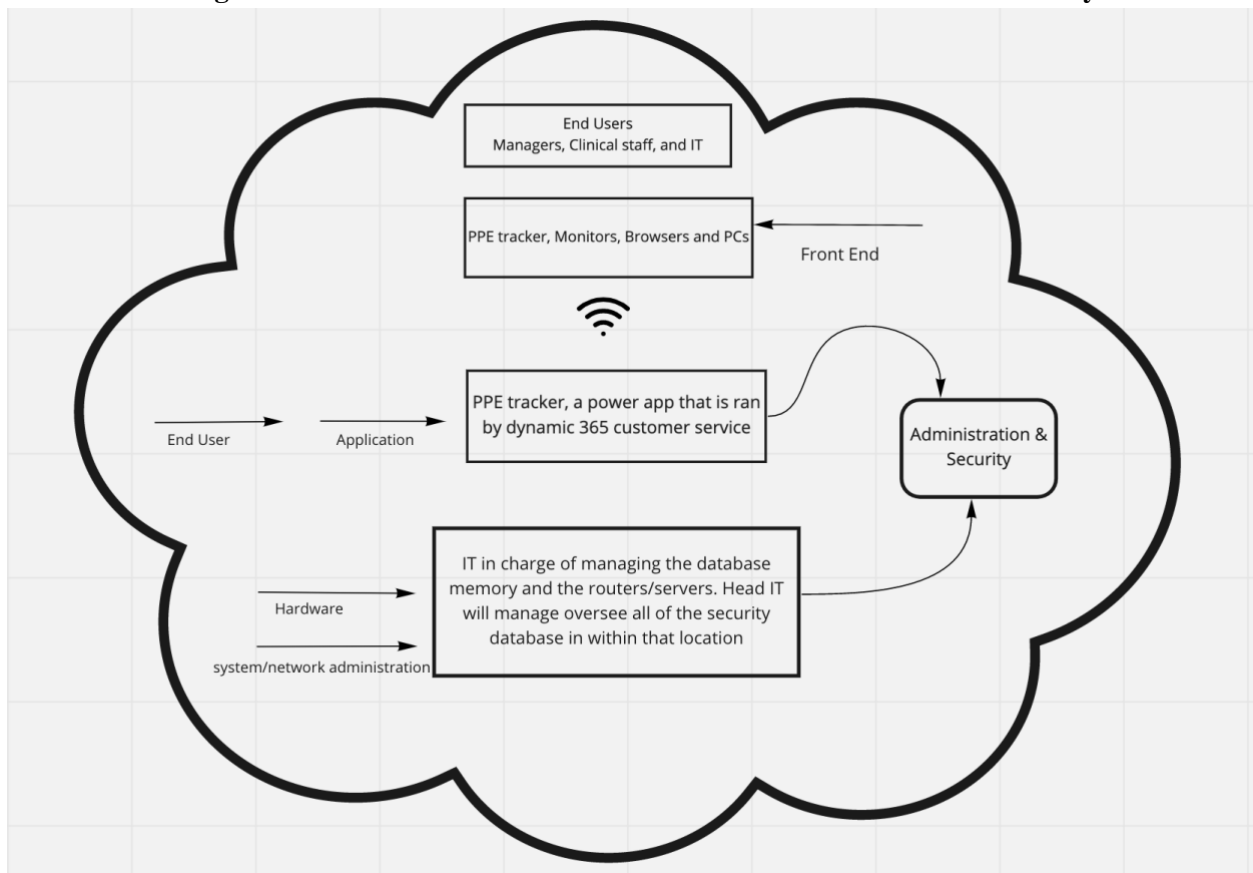
4.4 Usability Requirements

The image below provides a visual depiction of what the new system aims to look like.


1. Intuitive programming and display of PPE options on home screen
2. Large enough font and text sizes for all to clearly read screen content
3. Auto-lock features that unlock the cabinets and drawers once ID is scanned
4. Confirmation page displaying number of PPE items at the end of exchange
5. Screen navigation icons such as "back" and "next buttons"

4.5 Screen Mockup: Step-by-Step Visualization

After scanning in their Employee ID, clinical staff will see this page.
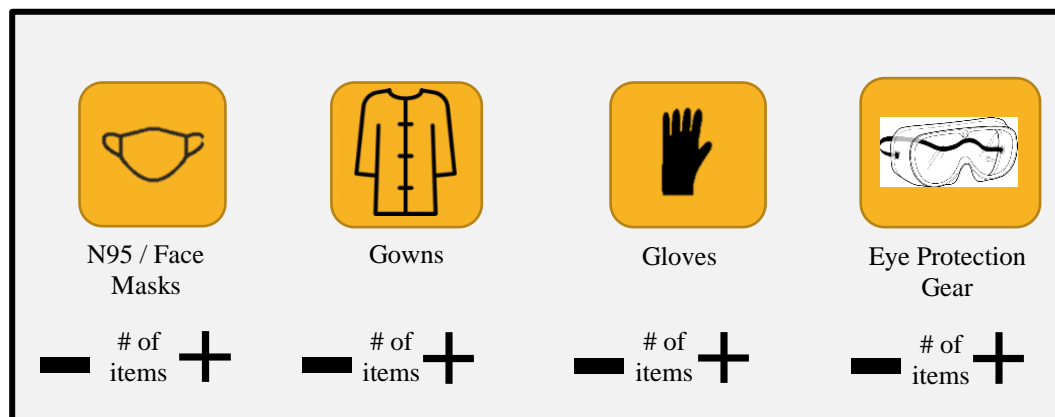
After the identity verification page, this home screen will appear for staff to select PPE.
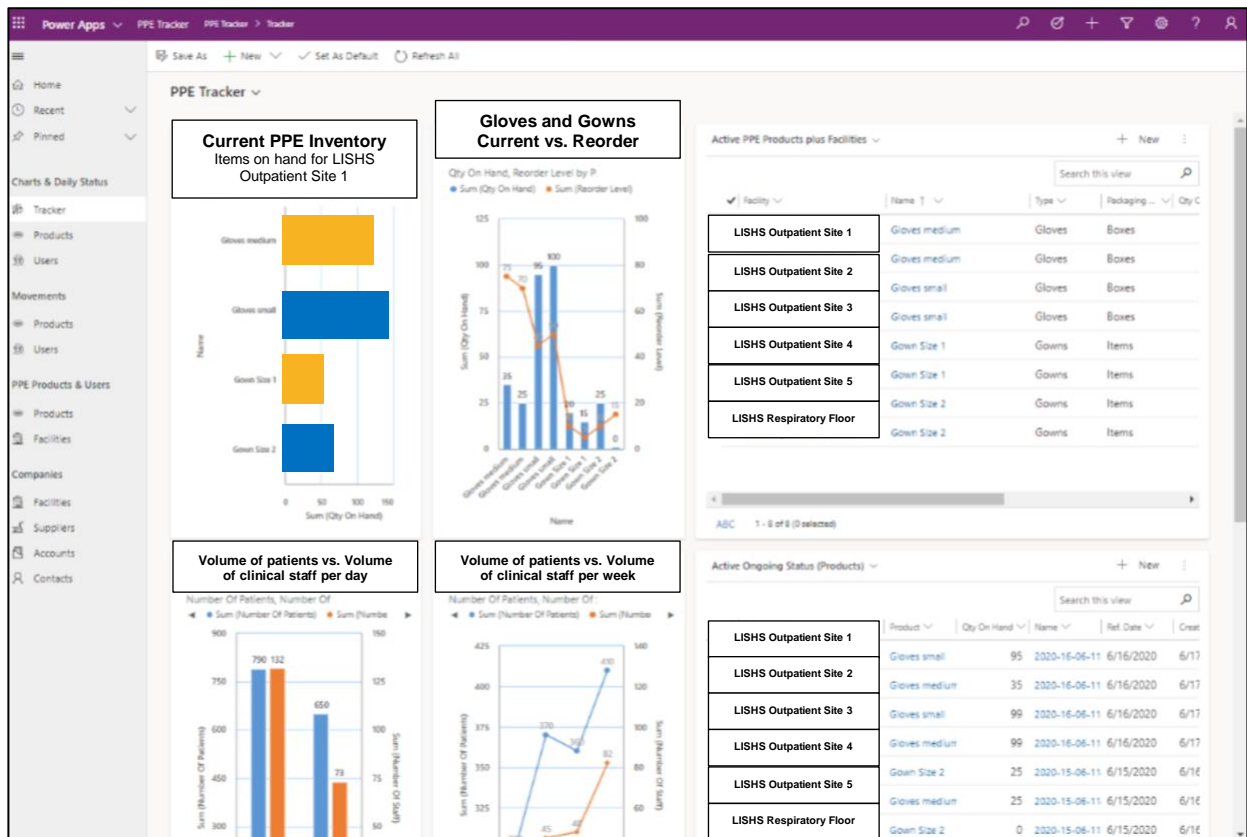
2 N95 Masks

2 Pairs of Medium Gloves

Confirm Selected Items

✓ Confirm   ✗ Deny

This is the final confirmation page that the staff will see before retrieving PPE items.

4.6 Diagrammatic Mockup: Microsoft Software Visualization

This is the home dashboard that the IT Analyst will see at the end of each week.

This dashboard will display overviews for the current number of PPE units, the weekly sums for both current unit counts and reorder unit counts for all PPE items, patient flow visuals and lists of active and ongoing products within the distributing system for all locations.

This is the page that the site and floor managers will see to view employee and patient PPE use.

This page is unique to each location within the LISHS organization and only managers or supporting administrative staff will view this page. The goal of this feature is to control who has access to the PPE room, add new clinical staff members, remove former clinical staff members, and see the ratio between number of patients vs clinical staff to analyze PPE distribution.

This is the page showing the total number of select PPE items in inventory for all facilities.

This page will provide the IT team, floor managers, outpatient site managers and supporting staff with a quick overview of how many PPE items each facility has. The goal is for this to be updated weekly after the report is received by the IT team.

5 Testing Scenarios

- First, the IT team and product development personnel will set up the systems in the designated locations. During this step, both teams will test each piece of equipment including the software and hardware needed for the system to function.

- Once all of the infrastructure components have been set up and tested, the IT department will see if the technical requirements are established and if functionality is efficient within the software application. During this step, the IT team will confirm that all previous inventory counts are accounted for in the new system.

- After the IT team confirms that all data and features are ready to integrate into clinical staff workflow, a technical dress rehearsal will take place. A selected working group composed of clinical staff, a site manager, a floor manager and the IT team will be testing the system for a week in one outpatient site and one hospital floor. The goal is to test and identify issues or concerns with the system before a full rollout to the entire organization.

- Following the technical dress rehearsal, the IT team will meet with the working group and product development team to address concerns or issues that are needing to be fixed. The result of this meeting will determine the GO-Live date and method of integration for each facility.

5.1 Dependencies and Constraints

- Training needs to be completed well
- All staff must reach a clear understanding on how to use and navigate the new system
- All staff needs to be comfortable with the system before it is integrated into clinical workflow
- Staff needs to report issues to floor managers for IT assistance the moment that they occur to reach resolutions in a timely manner
- All current inventory counts need to be manually inserted into the new system before Go-Live takes place
- It is important to confirm that the Microsoft application works, does what is needing to be done, and be sure it is practical amid a clinical workflow
- It is important that those managing the system are conscious of there being enough hardware and systems in place at all times
- Contingency plans must be in place with additional system hardware items and backup networking functions in case the system temporarily fails
- A backout plan must be in place in case the system does not work as it was meant to or is not functional within a clinical workflow as expected
- It is important to note the technical and network state of hospital floors and outpatient sites before Go-Live
- One room must be available in each outpatient site and there needs to be space available within each hospital floor for new system
- IT maintaining system and troubleshooting issues
- Budget

5.2 Testing Assumptions

- Before Go-Live, LISHS and the product development team will set up the physical distributing system in the designated locations for all facilities.
- Before Go-Live, the IT department will download the PPE tracker application onto each portable monitor linked to the physical distributing system.
- Before Go-Live, LISHS will test all of the technical and functional components described in this document and communicate with the product development team or Microsoft Customer Service for assistance.
- The IT department manually entered in the current PPE values and components from the CDC spreadsheet into the new tracking system.
- The IT department retrieved the names of clinical staff and personnel needing access to PPE equipment and created accounts for them within the PPE Tracker software application.
- The IT department must ensure that inventory data collected within this system can be sent to the LISHS Lawson ERP system via a REST API framework.
- The IT department must test that inventory counts, burn rate, and restock values can be sent within the LISHS network to staff members via email or fax if needed.
- Lastly, approval of this BRD was obtained after the technical estimate and product design was discussed. Once approval has been received, the testing process will begin.

5.3 Security Issues

- Those managing the system must ensure that only clinical staff from the LISHS hospital departments and outpatient sites are able to access the PPE system.
- Those managing the room where the system will be housed in must ensure that the door is closed and that the machine is functioning correctly throughout the day.
- Those managing the system must ensure that no one is stealing PPE equipment.
- Those managing the room must ensure that PPE equipment is housed securely.
- It is important that only a select few know where the rest of the PPE equipment and back orders are housed.
- Lastly, it is important for the IT team to regularly check the list of system users and ensure that they are all still employed by the organization.

5.4 Performance Benchmarks (system availability, performance testing)

- **Technical Dress Rehearsal Benchmarks**
  - ✓ Successfully scan at least 20 staff members into the PPE room
  - ✓ Successfully process a minimum of 50 PPE transactions
  - ✓ Successfully link at least 50 PPE transactions to the correct system user
  - ✓ Successfully document the current PPE inventory counts for one site
  - ✓ Successfully document the burn rate for all PPE items for one site
  - ✓ Successfully account for restock or additions to PPE items for one site
  - ✓ Successfully retrieve all inventory data for each PPE item for one site
  - ✓ Successfully send all inventory data to a single user

- **Go-Live Benchmarks**
  - ✓ Successfully set the software account to the correct facility
  - ✓ Successfully scan in all clinical staff and personnel into the PPE room
  - ✓ Successfully process PPE transactions during hours of operation
  - ✓ Successfully link all PPE transactions to correct user requesting PPE items
  - ✓ Successfully alert the user that they have reached their limit for the day, if the registered staff member has scanned in their ID more than two times.
  - ✓ Successfully document the daily inventory levels for the selected facility (this is a benchmark for all facilities to pass individually)
  - ✓ Successfully document the daily burn rate values for the selected facility (this is a benchmark for all facilities to pass individually)
  - ✓ Successfully document the restock values for the selected facility (this is a benchmark for all facilities to pass individually)
  - ✓ Successfully document the combined weekly data for each facility (this is a benchmark for the IT analyst to pass)
  - ✓ Successfully send the combined weekly data for each facility to the IT director (this is a benchmark for the IT analyst to pass)
  - ✓ Successfully send the combined weekly data for each facility to the assigned floor and site managers to analyze PPE value counts (this is a benchmark for the IT director to pass)

6 Best Practice Recommendations

- For a smooth Go-Live, it is recommended that LISHS train each hospital department and outpatient site separately to confirm understanding of the new system.
- For a smooth rollout process, it is recommended that LISHS perform a well-planned and structured technical dress rehearsal or pivot test before proceeding with implementation of the new system.
- For a better experience, the PPE room should remain clean and traffic should be managed by the manager for that site or department.
- For efficient data exchange, it is recommended that LISHS utilize Microsoft products (Word, Excel, Access…) for easier data export and sharing via email.
- For efficient data exchange, be sure that all fields are readable and organized in a way that can be easily navigated and explained to others outside of the organization.

6.1 Considerations

- The group running the current CDC spreadsheet will develop this BRD as a team and meet regularly to confirm new additions.
- Select facilities will be selected for initial testing of the concepts in this BRD.
- A digital environment will exist for publication and reference of this BRD upon satisfaction of all requirements.
- LISHS will test and confirm the functional components according to requirements.
- LISHS will test and confirm that reporting function according to requirements.

7 Version History and Deliverable Acceptance

The following chart is used to capture the history of revisions that have been made to this document. Each time the document is revised, the person responsible for making the revisions is expected to update this chart.

Version	Date	Author	Description	Approved by Client
1.1	11/12/2021	Victoria Rodriguez	Initial Draft	-
1.2	11/18/2021	Victoria Rodriguez	Completed Sections 1- 4	-
1.3	11/22/2021	Victoria Rodriguez	Revised swim lane attachments, project assumptions, and completed the rest of the sections	-
1.4	11/23/2021	Victoria Rodriguez	Checked for grammatical errors, finalized some loose points, and confirmed with the team that all items were included.	✓

7.1 Document Acceptance

After review of this document, we approve this current functional design version to undergo a technical estimate.

1. The Client will sign once they complete their review of the functional design.
2. Any design changes as a result of the technical estimate will require a new revision update to the document and client approval.
3. After the technical estimate is completed based on the requirements outlined within this document, the estimate will be presented for acceptance and signoff by the client.

Client Name:	Long Island Sound Health System
Prepared By:	HHA 502 – Group 7
Version:	1.4
Date:	11/23/2021

ACCEPTED BY: _____   Date: _____

REJECTED BY: _____   Date: _____

REASON FOR REJECTION:

COMMENTS: