NW BYOTEK Facility Management System
System Demo Document

by Triton Consulting Group

Monday, May 29, 2023

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Section 1: Management Summary

As we approach the two-month mark on this project, we are now planning to move onto the rollout plan where we go live with the system through a piloted cutover method and will begin training as well. So far, we have completed multiple aspects of system development such as user interface design, mockups, the database, and system architecture for the design phase. We've also made major progress in the implementation phase when it comes to coding, outlining the testing plan, carrying out said plan and as previously mentioned the rollout plan that covers going live, training, and further beyond is set to go forward next week. Documentation will cover all our progress until we have completed system development. Finally, when it comes to our costs, the good news is that we haven't gone over budget and our choice of piloted cutover for the rollout plan will make sure we don't end up spending more than we can afford even with the recent spikes we've had to pay for correcting some errors.

Here is a brief review of the many system benefits that are possible thanks to all the work the team has put into this project.

- The updated database capabilities will help keep track of employee and chemical information, easier to find at any time now
- Updated security system so you can watch live feed of the cameras in the laboratories
- Easier to keep track of chemical supplies in real time and order more to restock when needed, as well as information about chemicals also being displayed
- Report generator helps offload the amount of work needed for computer/paperwork
- Alerts are immediate and easy to understand so problems are solved faster

We have devised a system implementation schedule in which the system will be fully installed across the NW-BYOTEK facility after testing and the test documentation is finished. If the implementation goes smoothly and there's no major problems, we should be done within a couple of weeks starting on June 2nd and ending on the 16th. With all of this in mind there are still some snags we've run into over development such as user testing not quite going to plan, issues with security like cameras sometimes going down, how the system is scaled, and lack of diverse features.

Section 2: Rollout Plan Summary

The Rollout Plan provides a comprehensive overview of the essential steps involved in successfully launching NW-BYOTEK's Facility Management System. This section encompasses three crucial phases: installation, release, and post-release. Additionally, a pilot program is introduced as a preliminary step before initiating staff onboarding and user training.

2.1 Implementation Activities

Installation

The NW-BYOTEK facility will adopt the same versions of the software across all computer workstations to guarantee compatibility and uniformity. User access controls will be set up to limit system functionality in accordance with the individual's role as opposed to the device they are using, granting access to certain features when necessary.

Furthermore, portable versions of the app will be installed on handheld barcode scanners, enabling convenient and mobile access to the system's features and capabilities.

Go-Live

During the release or go-live phase, our primary focus will be on ensuring that users are adequately trained, all chemical location data is accurate, and any potential errors or issues are quickly addressed to establish a smooth rollout.

User Training: Our experienced staff will conduct training according to our comprehensive training plan. Employees will get instruction and practical experience in accordance with the training plan to help them develop the knowledge and abilities required to use the new system properly.

Data quality: Accurate data needs to be migrated into the new system in order to maintain its integrity and reliability. All data will be carefully retrieved, converted, and loaded into the new system from the current system. Validation processes will then be executed to ensure that all data loaded into the system is completely accurate.

User Acceptance Testing (UAT): Before the system is fully released, User Acceptance Testing is essential in order to identify any issues. Users will simulate real work situations and evaluate the system's functionality. Users will then provide feedback on the system, reports, and issues they encountered, and suggest improvements.

After Go-Live

The post-release phase of system implementation is crucial for maintaining optimal system performance and guaranteeing that the system sees consistent improvements. To ensure this the following actions will be taken:

System Performance Monitoring: Our team will continue to diligently monitor the performance and reliability of the system to identify any potential issues or bottlenecks. Regular system audits and reviews will be conducted to assess the system's overall health and to ensure that the system adheres to our team's high standards. Response times, resource

use, and general system stability are the key performance measures that our team will be actively monitoring.

User Feedback: Stakeholder feedback, difficulties, and suggestions for the system will be collected and evaluated to enhance system functionality. This feedback will be collected through numerous methods, such as through user interviews, surveys, and support tickets.

Continuous Improvement: We are dedicated to providing a dependable and accessible inventory management system beyond initial implementation. Regular updates, bug fixes, and the addition of new features will be delivered to ensure consistent system performance and to meet changing stakeholder needs. Based on user feedback, our development team will give priority to adding improvements and new features that complement the objectives and needs of the business with the least disturbance to the storage facility and research labs operations.

2.2 Rollout/System Changeover Method

By adopting the piloted cutover approach, our team aims to maximize the effectiveness of our systems implementation. Managers and leads from each department will be responsible for testing each component of the system and ensuring that the product meets requirements. All members of the pilot program must reach unanimous approval before NW-BYOTEK can begin training regular staff. All issues that are not resolved during this phase will be their responsibility to address later, which could be more difficult and consequential under normal operations.

Section 3: UI & Database Prototype SOW

3.1 Purpose

The purpose of the prototype is to create an example of the new system that will be tested and evaluated in the preliminary stages of the design phase. It enables NW-BYOTEK to approve system design concepts, identify errors, and discover missing functionality before implementing the system. Prototyping also increases user involvement and feedback ensuring that the final system meets the stakeholder’s requirements.

By detecting defects and missing functionality early in the prototyping stage, issues can be addressed before the system is fully implemented. This ensures stakeholders' satisfaction, and reduces time and costs, which leads to successful outcomes.

3.2 Type

We selected throwaway prototyping, which involves creating a quick design for stakeholder review. This allows for early feedback from users while minimizing the cost of trial and error.

We chose this type because we had gathered all the requirements and had a clear idea of what functionalities and design the new system would need.

3.3 Approach

We used the throwaway approach which served as a rough draft of the system that helps gather feedback and refine requirements. Through storyboarding, we developed visual mockups of the system's GUI and the various reports requested by NW-BYOTEK. We used Microsoft Access to create the database. In addition, we created a data dictionary, a network model, and a process diagram to provide further context.

3.4 Process

During the prototype process, we started by using storyboarding to create all screens the users will interact with in the new system. When the prototype was ready to be tested, we performed user testing and collected feedback. Based on the feedback received, we implemented the necessary adjustments to the prototype. Once the required refinements were made, we conducted further testing to ensure that the system fulfilled all the specified requirements.

Section 4: Technical Review of UI & Database Prototype

4.1 UI and Database Prototype Tools and Technology

Due to Microsoft Access's many benefits, it served as the database management system in our prototype. Access was selected primarily for its ability to provide simple and effective data entry and retrieval. Another important consideration in selecting Access was how quickly it allowed our team to create the overall database structure.

Our team utilized Pencil Project for the initial User Interface design. The user-friendly interface and ease of use of this program allowed our team to swiftly conceptualize and visualize the elements of the User Interface.

Following the design phase for the User Interface, the prototype was made into a working application using the .NET framework. Our team chose to build the prototype using .NET as it provided our team with a very comprehensive set of libraries, tools, and features to develop the prototype into a very feature-rich application.

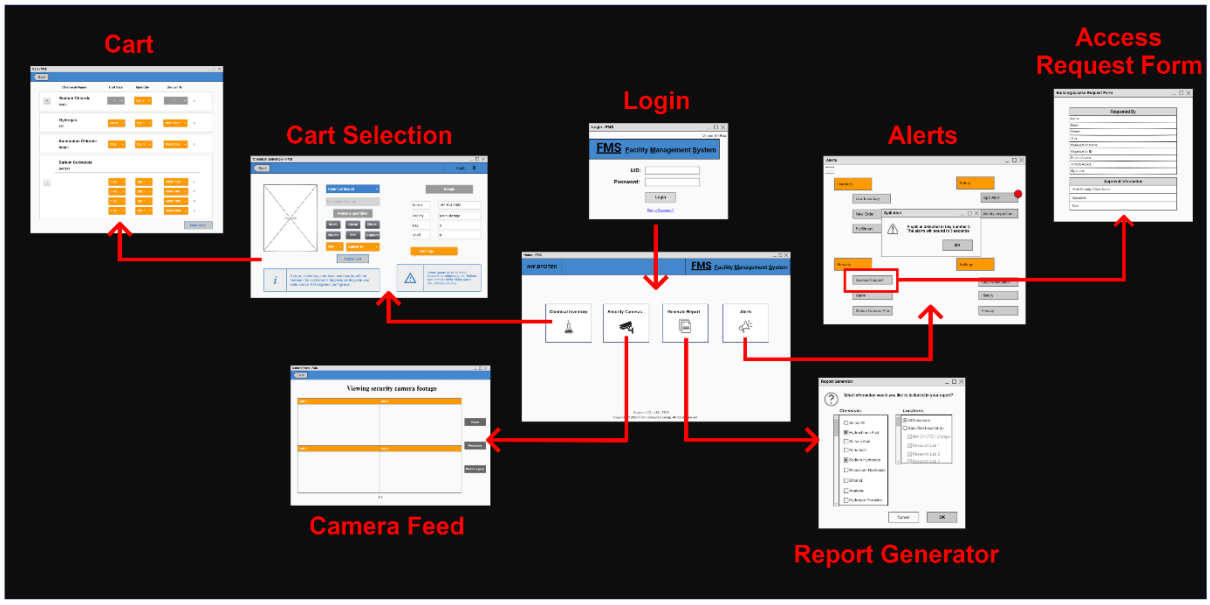
4.2 Project Tools and Technology

The project will utilize the same tools and technology used for the prototype application for a myriad of reasons:

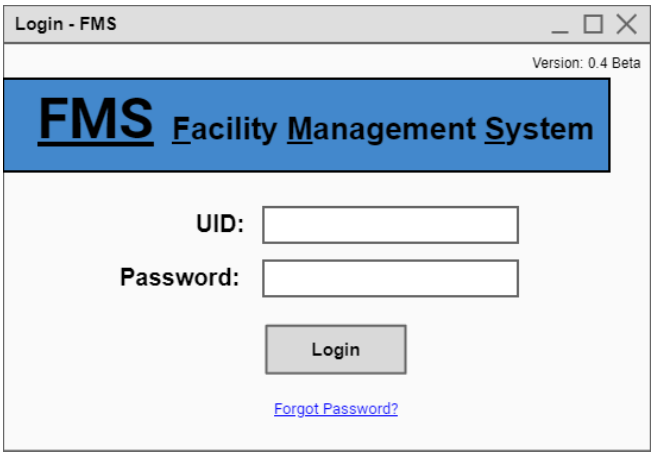
- By continuing to use the .NET framework and Access, the project will be able to utilize the existing codebase and development practices used during development of the prototype.
- Familiarity with the .NET framework will contribute to a smooth implementation of the final system.
- Access allows for very rapid development due to its intuitive features and user-friendly interface.
- Access is an incredibly cost-effective solution as it eliminates the need for additional licensing costs.
- Access integrates very well with any other Microsoft office applications that are being used by the organization.

In summary, the advantages of code reuse, familiarity, cost effectiveness, smooth integration, and quick development are what motivate our team's choice to employ the same tools and technologies, specifically the .NET framework and Access, for the execution of the final project.

Section 5: UI & Database Demo

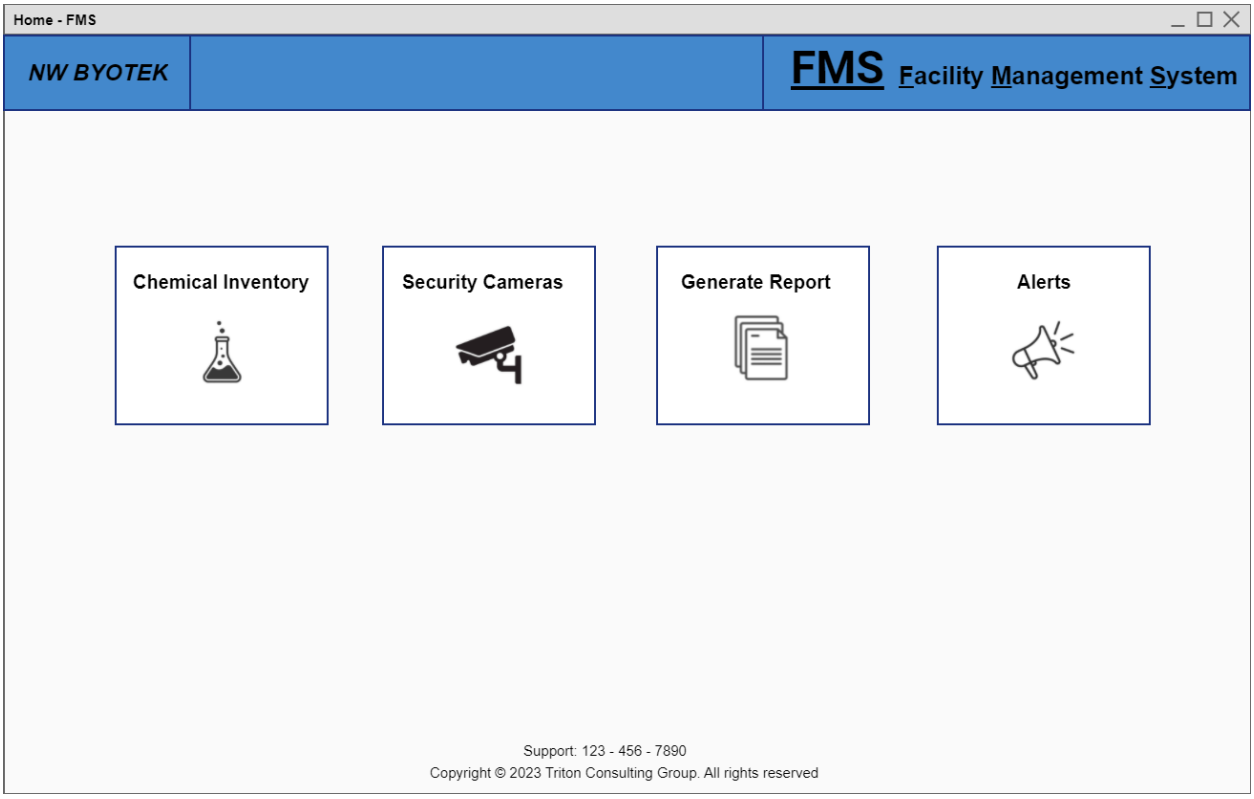


5.1 Login



Upon launch, the user enters their login credentials. FMS first authenticates the user and then loads their user access properties. The user access properties determine which components of the system the user has access to.

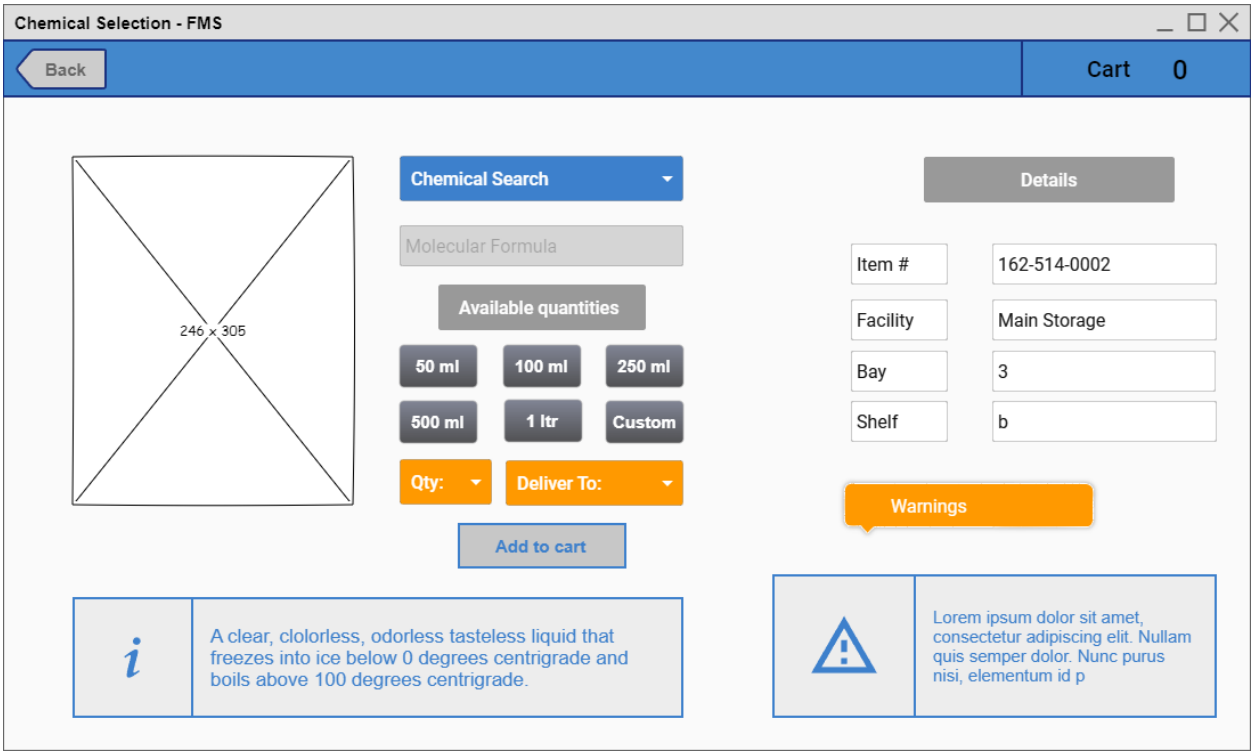
5.2 Home Page



The Home page serves as the gateway to all other UI screens, which includes Chemical Inventory (5.3 & 5.4), Security Cameras (5.5), Report Generator (5.7), and Alerts page (5.6).

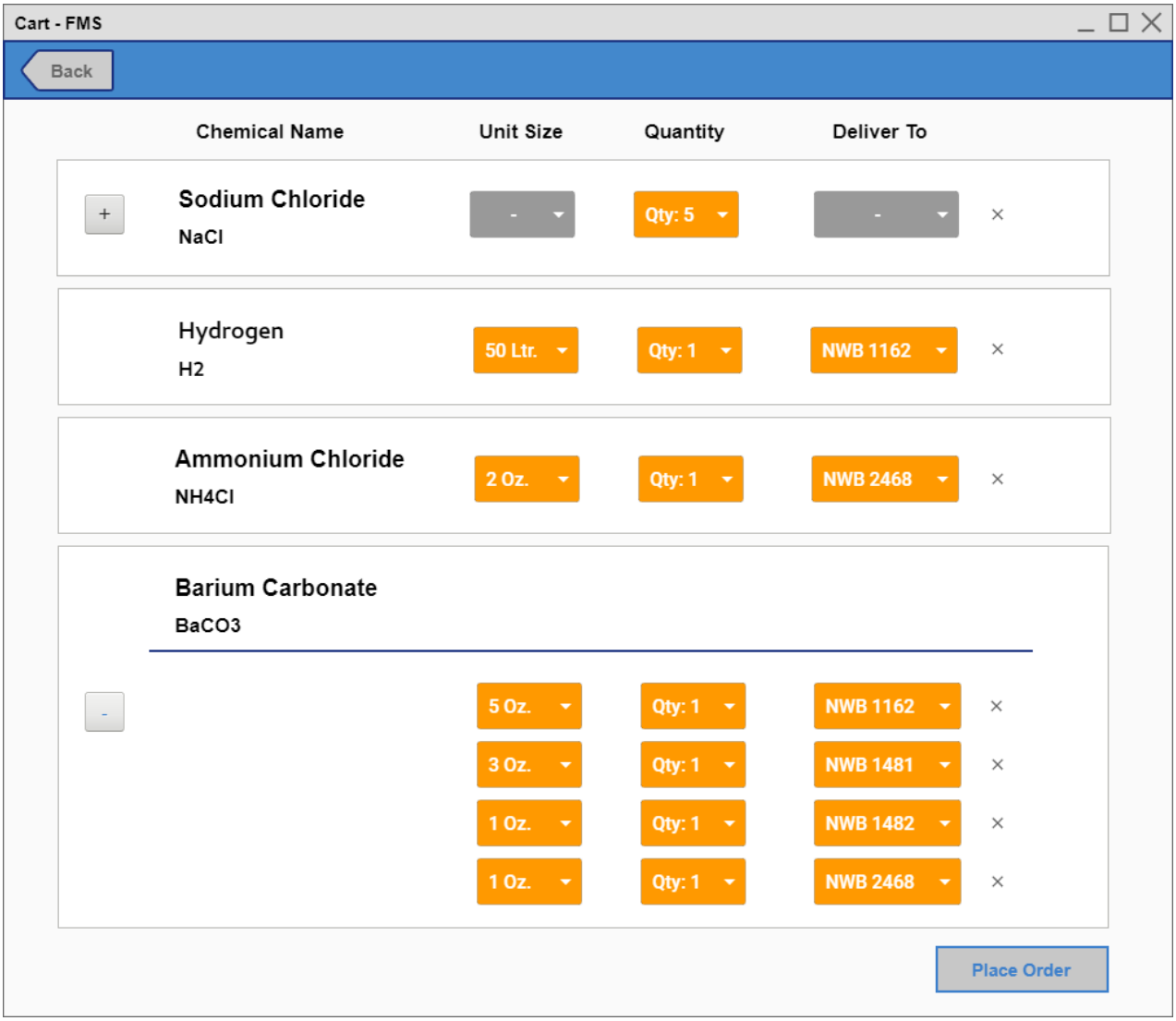
- The *chemical inventory* page may be accessed by lab technicians, lead scientists, and principal investigators.
- The *security camera feed* may be accessed by security personnel, and the Chief Security Officer (only during normal business hours).
- The *report generator* may be accessed by the CSO, CFO, and admin staff.
- The *Alerts* page may be accessed by the CSO, security personnel, and lead scientists.

5.3 Chemical Selection Page



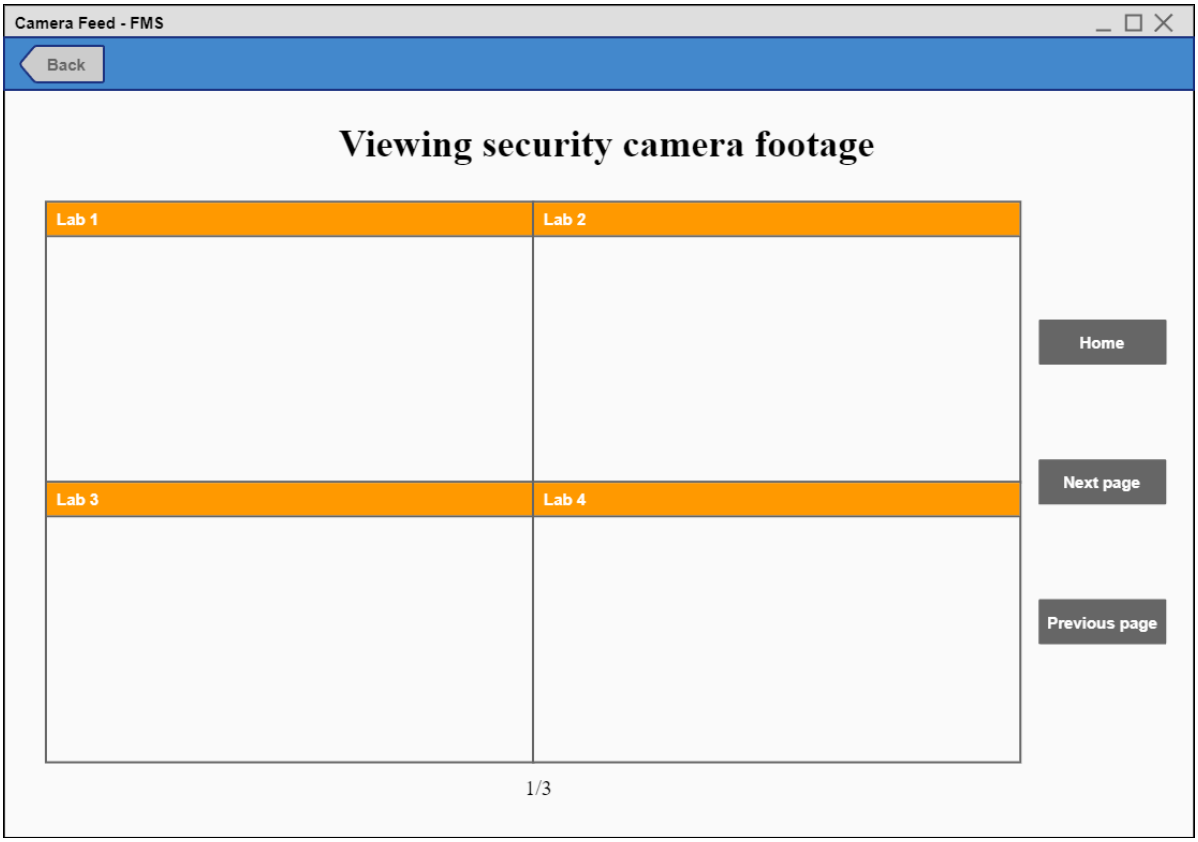
The Chemical Selection page allows principal investigators and lead scientists to browse the range of available items in NW BYOTEKs inventory and view available quantity amounts. These quantity amounts may be requested in multiples (for example, a request for two 5 oz. containers of Barium Carbonate, as well as a single 1 oz. container, all belonging to the same order, but to be delivered to different labs). This page also displays molecular formulas, storage location data, and handling/usage warnings. The user may proceed to the Cart page by clicking the cart button in the top right corner.

5.4 Cart Page



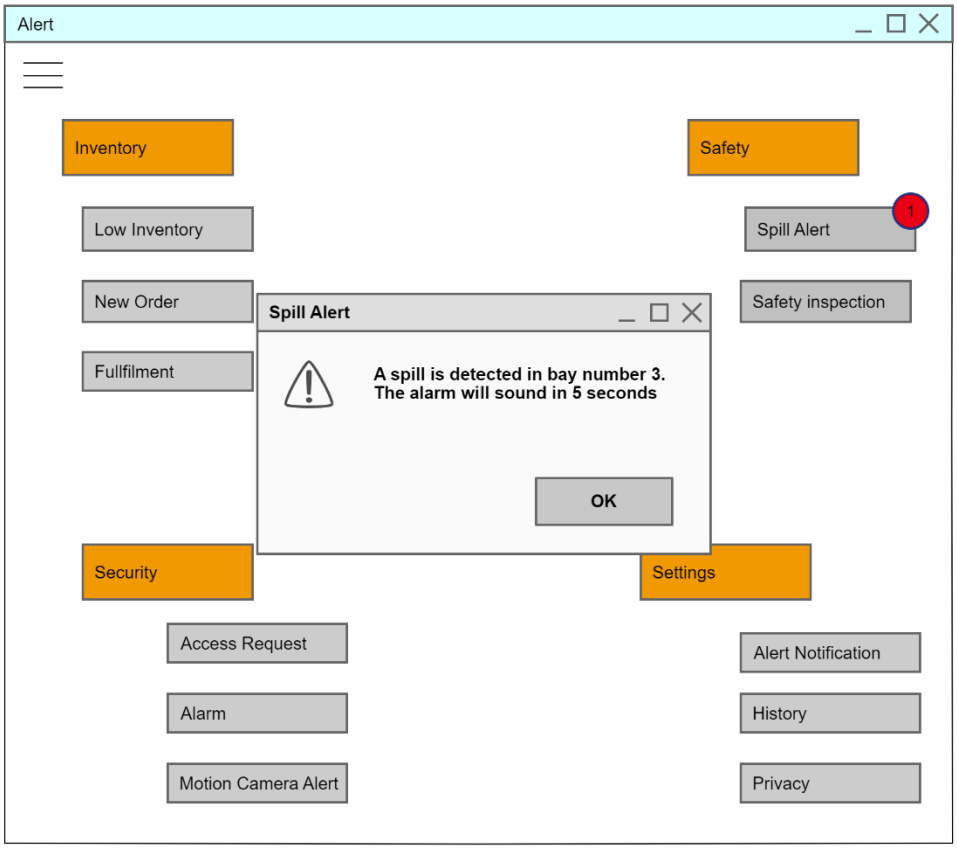
After selecting the chemicals needed on the previous page (5.3) we can see the full list of chemicals in the cart and verify it before placing the order. During the order fulfilment process, lab technicians will group items (regardless of order #) by lab # and then make the deliveries for that specific lab. This will reduce foot traffic and ensure that deliveries are made as efficiently as possible.

5.5 Security Camera Feed



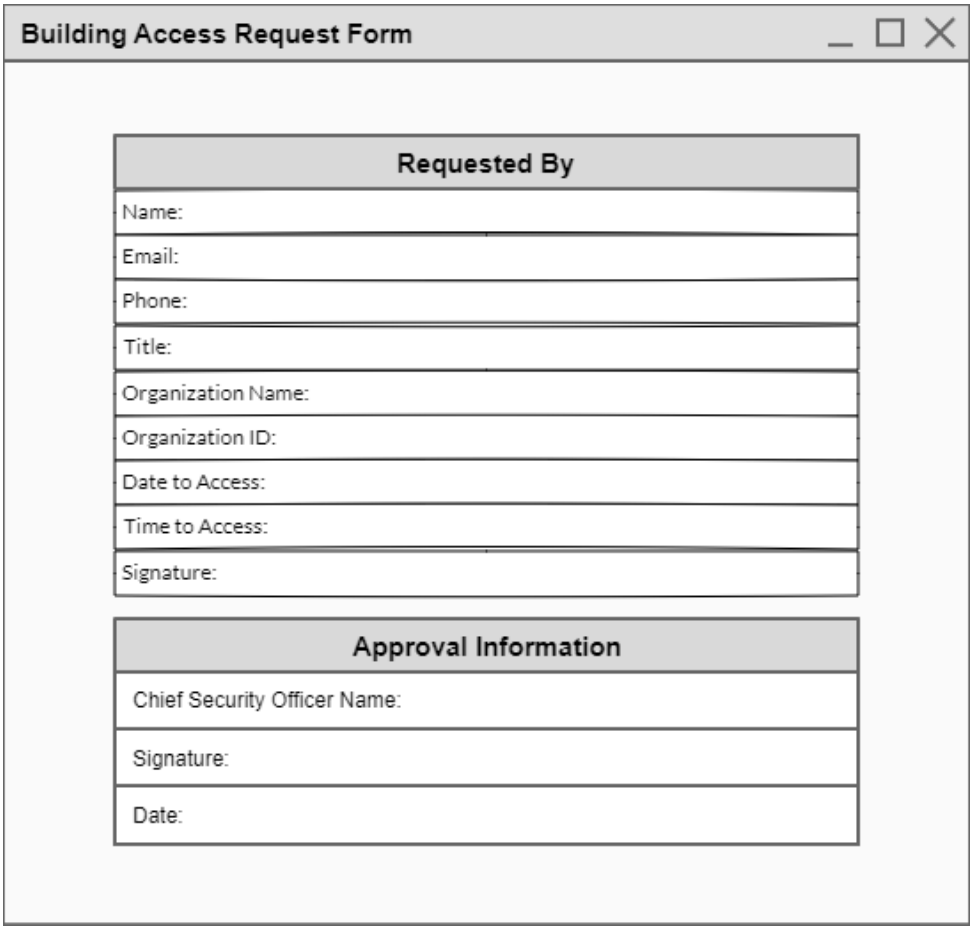
The security camera feed displays four different livestreams at once with three subpages in total amounting to the twelve cameras we have set up in the laboratories. The user may click on a specific camera feed to make it full screen if needed.

5.6 Alert Page



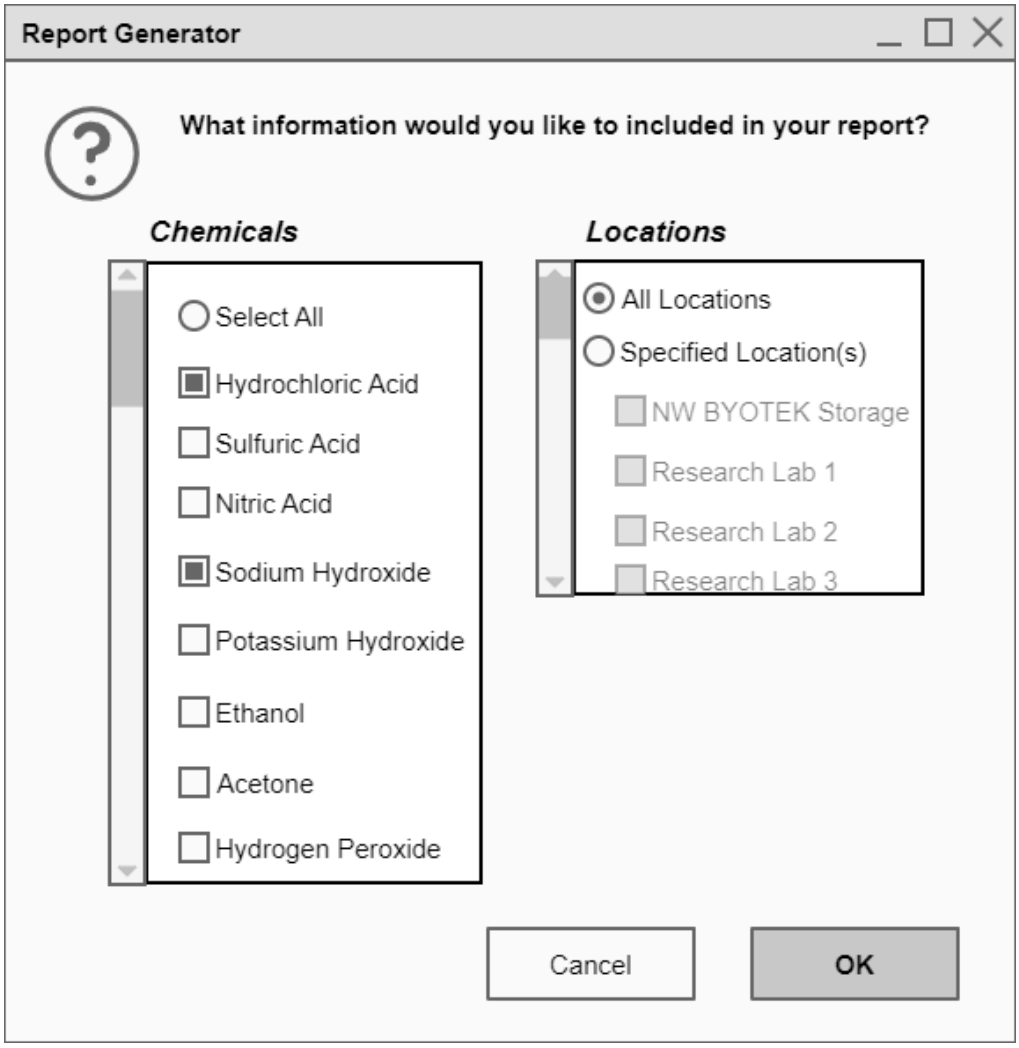
The Alert icon on the home page will display a red circle with a number inside that indicates that there are Alerts that need the users' attention. Once they click on it, the next page displays a pop-up message with the type of Alert based on the account logged in. For instance, the chief security officer will only see alerts related to security and the researchers will only see Alerts related to inventory. An alert notification will be sent to the facility officer's mobile phone and the fire department for immediate attention.

5.7 Access Request Form



For lab techs to enter the chemical storage facility, their request for materials must first be approved. Once approval is given, the lab tech will be issued a pass which opens the keyless smart electronic lock.

5.8 Report Generator



The Report Generator allows users to make customizable reports which contain information on chemical inventories throughout the NW BYOTEK facility.

5.9 Reports

Chemical Inventory: Storage Facility

formula	Unit Quantity	On-Hand Quantity
(CH3)2C6H4	10 ml	500
C5H12	10 ml	425
C6H12	10 ml	35
C6H6	10 ml	753
CH3	10 ml	653
H2SO4	10 ml	4532
HCl	10 ml	45
Hg	10 ml	4532
HNO3	10 ml	10000
NaOH	10 ml	10000
Pb	5 grams	10000

The ‘Chemical Inventory: Storage Facility’ report displays a list of all chemicals that are currently being held in the storage facility. For simplicity, we have shown all chemicals stored in 10ml containers, however, each chemical may be stored in various container sizes (i.e., CH3 could be stored in both 10ml and 20ml containers).

Chemical Inventory: Labs

Lab	formula	On-Hand Quantity
Lab 1		
	(CH3)2C6H4	3
	CH3	5
	Pb	25
	C6H6	10
	C5H12	20
Lab 2		
	HNO3	4
	C5H12	13
	NaOH	10
Lab 3		
	(CH3)2C6H4	2
	C6H12	4
	CH3	40

The ‘Chemical Inventory: Labs’ report displays a list of all chemicals stored in each of the labs, grouped by lab #.

Low Inventory: Storage Facility

formula	Unit Quantity	On-Hand Quantity
C6H12	10 ml	35
HCl	10 ml	45

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The ‘Low Inventory: Storage Facility’ report displays a list of all chemicals with an On-Hand Quantity of less than 100 items. Its purpose is to maintain awareness of items that will need to be re-ordered from vendors soon.

Low Inventory: Labs

Lab	formula	On-Hand Quantity
Lab 1		
	(CH3)2C6H4	3
	CH3	5
Lab 2		
	HNO3	4
Lab 3		
	(CH3)2C6H4	2
	C6H12	4

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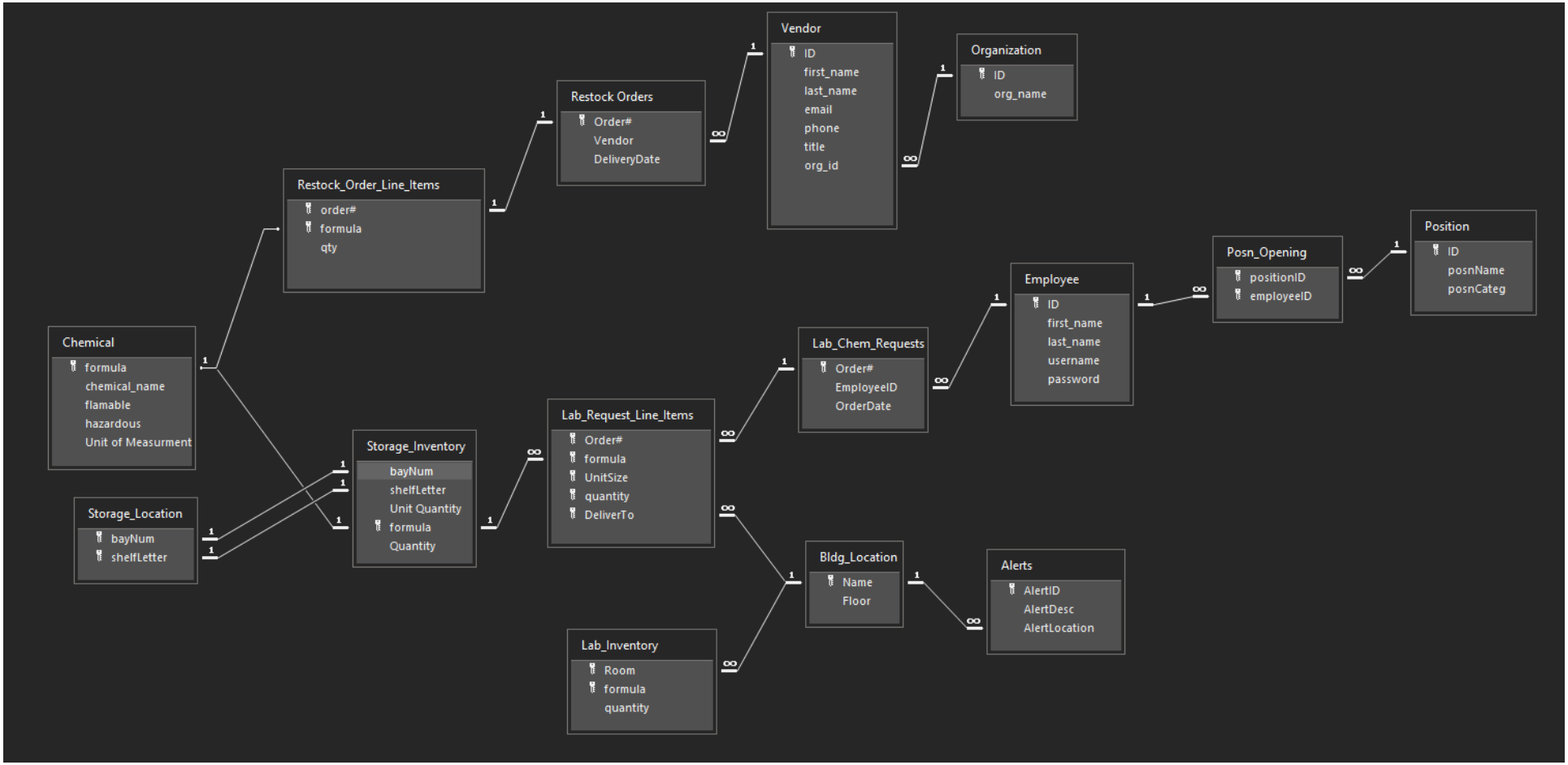
The ‘Low Inventory: Labs’ report displays a list of all chemicals with an On-Hand Quantity of 5 or fewer units, as it pertains to each of the labs. This will help lab researchers keep track of which items they should request from the main inventory. This will help lab researchers keep track of which items they should request from the main inventory.

5.10 Database Design



Section 6: Team Observations on the Prototype

What worked

- The team agreed and used the same tools to develop the user interface and the database.
- The team kept the prototype simple and straightforward. That avoided unnecessary details that do not contribute to the validation process.
- Excellent communication and collaboration among the team members and with the stakeholders. That ensured everyone is aligned with the prototype objectives and reduced the chances of misunderstanding.
- We received positive feedback from the users which resulted in only minor adjustments to the prototype.

What didn't work

- User testing was less comprehensive than we would have liked, while our team received a substantial amount of positive feedback, there was less constructive criticism than we would have preferred. To combat this, we will be gathering a more diverse group of users for any future testing.
- Inadequate scalability considerations, while the prototype has integrated well with certain on-site alerts systems, our team has worries that any new security implemented in the future may not integrate seamlessly with the current prototype.
- Insufficient suggestions from stakeholders, while communication with stakeholders was generally positive, our team feels that the prototype development may have suffered from a lack of diverse feature suggestions from stakeholders.

What we learned

We learned that communication and collaboration among the team members are the basis of a successful prototype.

We also learned that a prototype cannot be done at the first attempt, and modifications are necessary along the way to refine the proposed solutions.

Our prototype allowed us to evaluate the usability and user experience of the NW-BYOTEK system.

Section 7: Next Steps

Prototype Refinements: We will be implementing adjustments and refinements to improve the prototype, based on the feedback received during the prototype testing. This includes addressing any identified errors and defects, adding any functionality that is missing, and improving the user interface based on user feedback.

Wider User Acceptance Testing: Conduct user acceptance testing (UAT) with a wider group of stakeholders, including representatives from NW-BYOTEK, to assess the improved prototype. This feedback will be used to gauge whether our team is ready to develop the final version of the project based on the new and improved prototype.

Construction of the Final System: Utilize the existing codebase and development practices used for the development of the system prototype to construct the final system. Like the prototype, the final system will be developed using the .NET framework and Microsoft Access.

Continuous Improvement: Through the development of the final project, our team will continue to identify areas in the system for improvement. Valuable stakeholder suggestions will be incorporated, and any identified issues will be addressed to continuously enhance the system's usability and functionality.