Warehouse Management System

PennWest California

User Manual

CSC 4900 – Senior Project 1

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Project Overview and Application

This project is a warehouse management system which can create efficient, organized, and responsive warehouse operations by using applications like bootstrap, Apache, docker, Visual studio code, PHP, MySQL and JavaScript. Our project is a web application that uses MySQL as our database, to then break it into rows and columns for easy data retrieval and storage. PHP is the main programming language that allows for same file HTML, PHP, and JavaScript coding. This means PHP can generate dynamic page content, its efficient at creating, reading, updating and deleting data and can interact with our database to store, retrieve and manage data within our database based on user input. This helps optimize processes like inventory tracking, order fulfillment, space utilization and shipment management.

By maintaining real-time records and automating repetitive tasks, reducing errors will enhance overall warehouse performance. This will ensure that companies can manage their supply chains more effectively and stay competitive in the market. The project will utilize Bootstrap as the front-end framework to build a responsive interface, AJAX and JavaScript will be used to improve user interaction, Apache will be used for our bridge between our web application and the internet as our web server and Docker will provide us a container to run all our applications in one place to be able to interact with each other. For our simplified management, a streamlined warehouse operation was implemented, introducing role-based access to ensure data integrity and secure management of products.

Our applicant will be able to handle automating inventory updates, stock management, and reporting. Along with being able to handle its products with the inclusion of QR and Barcode scanning for easy product management and auditing. How users will interact with our system is

through various pages on our dashboard, consisting of storage and products, orders, inventory, vendors, customers, returns, users and roles.

Motivation:

The design and overall structure of our web application is to make people's lives easier in the warehouse management space along with there is a big market for the system we developed. When discussing our design, we wanted to help warehouse managers efficiently track and manage their inventory; this includes ongoing shipments, deliveries, and supplies within the warehouse. While existing systems are available, they are not as affordable or rely on manual or outdated systems to track stock, leading to inefficiencies, errors, and increased operational costs. The team aimed to make a warehouse management system to simplify inventory tracking and management.

The main aspiration when designing our application was to focus on user-friendliness, compatibility, and practical use by warehouse managers and workers as most warehouse managers lack these functionalities that we provide. This includes a responsive design for warehouse managers and workers to minimize the learning curve to use our system. Our system includes QR and Barcode scanning for easy product management and for viewing within the warehouse. Overall, the team wanted to construct a cool and effective system for others to use.

Comparison to existing similar products:

There are quite a few warehouse management systems out there in the world, each of them having strengths and weaknesses. Fishbowl Warehouse is a WMS that provides functionality like SMB-friendly inventory management, automated reorder points, barcode scanning and tracking and multi-location inventory management. In our system we integrate a lot of the functionality that is other system has along with having them both being cost-effective for SMBs and easy to use.

Also, Zoho Inventory has features like budget-friendly, multi-channel order tracking and barcode scanning for quick fulfillment.

For local businesses the best WMS options are these two managers mentioned above, as they are cost-effective and easy to use but lack deep automation and AI. Knowing this, the team wanted the system to focus heavily on having a user-friendly interface, since our target audience may not have an IT team, barcode scanning and inventory tracking to reduce manual errors, order and shipment tracking for smooth fulfillment and cloud-based access so the user can manage inventory remotely. We also developed features for real-time inventory updates for users to always know stock levels, low-stock alerts to prevent shortages or stockouts, multi-location tracking so that the business can grow with our system since they would have access to multiple storage areas and customizable role base access control so that the user can have data integrity within the system. Our WMS is like other budget friendly systems, but different because of all the other functionality added to it to make it an all-in-one system for small businesses.

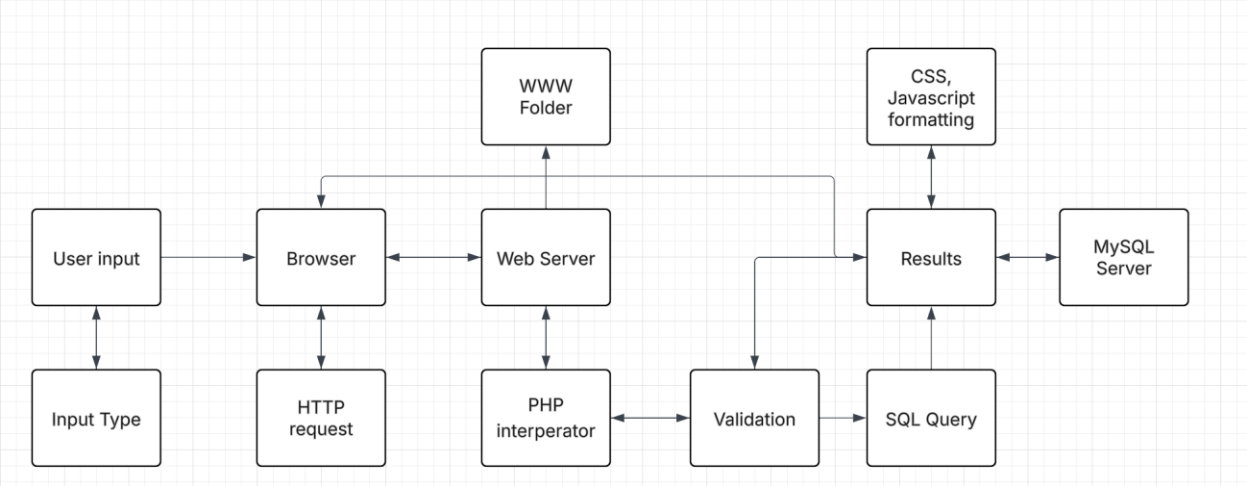
Community or social implications of the project

The positive impacts of our management system were one of the main driving forces for choosing this project. Some positive impacts are it would open new jobs in system management, IT support and logistics as our system would need to be maintained. There will be economic growth as our system will make for faster and more reliable supply chains which will benefit local businesses. Along with an enhanced consumer experience with the use of our efficient system, consumers will receive products quickly and correctly.

The implementation of our system will lead to a reduced environmental impact by optimizing inventory and shipping reduces our waste and carbon footprint. For all positives

comes negatives and some negative impacts can be workplace stress. Since the WMS uses real-time tracking to monitor worker productivity this can lead to a high-pressure environment. An economic disruption can occur within small businesses that are not using our WMS and may struggle to compete with large, automated warehouses.

System block diagram



This system block diagram shows the data processing of our warehouse management system web application. The process begins with the user interacting with an input form where the data is entered through specific input types. The browser sends a http request and sends the data to the Apache web server. Then the web server refers to the PHP script located in the WWW folder then this data is interpreted through the PHP interpreter. The PHP script performs input validation on the user input to ensure that correct data gets processed. If the input is valid a SQL query is called and then is sent to the MySQL server to retrieve or change the data. The browser receives the response and uses HTML to display the data, CSS for styling, and JavaScript to enhance dynamic behaviors. The result is then rendered in the browser therefore completing the cycle of user input to processed output.

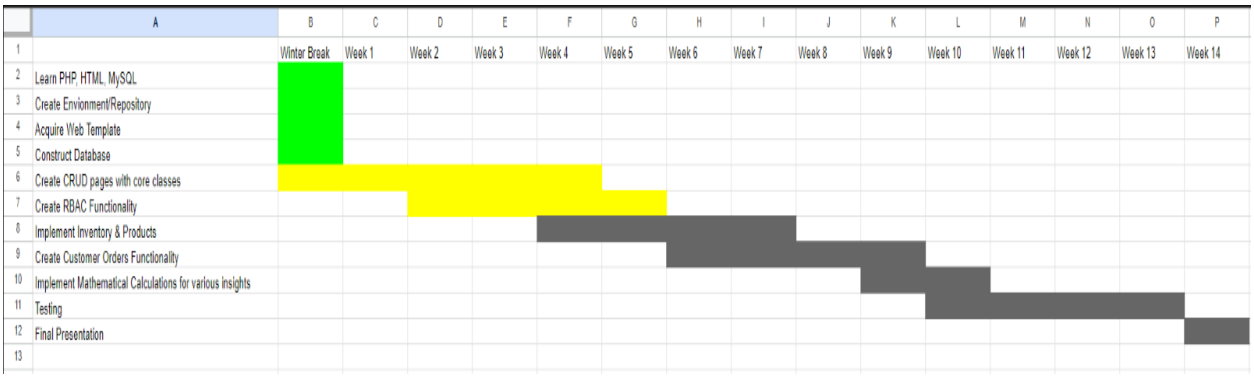
Project implementation details

Difference from design document:

The difference between this document and our design document is the construction of the document. Our design document is to give the development team a strong foundation to reference when developing this project. This will help aid and guide us through the functionalities and goals of this warehouse management system as well as keeping everyone on track without deviating too much from the source. That will include detailed descriptions of all the software and functions needed for the project to work effectively and efficiently. Along with the audience being different since the design document is mainly for developers, engineers, project managers and designers. While this document is displaying all the functionalities implemented within the final project from the design document. This includes plain language, screenshots, UI walkthroughs and a step-by-step guide. This document is made for the user, customers, or operators to follow understanding the structure and functionality of our web application to then being updated based on user feedback and product updates.

Another way that these two documents differ is that the team has had to alter some of the designs shown in our design documents. An example of this is the fact that we included nothing about vendor and customer containers but are included because of further thinking of how we wanted to construct the project. This can also be shown on various pages with added functionality that was not included in the design document since when implementing our ideas, we came up with new innovative ideas to make our system work even better by having new functionality we didn’t think of when designing our project.

The Gantt chart shown in figure gave the team a timeline at the beginning of the project. The team gave time slots to make sure there was enough time to implement all functionality required. There were many parts within the project that took longer than expected or required more thinking to move forward with cause for some implementations to be added before others. As well as there were new ideas like stated previously that were implemented in this phase that were not discussed in previous documents. This was offset by the fact that we started this project during the winter, so we got quite a bit done then. During this phase of the project, we have been focusing on adding functionality each week that helps the user enjoy our system.



Challenges during implementation:

There were many challenges when constructing this project with some being bigger than others, but some small challenges were things like getting our environment set up for each developer in the team and for each developer to understand a new language. Along with the structure of our data tables and how data is going to be displayed. Even though these are small they were essential to help with the foundation of everything else in the project. Other bigger challenges were the implication of RBAC which is our role-based access control system. The complication with RBAC stemmed from the fact that we had to go back and add this

functionality to each page and then test each page and the role to ensure that our system was working properly.

As well as getting vendor orders functionality created and the logic for utilizing the containers to associate with the vendor orders. When in development we realized that we would have to prioritize something else to process our orders which is why we added customer and vendor containers. These containers were important to separate vendors' and customers' orders so that managers can distinguish which orders we are dealing with. Since this was not a part of our design, we had to pivot to which took a lot of time to develop and implement. So overall the main challenges were getting vendor orders functionality created. The logic for utilizing the containers to associate with the vendor orders, getting customer orders functionality created the logic for utilizing the containers to associate with the customer orders, reworking functions of customer orders for improved readability, the implementation of multiple modals for different issues and actions on the same page.

Use of software engineering principles

The team used the project construction standards discussed in previous documents during the Fall semester to develop our WMS. The project was broken down into the requirements, specification, design, and implementation.

The requirement phase was completed early in the project, the document contained information that was an overview and refined the team’s project and its idea’s. This was the beginning of our project and was the foundation of future documents. Some of the ideas within the document were changed or added throughout the project’s progression, but the bases of the ideas remain throughout all our phases.

The next phase was the specification document which was completed mid-semester during the fall. This was a curial phase since it was necessary to define each process and how it would function with set software. The construction of this document gave us insight into how exactly each component would function and interact with each other. There are different flowcharts and block diagrams that were created to help visualize the process and future of the project.

We wrapped up the fall semester with and design document which provided a full breakdown of each module and went over each process needed for the project. This helped find and handle future logical errors and improved the overall structures of the program.

The implementation phase was set up by the previous phases and will be completed over the duration of the spring semester. It was important to refer to these documents so when the team began implementation, we had a guide to assist us through each function we wanted in the project. A Gnatt chart was made to manage implementation time with each function added along with a changelog that held all our commits, which were tested during development and then pushed to our environment to then be added to the software.

User's Manual

Our Warehouse Management System was designed and developed with employees and employers that work in a warehouse in mind. This system has dynamic features for all its users, including automating inventory updates, stock management, and data security. Our application is a tool for managing and storing inventory within a warehouse allowing for businesses using it to grow.

Login

To login to the WMS application, the user must be added by their employer who hired them. The employer will need to direct themselves to the user's add page which is under Administration > Users > Add User shown in figure 2.1.

2.1 Warehouse Management System Interface

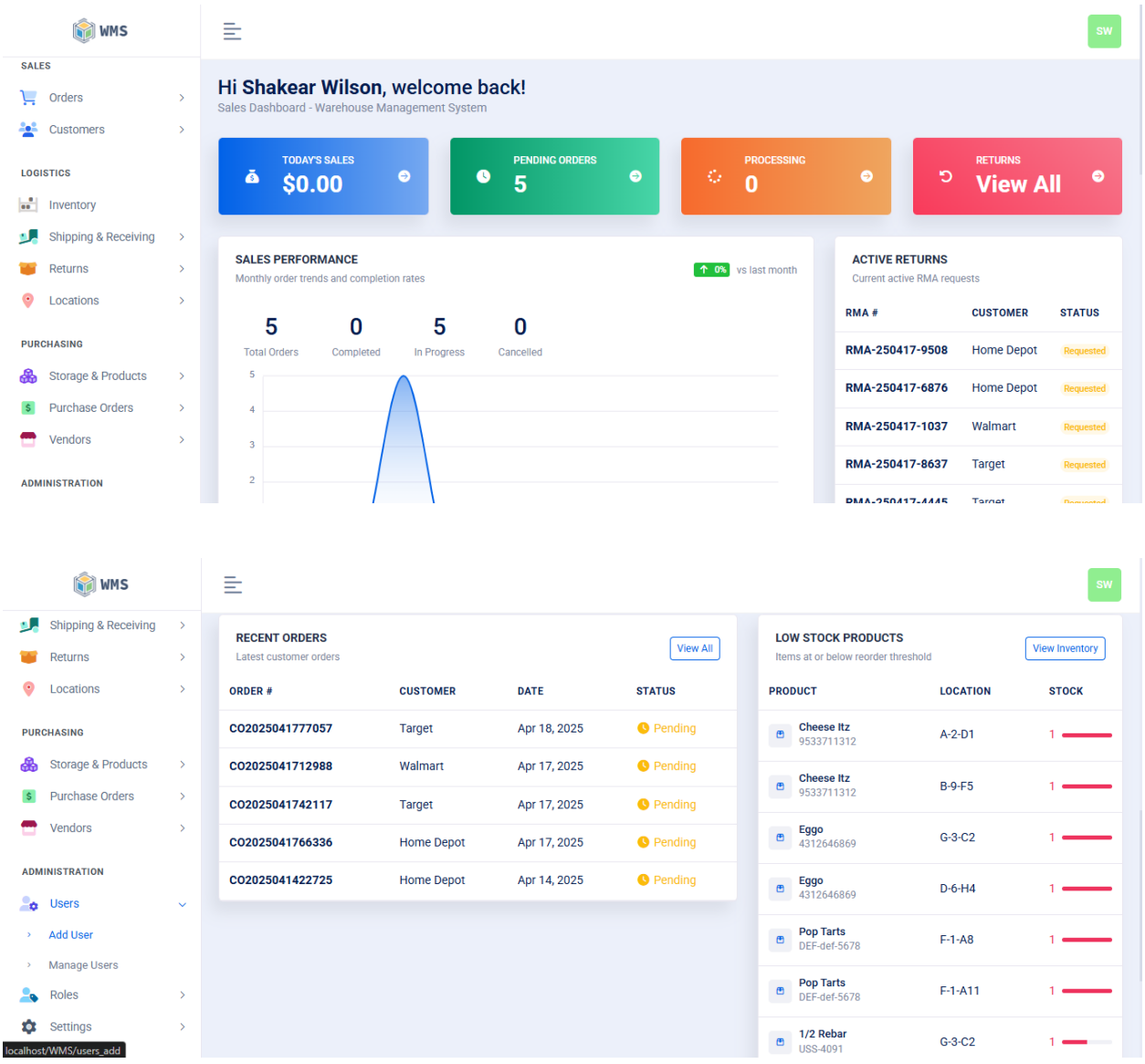


Figure 2.1 Warehouse Management System dashboard

2.2 User Login Information

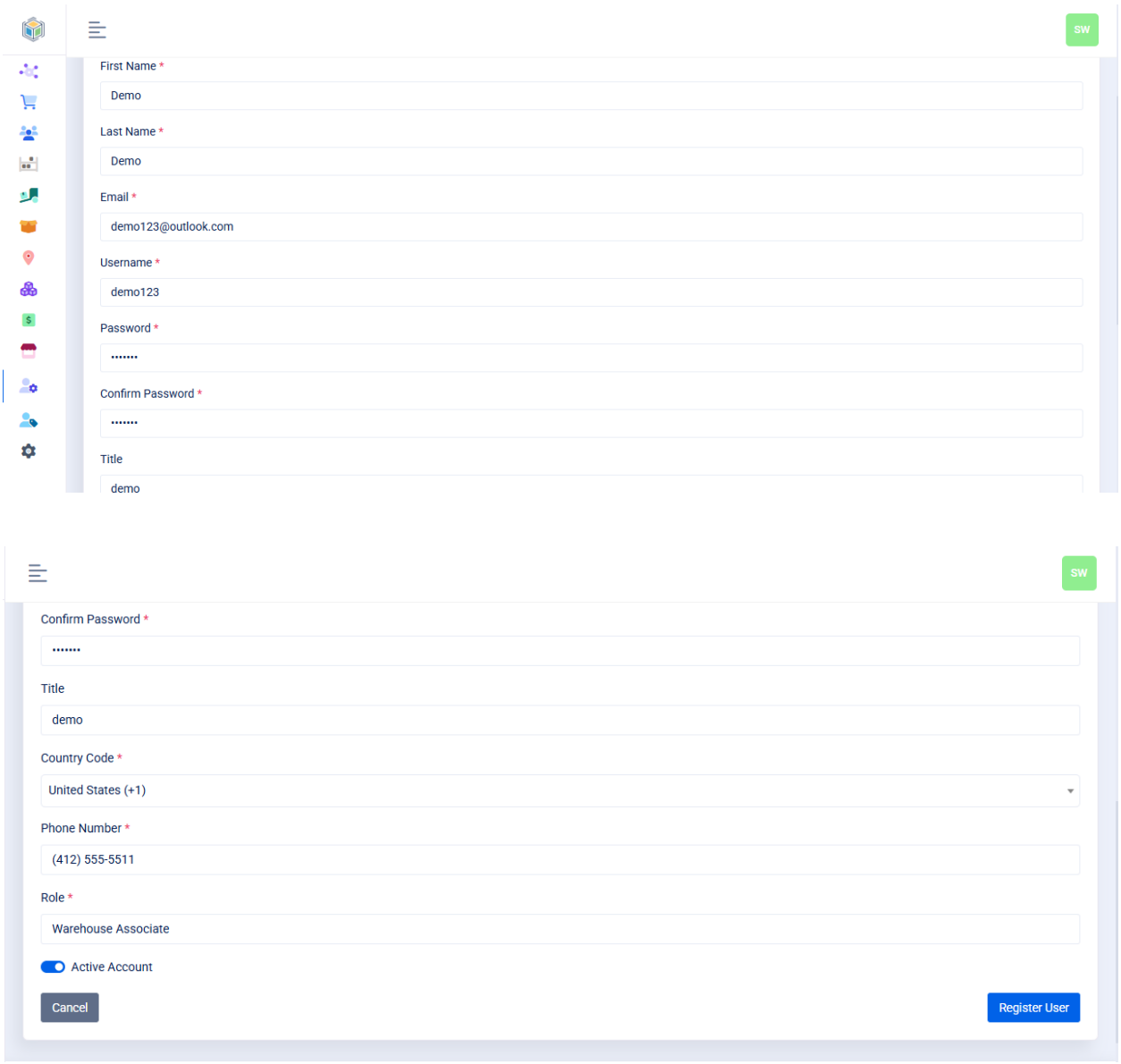


Figure 2.2 User Login Information administration view

Figure 2.2 shows the users add page on the employer's point of view since they are adding a new user to their system adding security. The information needed from the user is a first and last name, valid email address, username, password and a valid phone number. The administration will decide your title and role in the company and will activate your account.

2.3 User Login

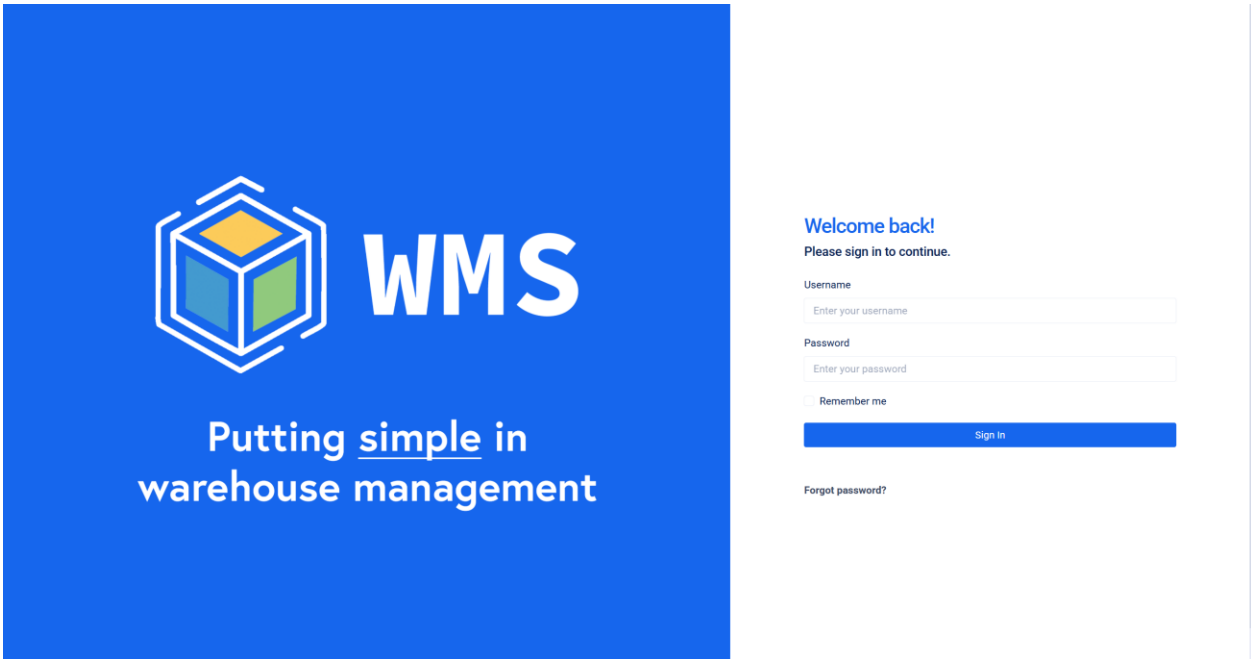


Figure 2.3 User Login user view

Figure 2.3 The user will then receive an email to activate their account, once the user clicks activate account on that email it will redirect the user to the login page. This display that your account is now active through email verification and now the user can login in with their username and password at: Login - https://wmsproject.bcolditz.tech/login

Welcome

After the user logs in they will be directed to our main dashboard which displays statistics about the company and on the left-hand side shows the pages that are available. There are various pages the user can see and interact with, the user's access to some pages might be limited since they are based on a role. A role will grant you access to specific pages with features needed for that set role, making other pages inaccessible for that user that don't involve set role. As stated previously, these roles are assigned by administration.

Transition to different type of roles and go in-depth on the feature that are on set page for that role and why they are important for that user to have.

Warehouse Assoicate

A warehouse associate plays a key role in a warehouse when dealing with incoming shipments, order fulfillment and warehouse organization. The associate will be involved in tasks like receiving and unloading shipments, inspecting and organizing inventory, picking and packing orders and potentially operating warehouse equipment.

3.1 Warehouse Associate

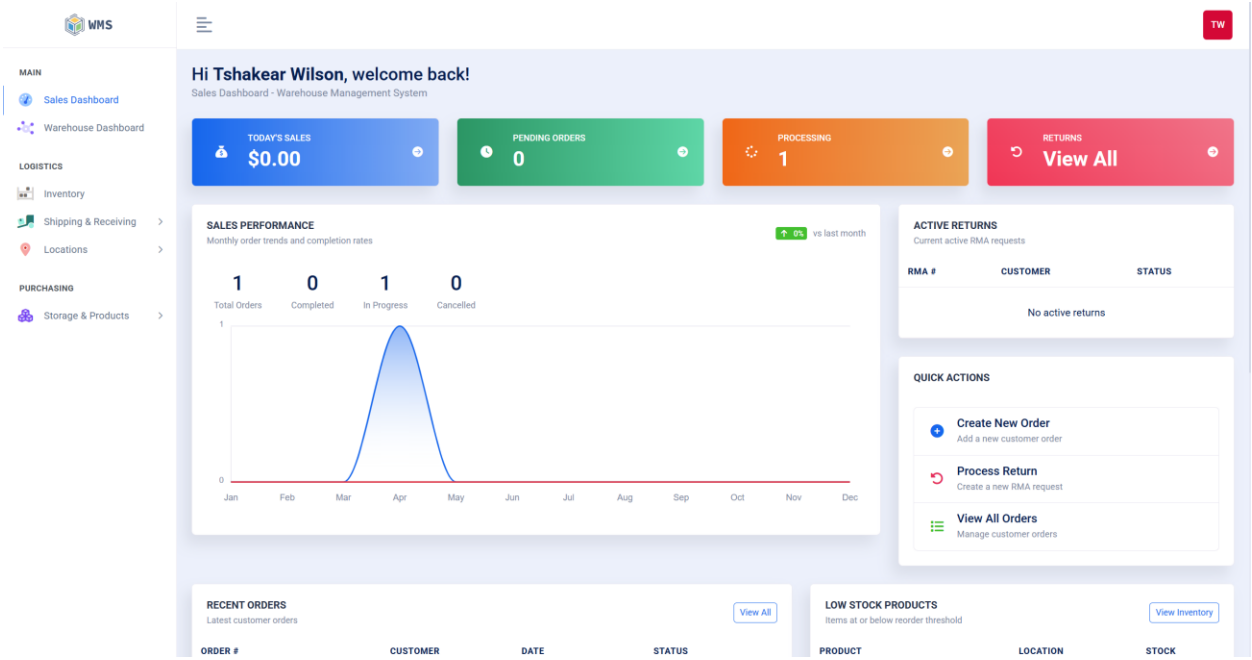


Figure 3.1 Warehouse Associate dashboard view

Figure 3.1 A warehouse associates permissions consist of a dashboard, inventory, shipping & receiving, locations and storage & products. These are the only pages a warehouse

associate will have access to as these are the only pages needed for them to do their job efficiently.

3.2 Warehouse Associate Inventory

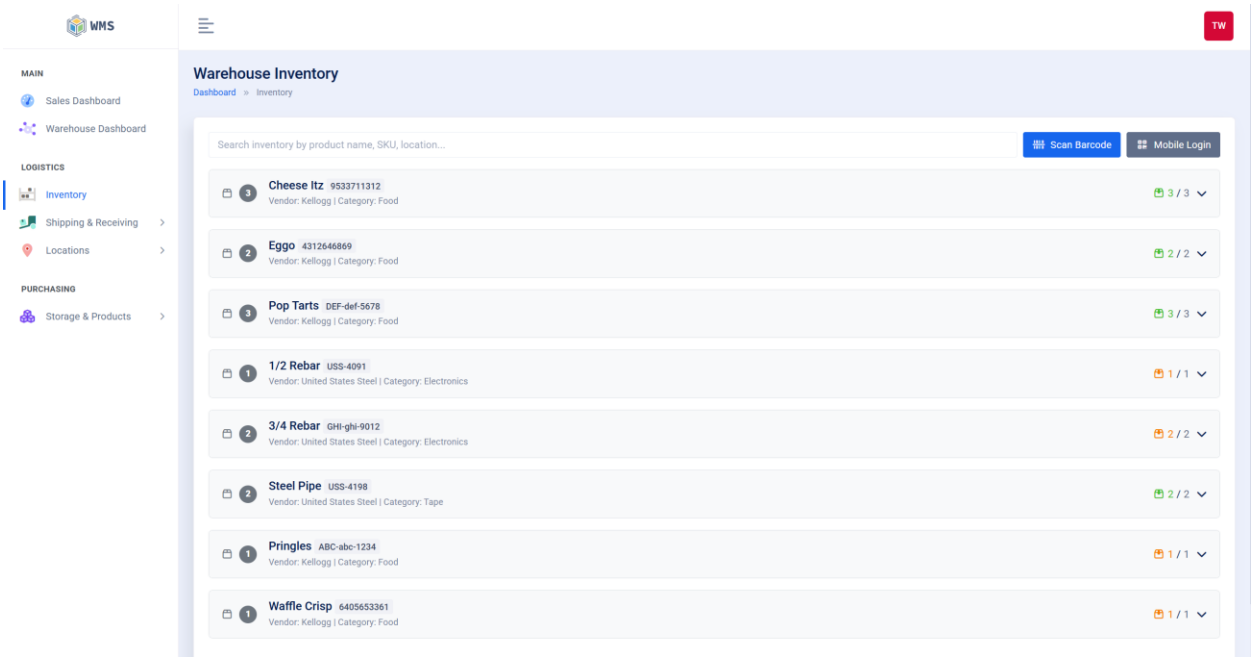


Figure 3.2 Warehouse Associate inventory view

Figure 3.2 This page has many different features and data that the user can interact with. There is a search field for the users to search inventory by product name, sku or locations. Other features on this page include barcode scanning, mobile login and printing out product labels which will be discussed later. The data shown on this page includes the products that are in the warehouse inventory, the quantity of that product and the different containers that the product is being stored in.

3.3 Warehouse Associate Shipping & Receiving

Figure 3.3 Warehouse Associate Shipping & Receiving view

Figure 3.3 The warehouse associate will have two options under Shipping & Receiving, incoming and outgoing shipments. Incoming shipments are the products that are being delivered to the warehouse from our vendors. The process begins when an order is placed, and the vendor sends an advance shipping notice detailing what has been sent. Once the shipment has arrived, the warehouse staff checks those items and conducts an audit. Outgoing shipments deal with getting products out of the warehouse and sending them to a customer. The associate will pick and pack the products according to the order. The order will then be handed off to a delivery service for transportation.

3.4(a) Warehouse Associate Incoming Shipments

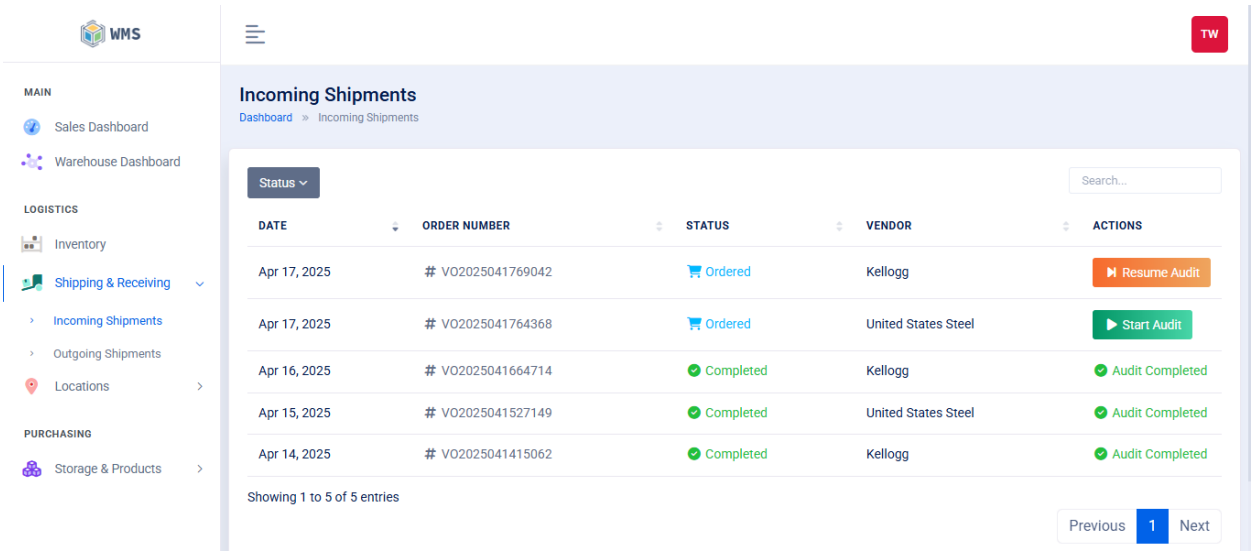


Figure 3.4(a) Warehouse Associate incoming shipment's view

Figure 3.4(a) This page's features consist of order sort that is based on the status of the order, or the user can use the search field to search for a specific order. The user will have the option to resume an audit or to start an audit on an incoming order.

3.4(b) Warehouse Associate Incoming Shipments

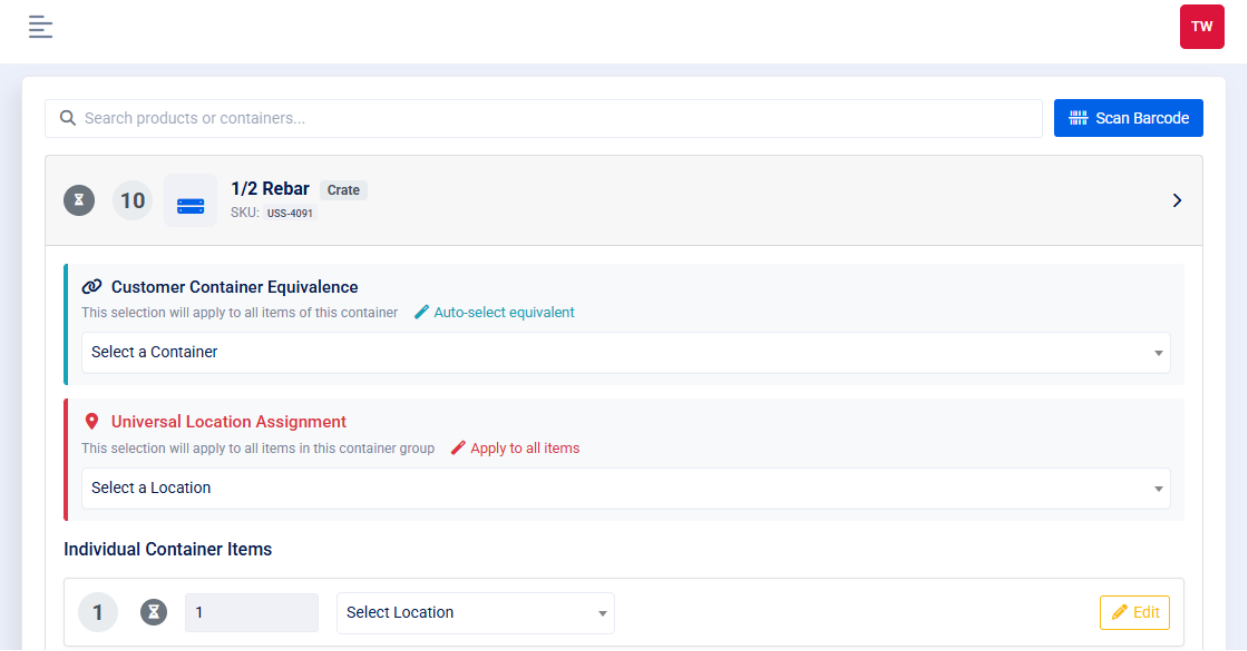


Figure 3.4(b) Warehouse Associate incoming shipment's view

Figure 3.4(b) This page is where the associate will conduct their audit on a specific order. The information on this page consists of the product, product container, SKU and the quantity of the product that's coming in. Some features are a search field to search for products or the container along with barcode scanning functionality. The data that the user needs to input is to assign a customer container for set vendor product and to assign locations for all products in the order. Customer container equivalence that is shown in figure 3.4(c) shows how the user will select or search for a customer container, if the user uses auto-select equivalent then the system will try to find a container that fits the description. The same thing applies for universal location assignment and setting a location for a single product; the user can select or search for a location that's in the warehouse and assign that location to all products in that drop down by using apply to all items. After all items are processed then the audit can be completed shown in figure 3.4(d).

Figure 3.4(c) Warehouse Associate Incoming Shipments

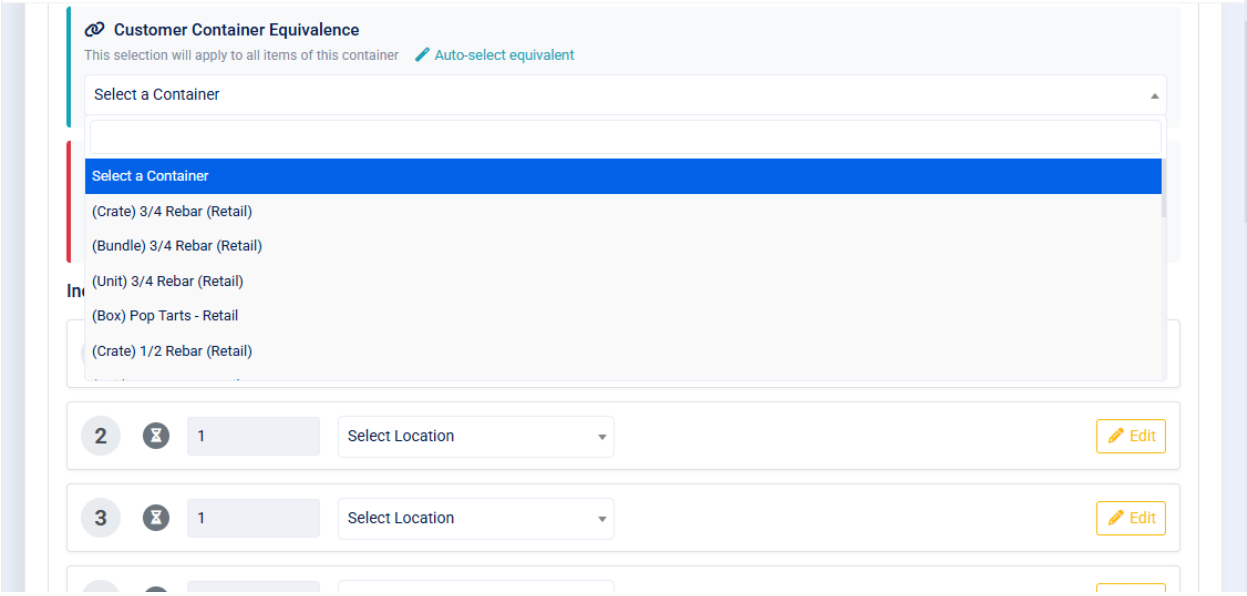


Figure 3.4(c) Warehouse associate incoming shipment audit page

Figure 3.4(d) Warehouse Associate Incoming Shipments

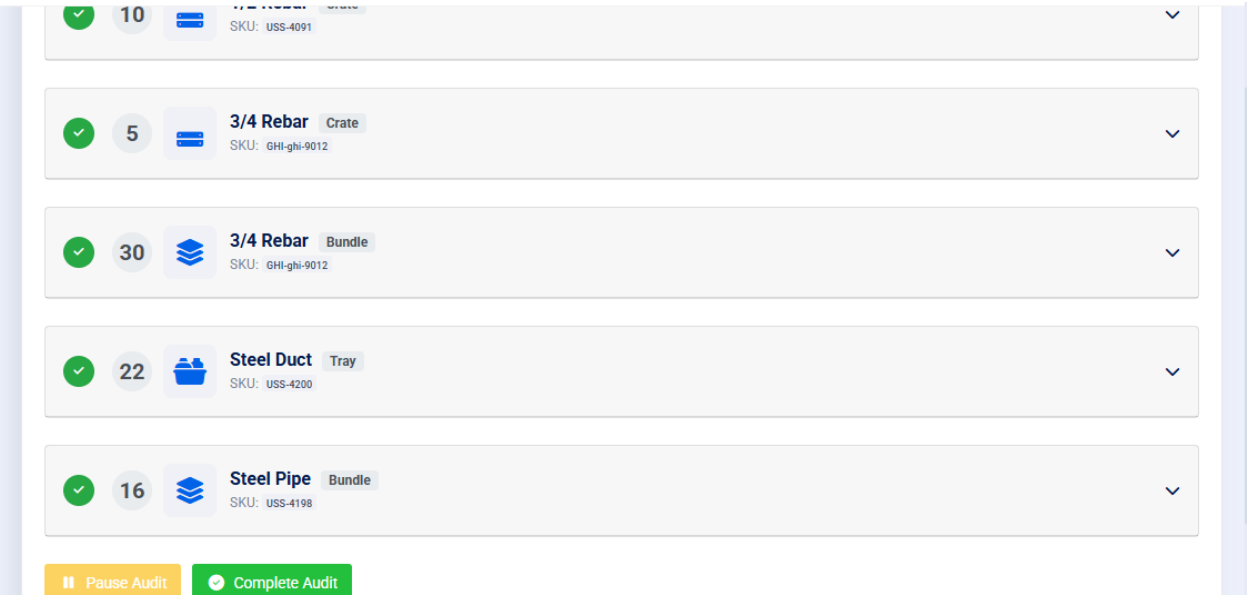


Figure 3.4(d) Warehouse associate incoming shipments audit page completion

3.5(a) Warehouse Associate Outgoing Shipments

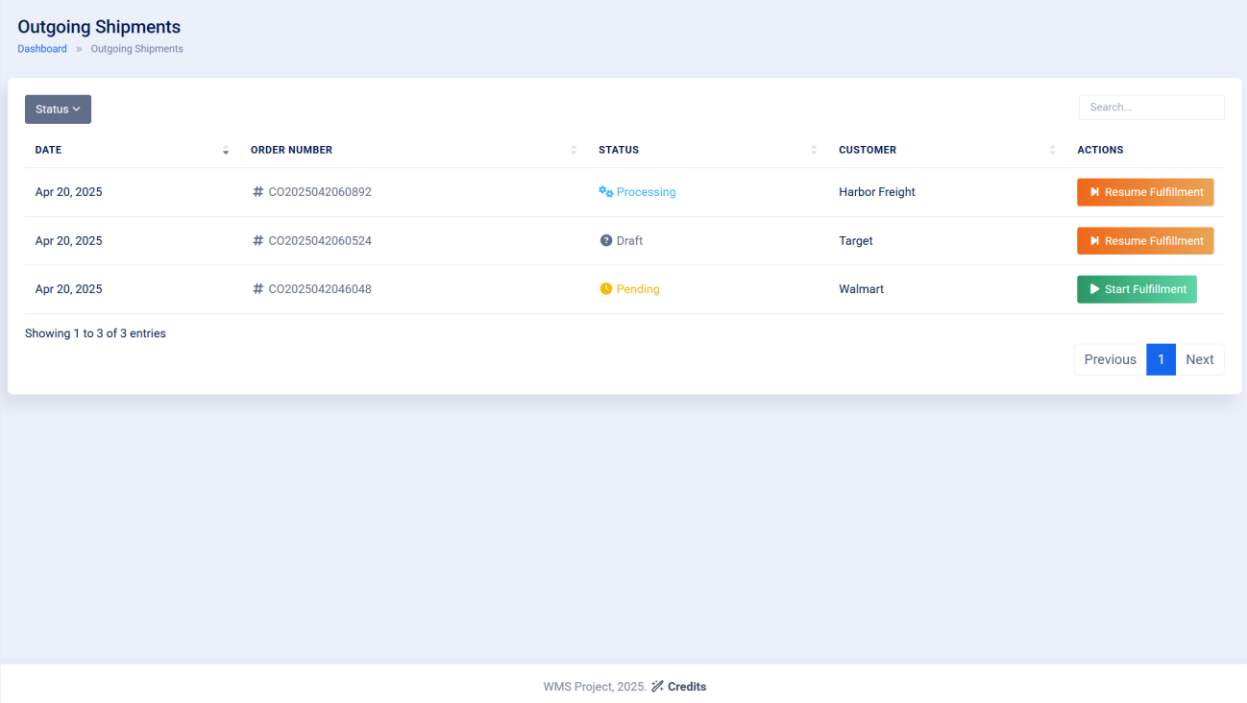


Figure 3.5(a) Warehouse associate outgoing shipments page

This figure shows the page that the user would follow to then complete an outgoing shipment. When the user clicks start fulfillment, they will be redirected to our fulfillment page as shown in figure 3.5(b).

3.5(b) Warehouse Associate Fulfillment

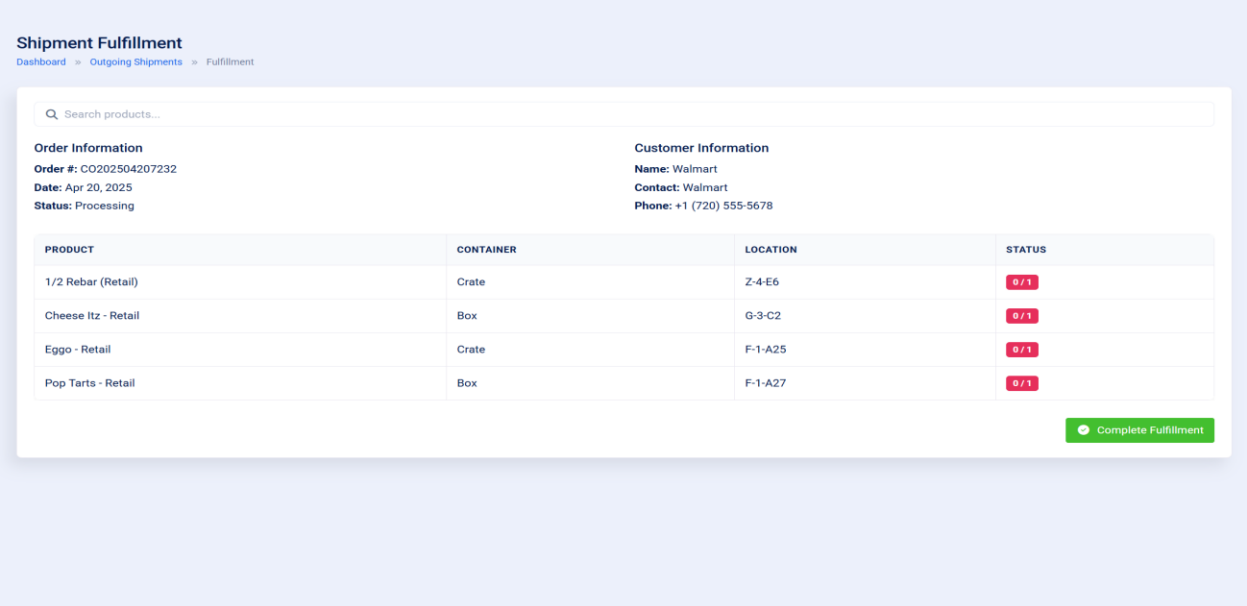


Figure 3.5(b) Warehouse associate outgoing shipments fulfillment page

This figure shows all the products that were in the customer's order, and they need to be fulfilled. How the associate would do that is based on the user scanning the product label and the system will automictically update the status of that product. After all the products are scanned and the order can be fulfilled and can be sent to the customer.

Warehouse Associate Conclusion

The warehouse association also has access to locations including positions, levels, bays, racks and colors and storage & products pages that include vendor and customer catalog as well as vendor and customer containers. An associate work will not involve these pages, but they will still need access to them to view their data. They will only be able to view the page and will not be allowed to edit or add or delete these pages, the functionality and structure of these pages will be displayed in other roles.

Inventory Manager

An inventory manager in a warehouse plays a central role in ensuring that the flow of goods in and out of the facility is smooth, accurate, and efficient. Their job is all about control, coordination, and visibility over inventory from the moment products arrive to the moment they leave.

4.1 Inventory Manager

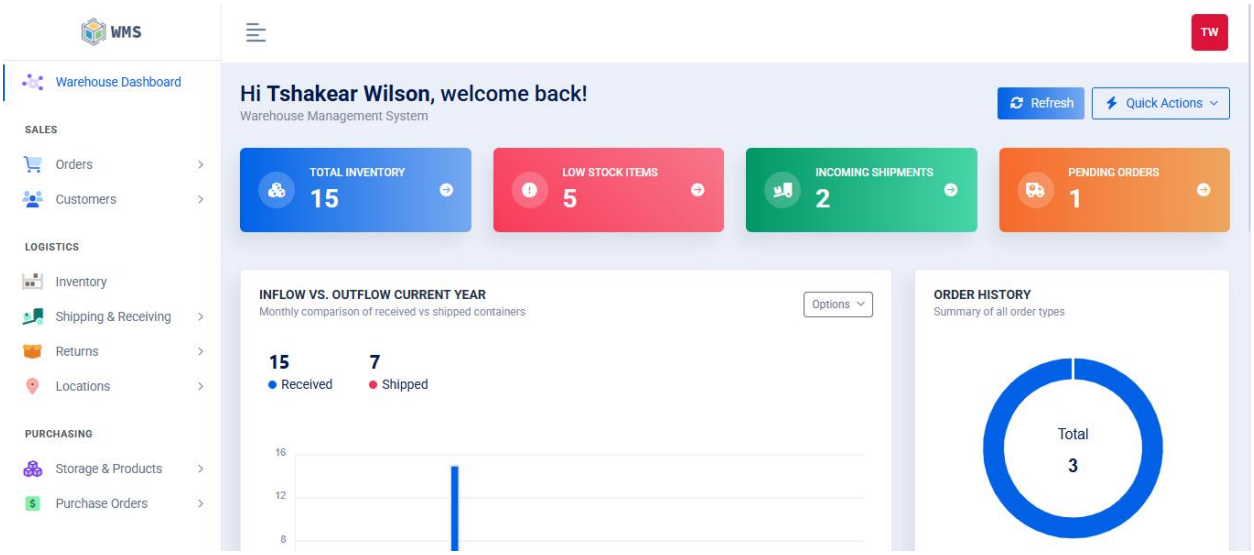


Figure 4.1 Inventory managers dashboard

In figure 4.1 the pages shown on the dashboard are all the pages needed for an inventory manager to do their job at a high level. Although these permissions look like a warehouse associate, there are many differences like the returns, purchase orders, orders and the features that are available in locations.

4.2Inventory Manager Locations

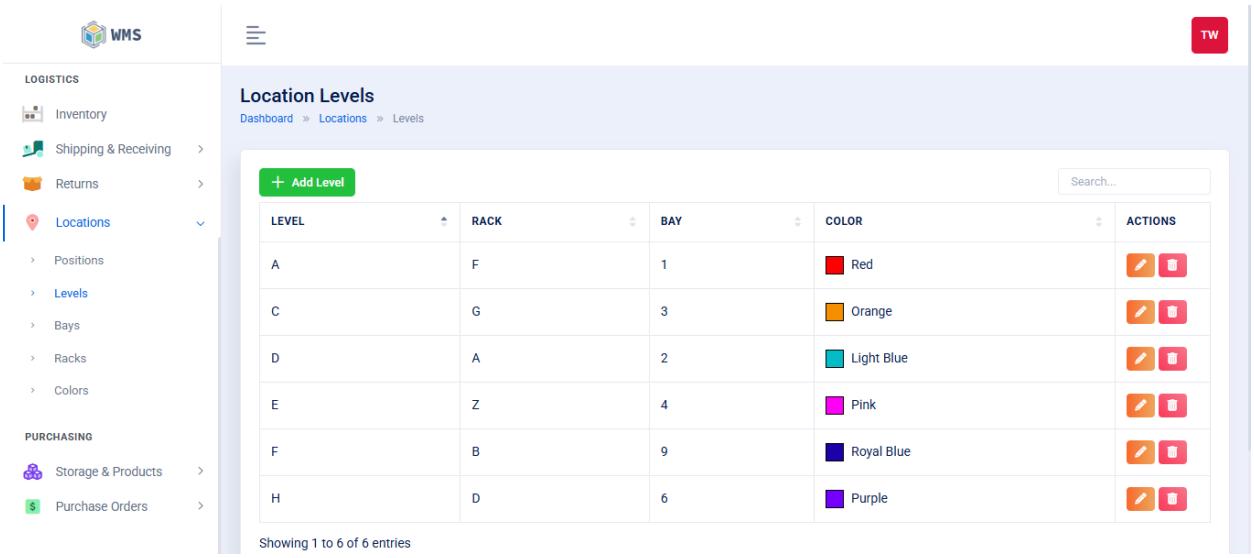


Figure 4.2(a) Inventory manager locations

Figure 4.2(a) shows how locations are going to be constructed throughout the warehouse. A location in the warehouse needs a rack, bay, level and color. When the inventory manager is done making the level then they can finish the locations by adding a position to it. These levels can be added, edited and deleted upon the user's request. There is also search functionality that is built into the page.

4.2(b) Inventory Manager Locations

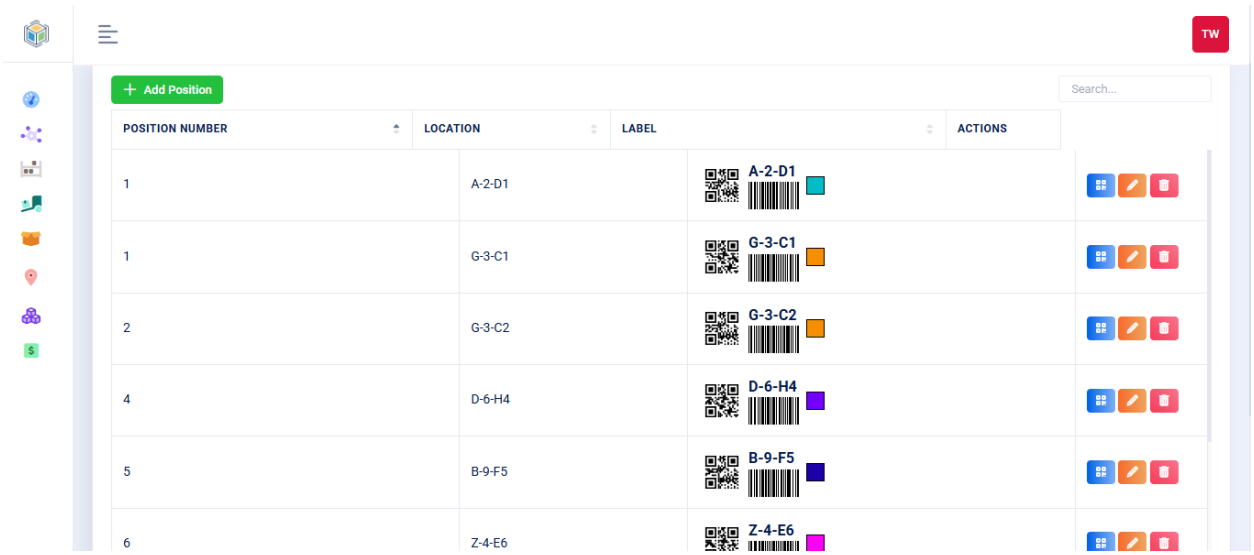


Figure 4.2(b) Inventory manager locations

Figure 4.2(b) is the final step to creating a location and this is achieved by adding a location. This page has search functionality on it along with being able to print a location label, this label will hold information about the location. The user is allowed to add, edit and delete any location that they deem fit.

4.3 Inventory Manager Purchase Orders

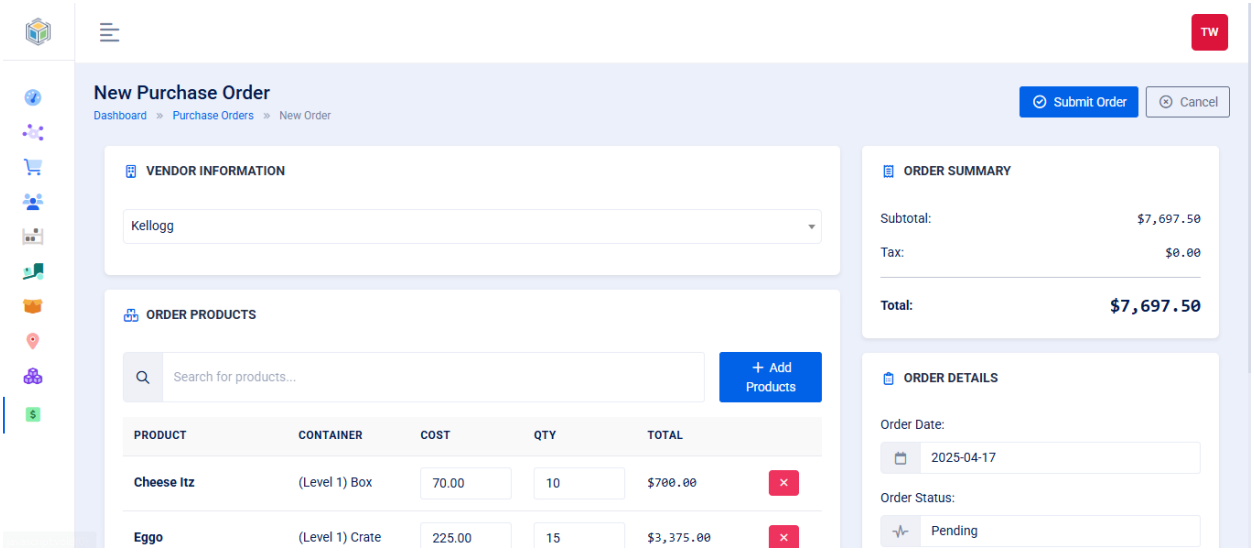


Figure 4.3 Inventory manager new purchase order

Figure 4.3 shows that an inventory manager can create a purchase order which is important so that the inventory manager can reorder items that are low stock but will have to wait to get it approved from high ups. They can also view purchase orders to then conduct a return on them shown in figure 4.3(b).

Figure 4.3(b) Inventory Manager Returns

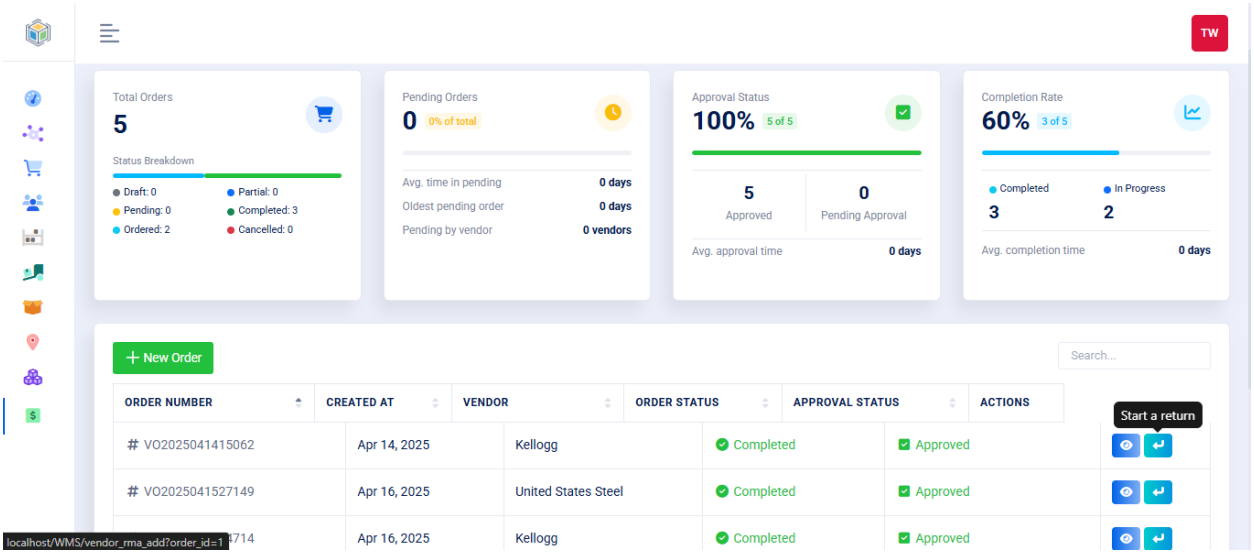


Figure 4.3(b) Inventory manager managing purchase orders

4.4 Inventory Manager Vendors Return

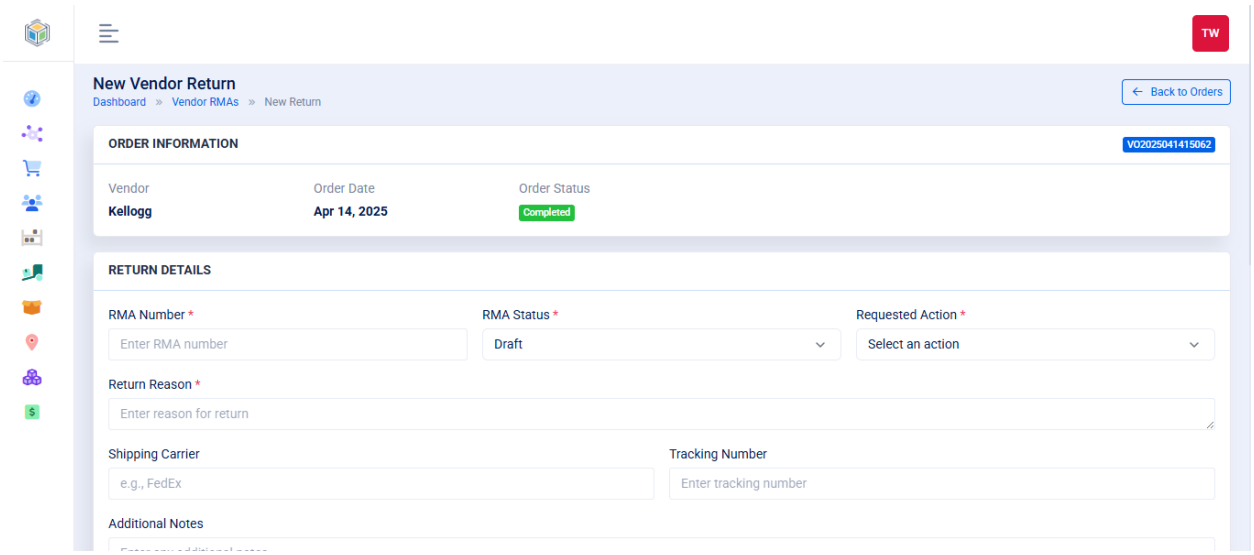


Figure 4.4 Inventory manager vendors return page

This figure displays the information that is needed to start a vendor return along with some general information about the order. The information needed includes RMA number, requested action, return reason and the selected products that will be returned, the user can also include the tracking number and shipping carrier. The requested actions can be a replacement product, a refund or store credit. The products also have a drop down for their conditions which can be used, damaged or defective, the reason for the return can also be specified. After all conditions are met then the user can submit the return which can be shown in figure 5.4(b).

Figure 4.4(b) Inventory Manager Vendor Returns

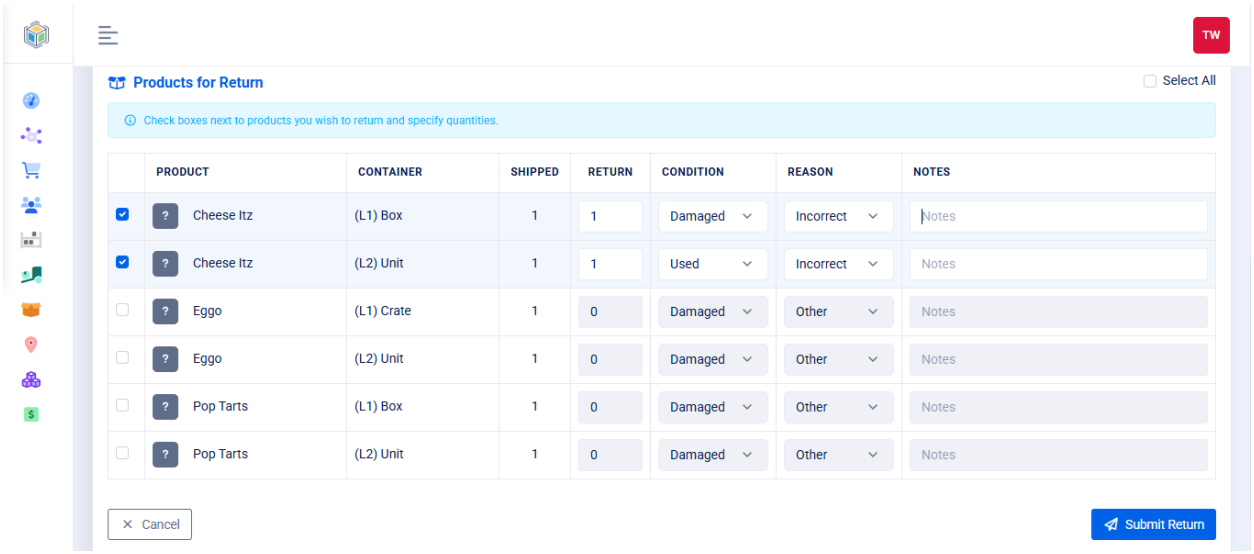


Figure 4.4(b)Inventory manager product selection for vendor returns

4.5 Inventory Manager Vendor RMAs

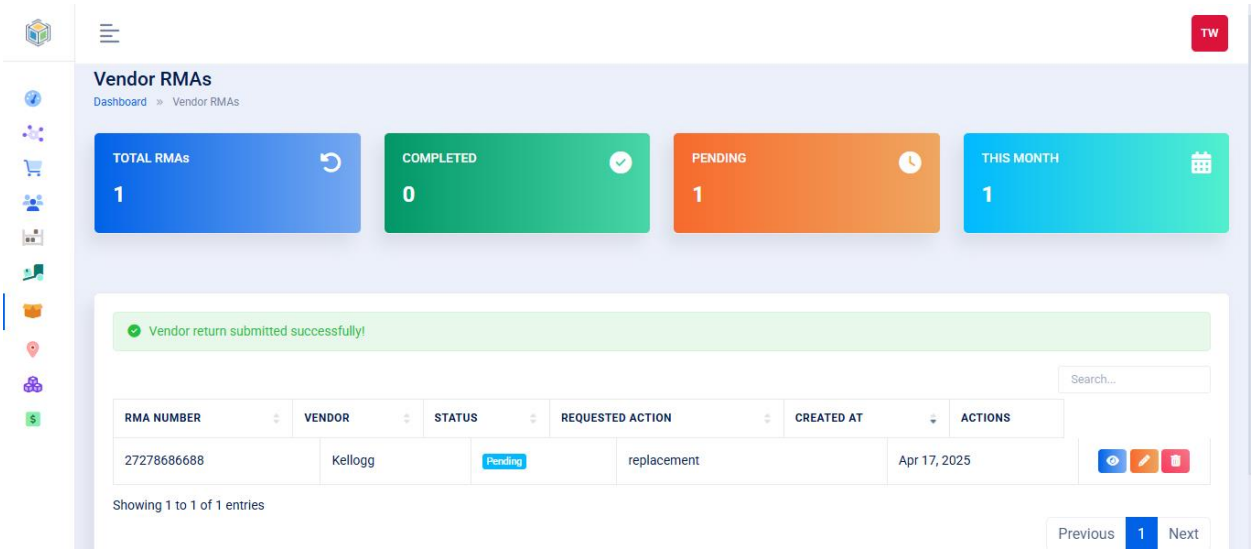


Figure 4.5 Inventory manager vendor RMAs page

This figure displays our system's Vendor RMAs which has information about completed, pending and total RMAs that are in the system. On this page the inventory manager can view, edit and delete vendor RMAs.

4.6 Inventory Manager Customer Returns

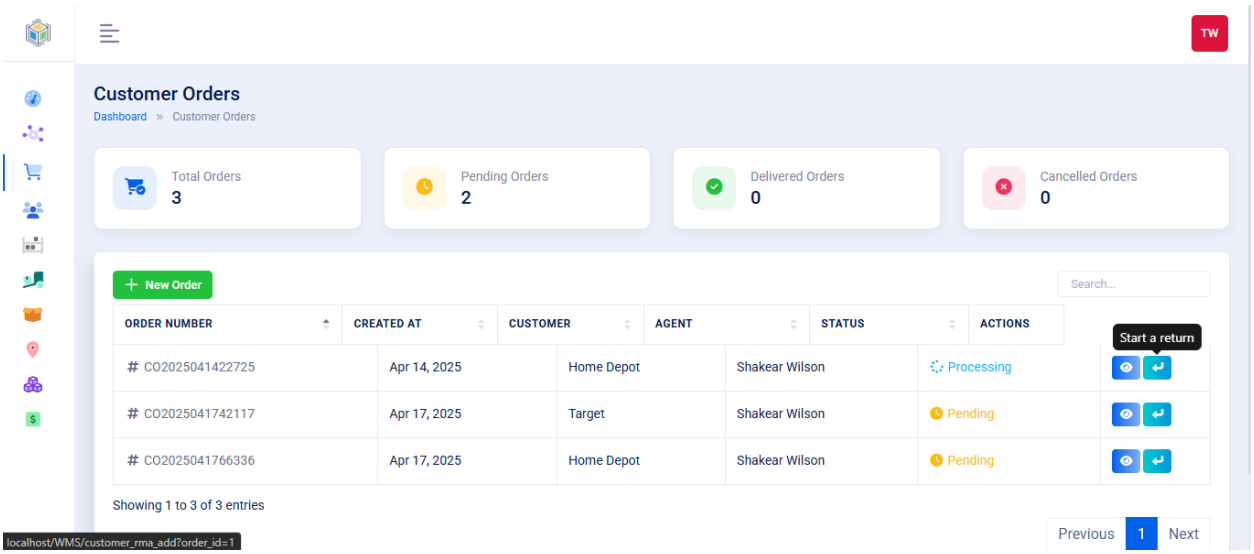


Figure 4.6 Inventory manager customer orders page

This page shows information about customer orders like total orders, pending orders delivered or cancelled orders. In this figure the inventory manager will need to navigate to the customer orders page to start a return for that customer's order. The inventory manager can also view and create customer orders.

4.7 Inventory Manager Customer Returns

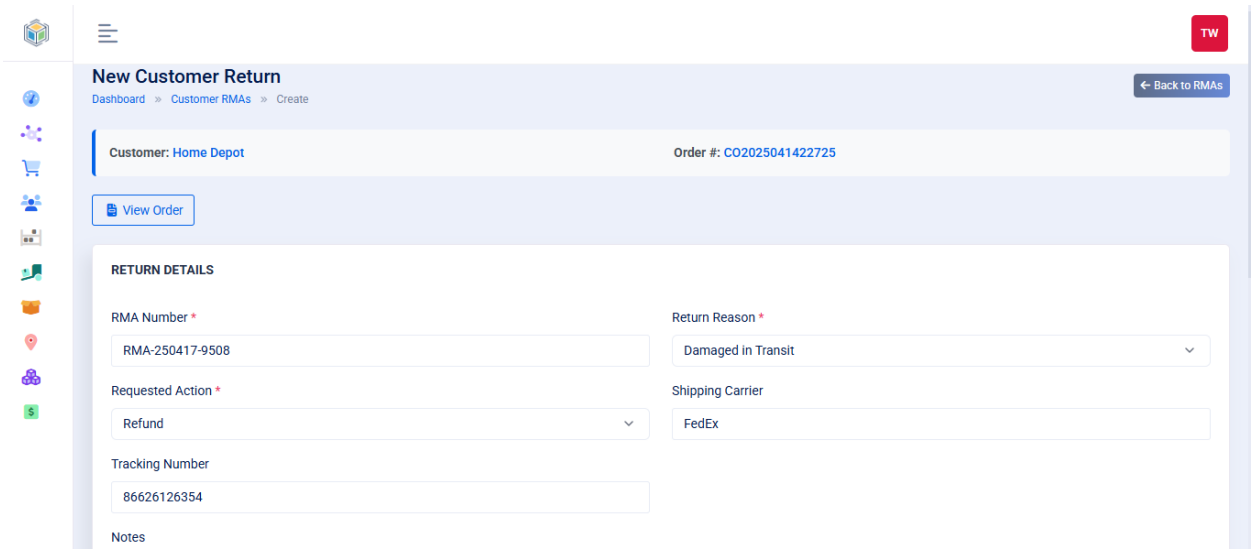


Figure 4.7 Inventory manager customer returns page

This page is just like the vendor returns page with the information needed being the requested action, return reason and the selected products that will be returned, the user can also include the tracking number and shipping carrier. Some bilipid information is the customer and the customer's order number. The user can also click on view order to view the customer's order that they are conducting a return on. The requested actions can be a replacement product, a refund or store credit. The products also have a drop down for their conditions which can be used, damaged or defective, the reason for the return can also be specified. After all conditions are met then the user can create a customer RMA which can be shown in figure 5.7(b).

4.7(b) Inventory Manager Customer returns

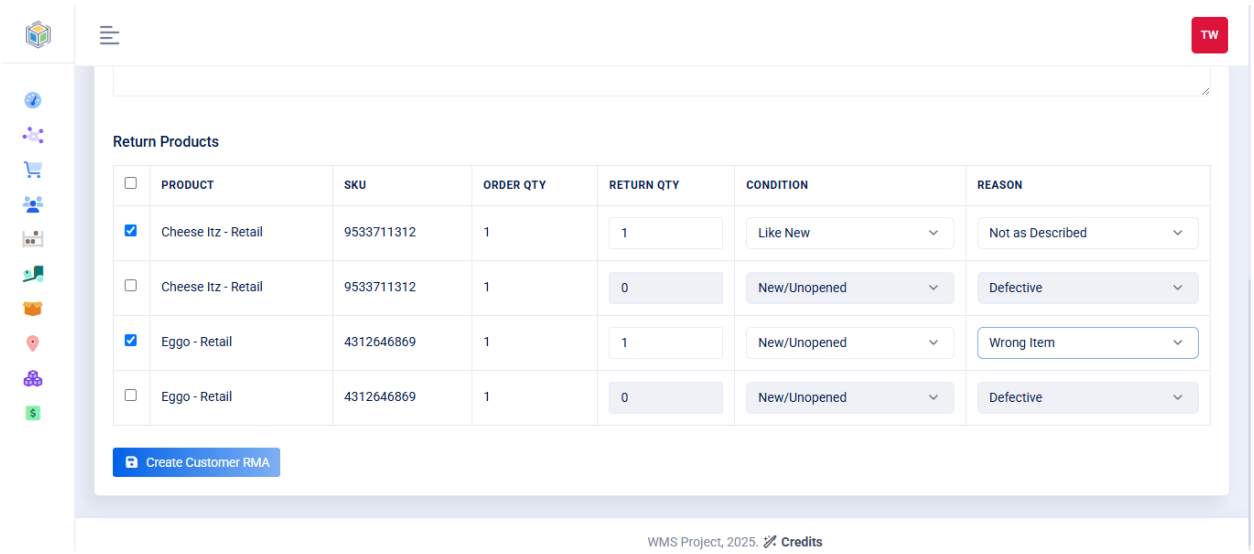


Figure 4.7(b) Inventory Manager customer returns page

4.8 Inventory Manager Customer RMAs

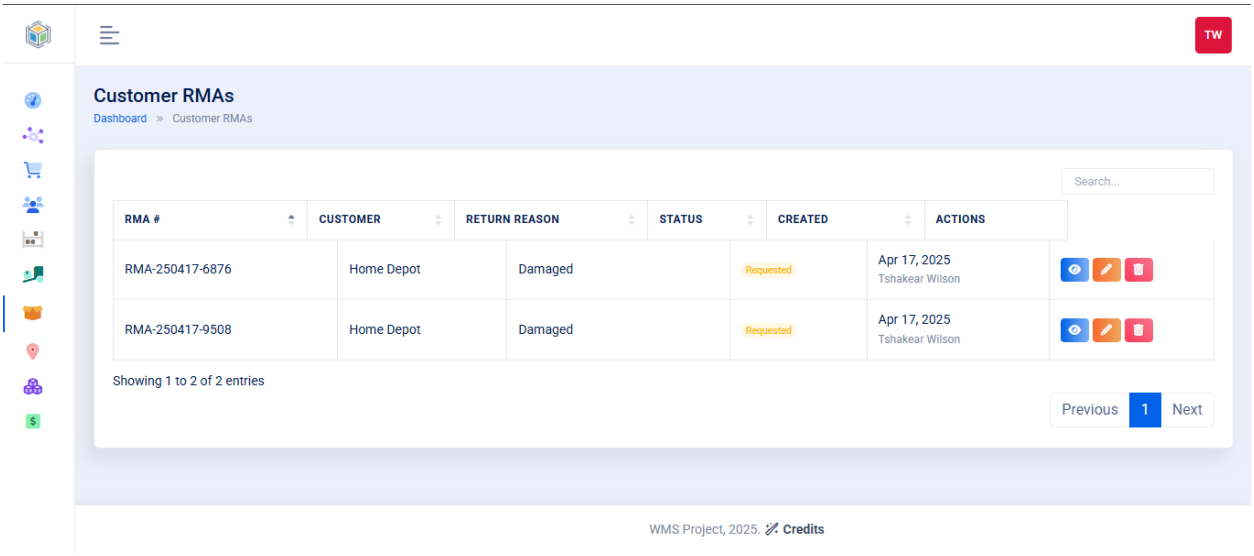


Figure 4.8 Inventory manager customer RMAs page

This figure displays our system's Customer RMAs page which has information on RMA numbers, the customer, the status and the date in which it was created. On this page the inventory manager can view, edit and delete customer RMAs. Currently the return is pending, if the

warehouse wants to approve the order the inventory manager would need to edit the return and set status to approved as shown in figure 4.9.

4.9 Inventory Manager RMAs

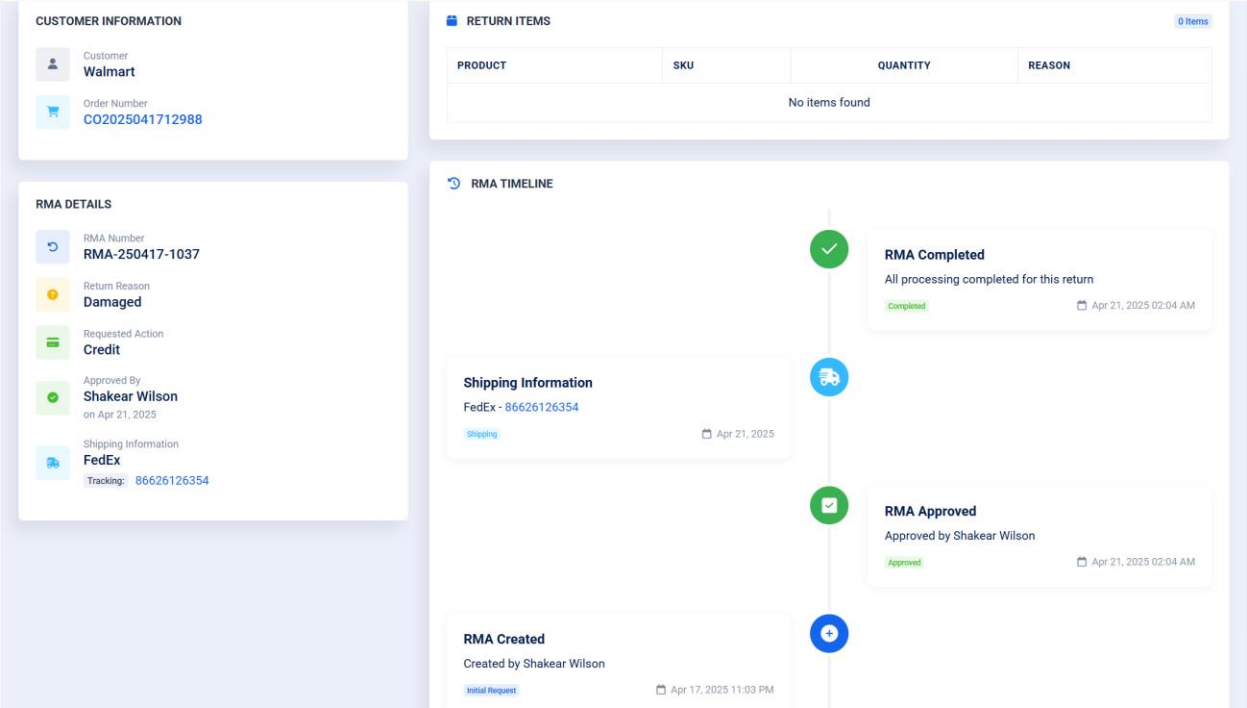


Figure 4.9 Inventory manager approving and completing a customer RMA

Inventory Manager Conclusion

The inventory manager also has access to storage & products pages that include vendor and customer catalog as well as vendor and customer containers. An inventory manager's work will not involve these pages, but they will still need access to them to view their data. They will only be able to view the page and will not be allowed to edit or add or delete these pages, the functionality and structure of these pages will be displayed in other roles.

Purchasing manager

A purchasing manager in a warehouse plays a critical role in ensuring that the facility is stocked with the right materials, products, and supplies needed to operate efficiently. While they aren't usually involved in the physical handling of inventory on the warehouse floor, their work directly influences everything from inventory levels to vendor relationships, lead times, and costs.

5.1 Purchasing manager

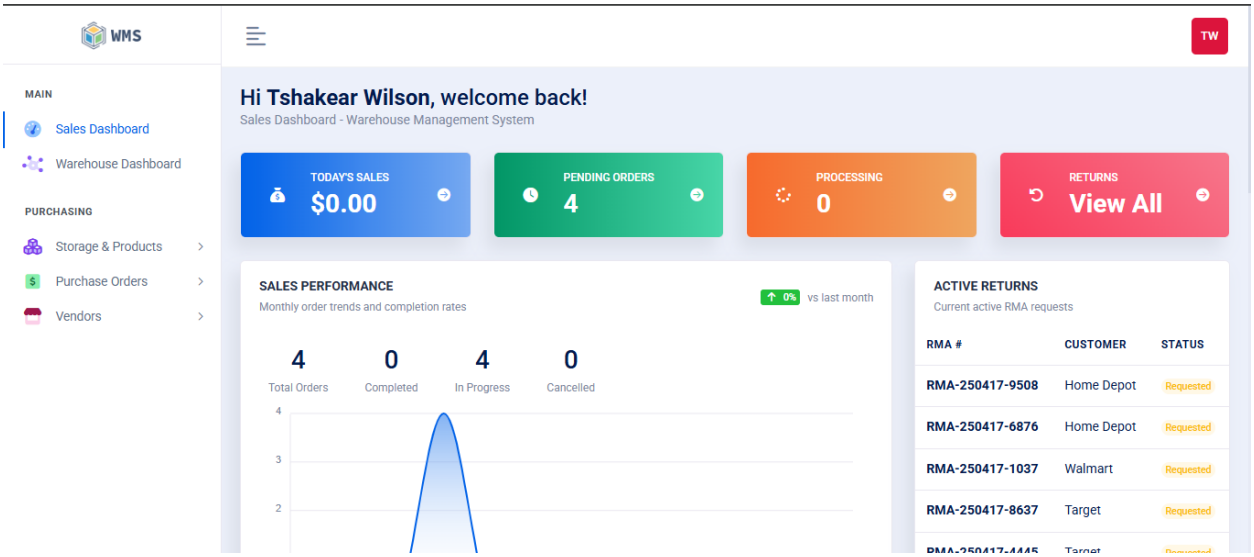


Figure 5.1 Purchasing managers dashboard

Figure 5.1 displays all the pages that a purchasing manager would access to. Purchasing manager's permissions consist of a dashboard, storage & products, purchasing orders and vendor. These are the only pages a purchasing manager would need to effectively help the warehouse.

5.2 Purchasing Manager's Vendors

Figure 5.2 Purchasing managers add vendor's page

Purchasing managers are responsible for creating new connections with vendors so that the warehouse has someone to order products from. In figure 5.2 the manager would need to enter the following information from the vendor, the name of the vendor, address, city, state, postal code and the country the vendor is from. Once all the data is entered properly and submitted their vendor will then be added to the warehouse vendors, shown in figure 5.2(b).

5.2(b) Purchasing Manager Vendors

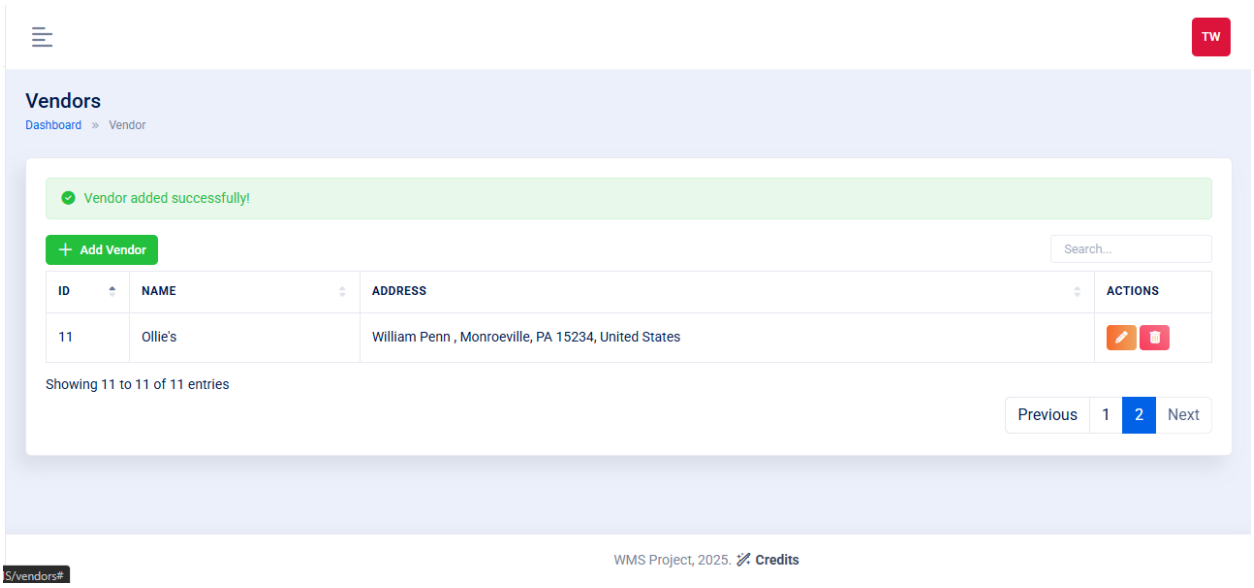


Figure 5.2(b) Purchasing manager vendor's page

5.3 Categories

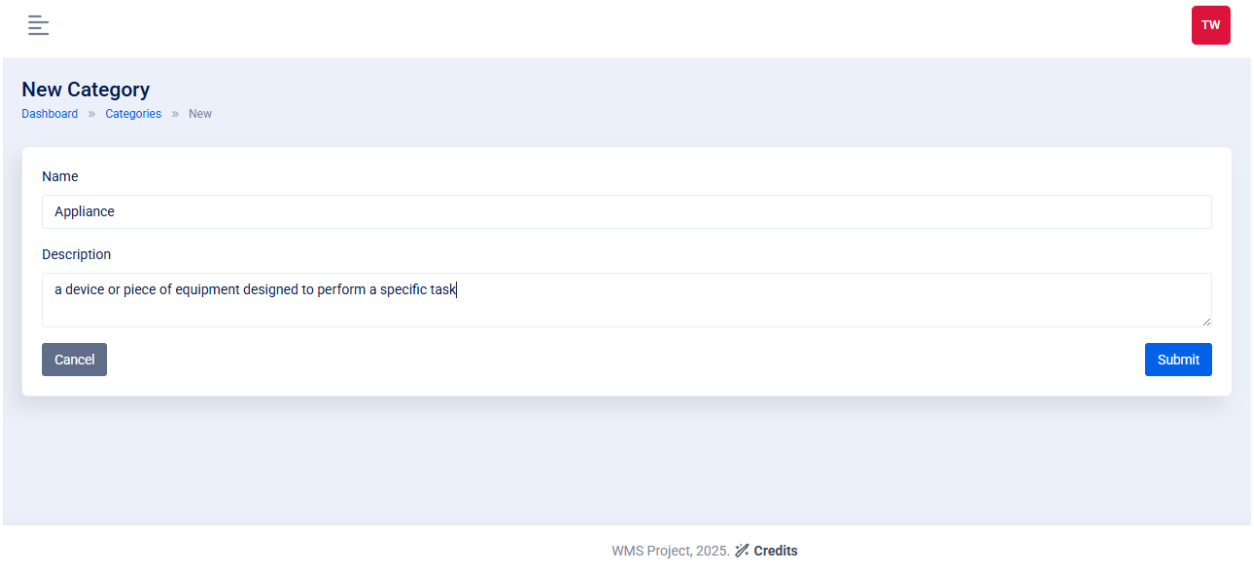


Figure 5.3 Purchasing manager categories add page

Figure 5.3 shows a basic page that requires a name and description to make a category that is going to be assigned to products that the manager buys from its vendors.

5.4 Purchasing Manager Vendor Catalog

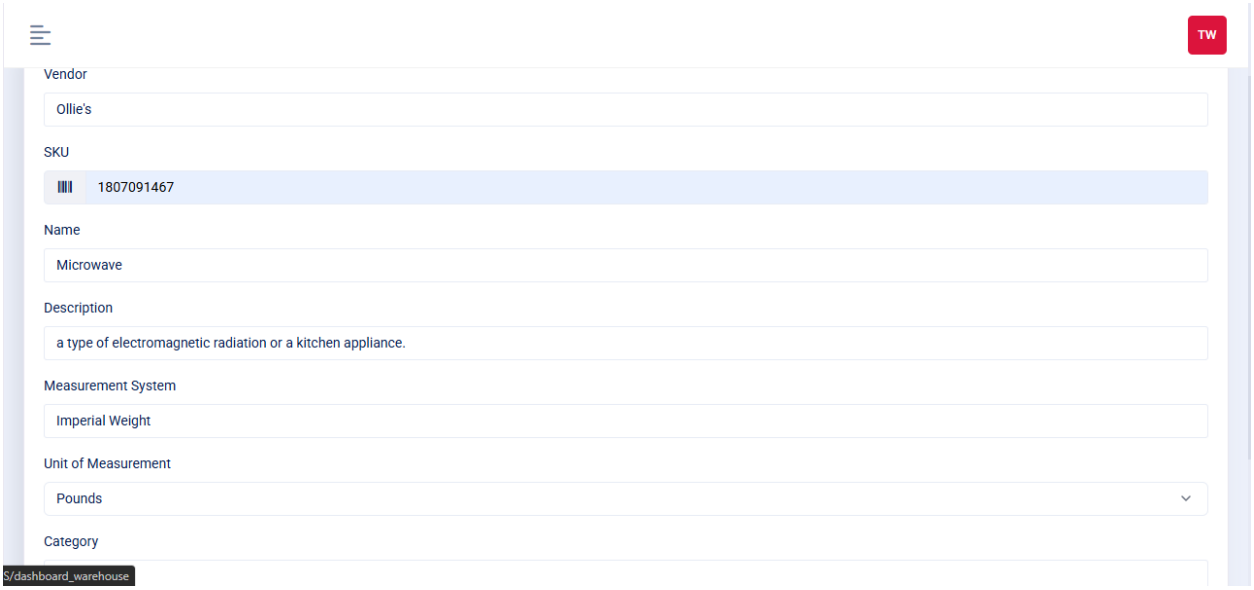


Figure 5.4 Purchasing manager vendor catalog add page

This page is crucial for a purchasing manager as this is the page that will add new products for the warehouse to order from. As seen in figure 5.4 we need a vendor, SKU, product name, measurements for set product and a category. In this example we'll use the vendor made in figure 5.2(b) and the category from figure 5.3. Once submitted, that product is now a part of vendor products shown in figure 5.4(b).

5.4(b) Vendor Products

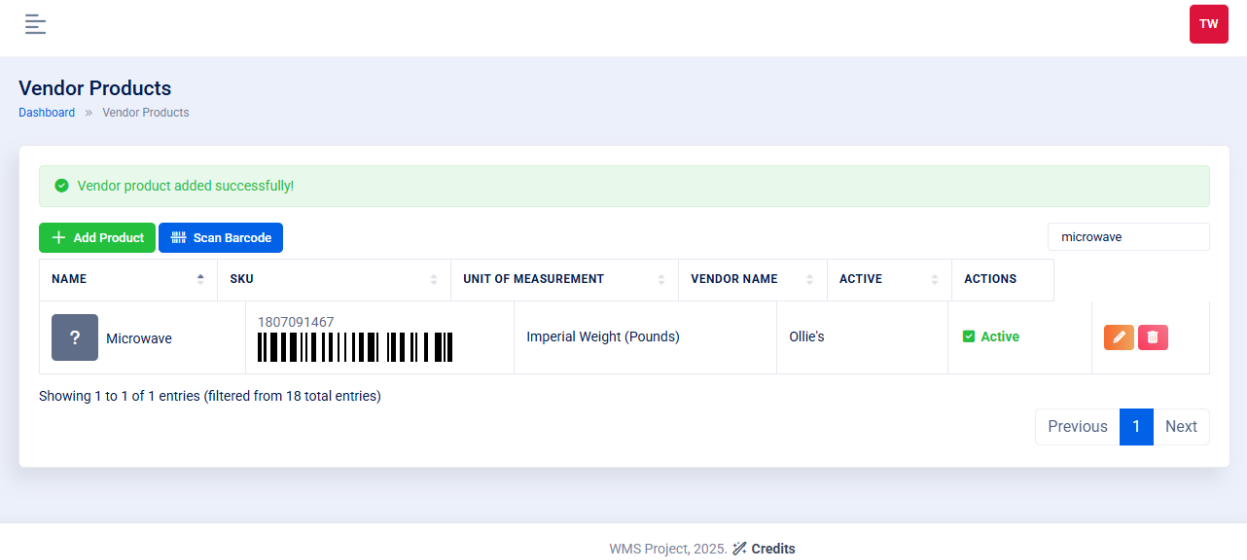
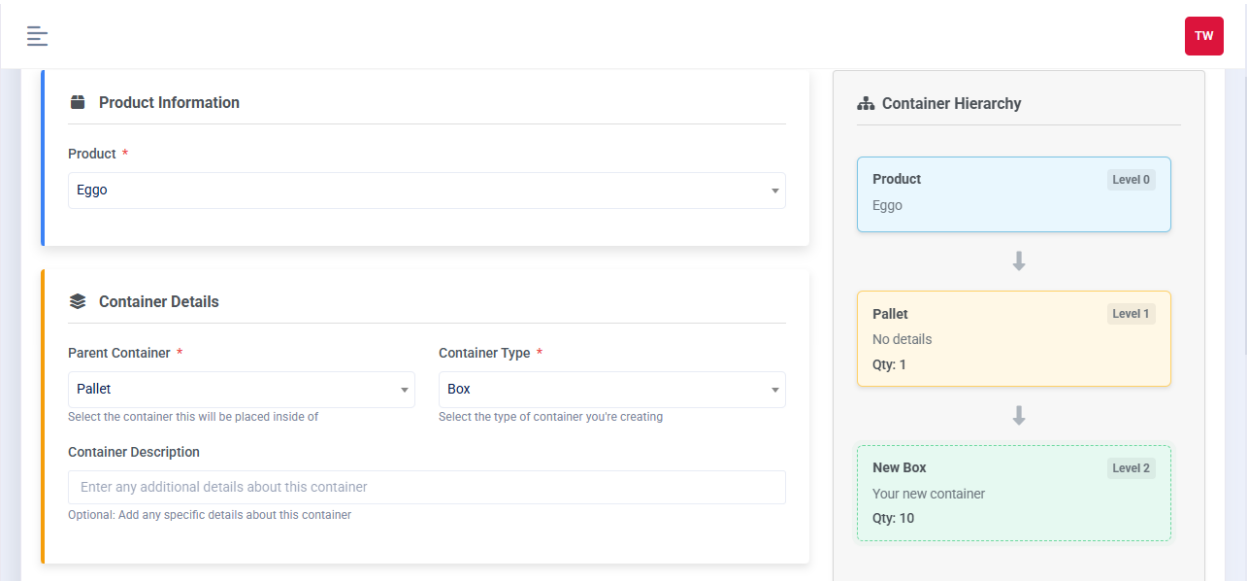


Figure 5.4(b) Vendor products page

5.5 Purchasing Manager Vendor Containers



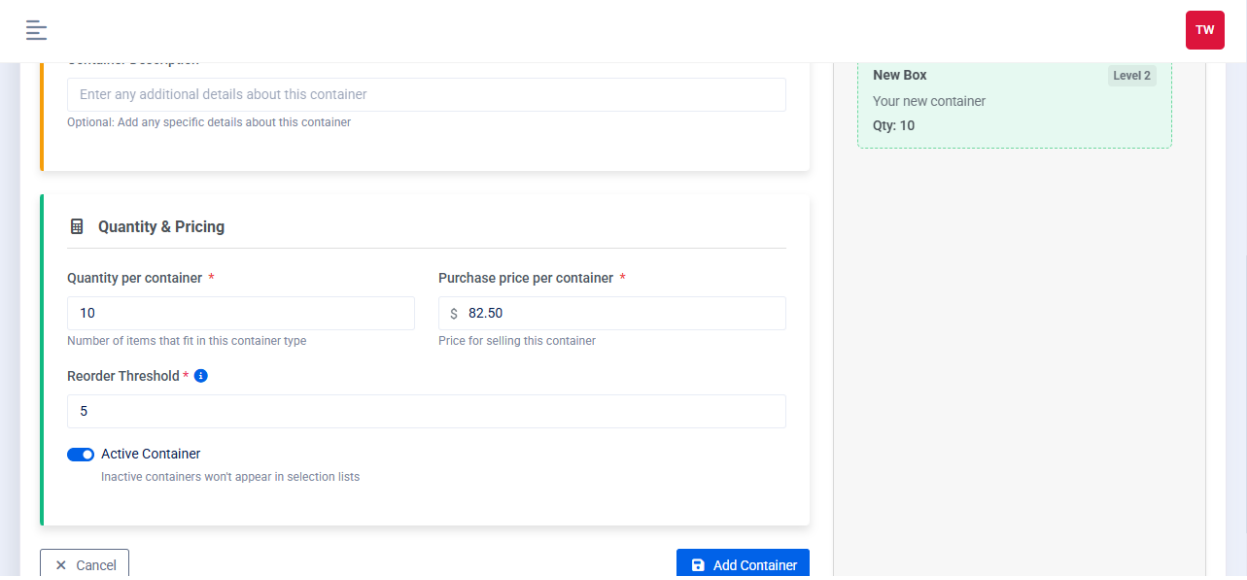


Figure 5.5 Purchasing manager vendor containers add page

The purchasing manager now must put products into containers to make the correlation between the product, its price and the container that the warehouse will be receiving. Figure 5.5 shows how to make a product container by requiring the user to input the product, the container type quantity, price and reorder threshold. On the right-hand side is the systems visual container hierarchy to help users visualize the containers. These products containers will be how the warehouse orders products on its purchase order page.

5.6 Purchasing Manager Orders

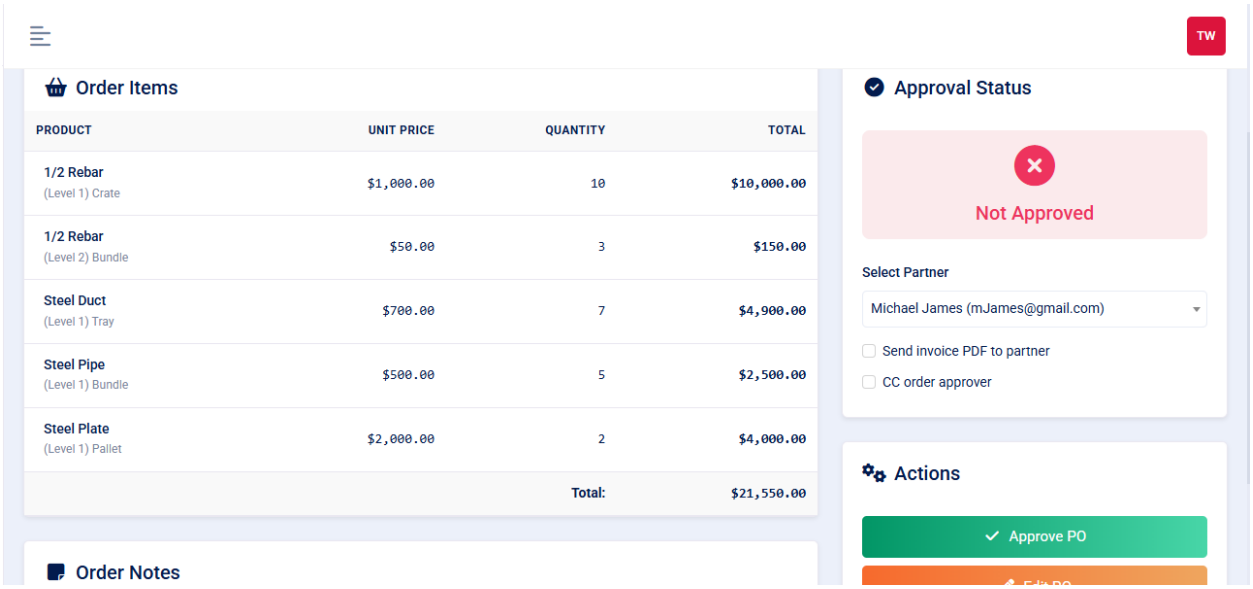


Figure 5.6 Purchasing managers invoice approval page

The purchasing manager also deals with purchasing orders which you can refer to figure 4.3 for that page. One that page the user will choose a vendor, pick the products the warehouse needs and the quantity. After all data is entered the order can be submitted and the purchasing manager needs to approve the order. Figure 5.6 shows the purchase orders invoice where the manager can approve the order.

5.7 Purchasing Orders

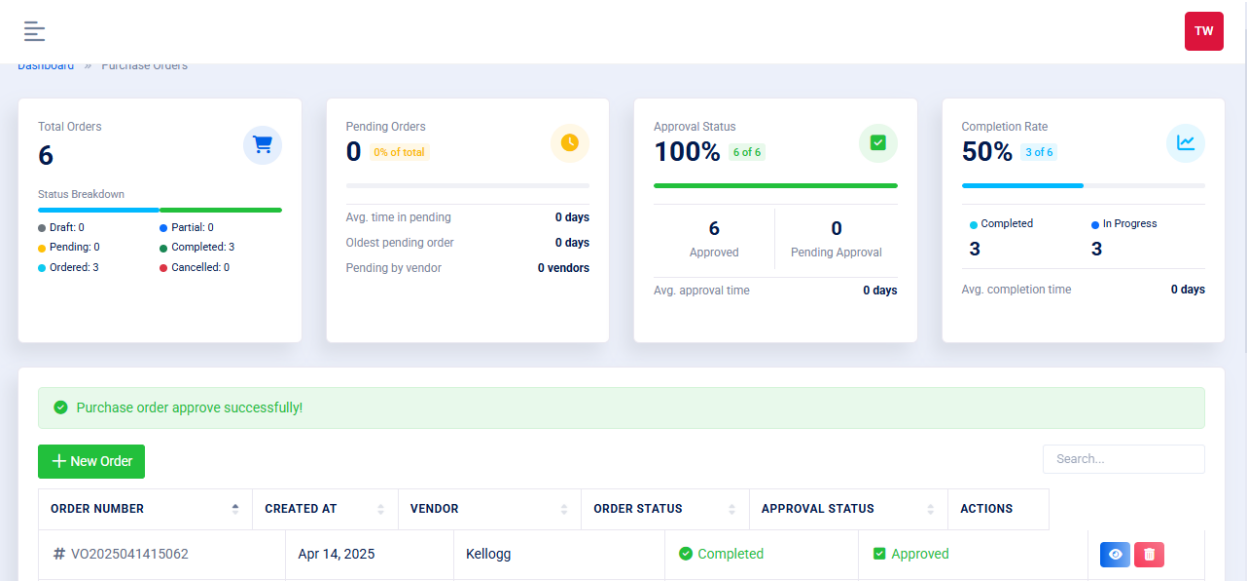


Figure 5.7 Purchasing orders base page

Figure 5.7 is the base page of purchasing orders. This page has special cards to demonstrate the status of orders, total orders, pending orders and completion rate. These are just small amounts of information the user can use to infer what to complete next. This page is how the purchasing manager gets to the purchasing orders invoice to approve orders as shown in figure 5.6.

Purchasing Manager Conclusion

The purchasing manager also has access to the customer catalog and container which look like the vendor pages, but since a purchasing manager does not directly work with customer products, they can only view the pages.

Shipping & Receiving Manager

A shipping and receiving manager oversee the critical entry and exit points of goods, essentially managing everything that comes into the warehouse and everything that goes out. Their role is hands-on, fast-paced, and central to keeping warehouse operations running smoothly and on schedule.

6.1 Shipping & Receiving Manager

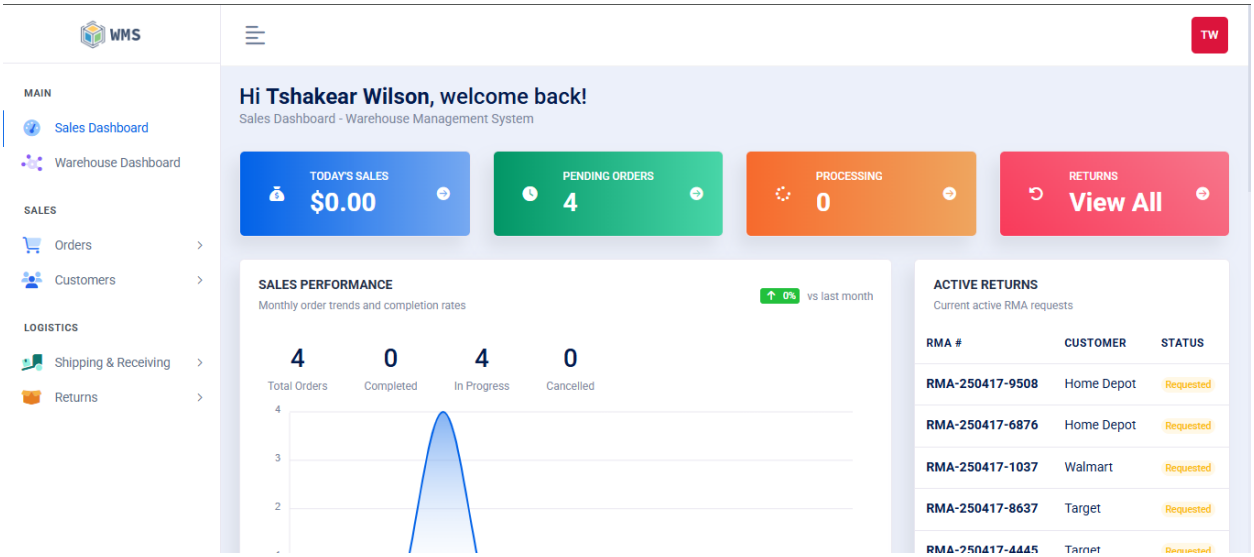


Figure 6.1 Shipping & receiving manager dashboard

A shipping and receiving manager will have access to orders which include customer orders, customers, shipping & receiving being incoming and outgoing shipments and returns. For returns the user can refer to figure 4.4 and 4.7, these figures show both returns. Incoming and outgoing shipments can be seen in figures 3.4(a) and 3.5(a), demonstrating the process of incoming products and the picking and packing process for customer orders.

6.2 Customer Orders

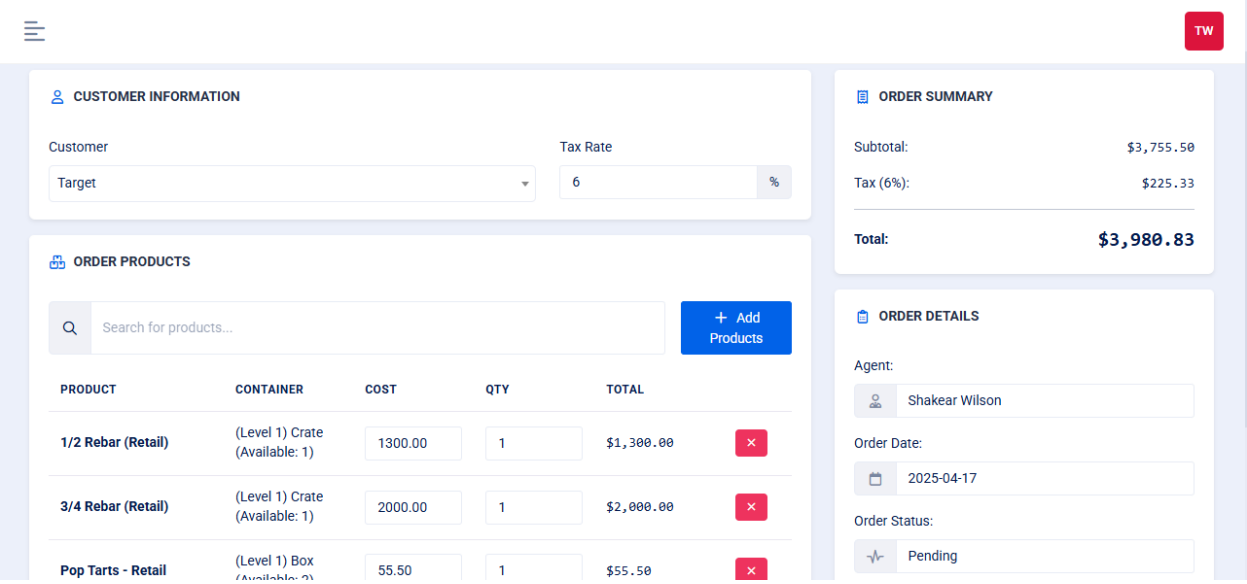


Figure 6.2 customer orders add page

Figure 6.2 shows how a customer order will be processed. The data needed to complete a customer order is the customer that the manager is sending the products to, the tax rate and selected products that are in the warehouse's inventory that the customer wants, the manager then applies a status to the order and submits it to be picked and packed for shipping.

6.3 Customer Invoice

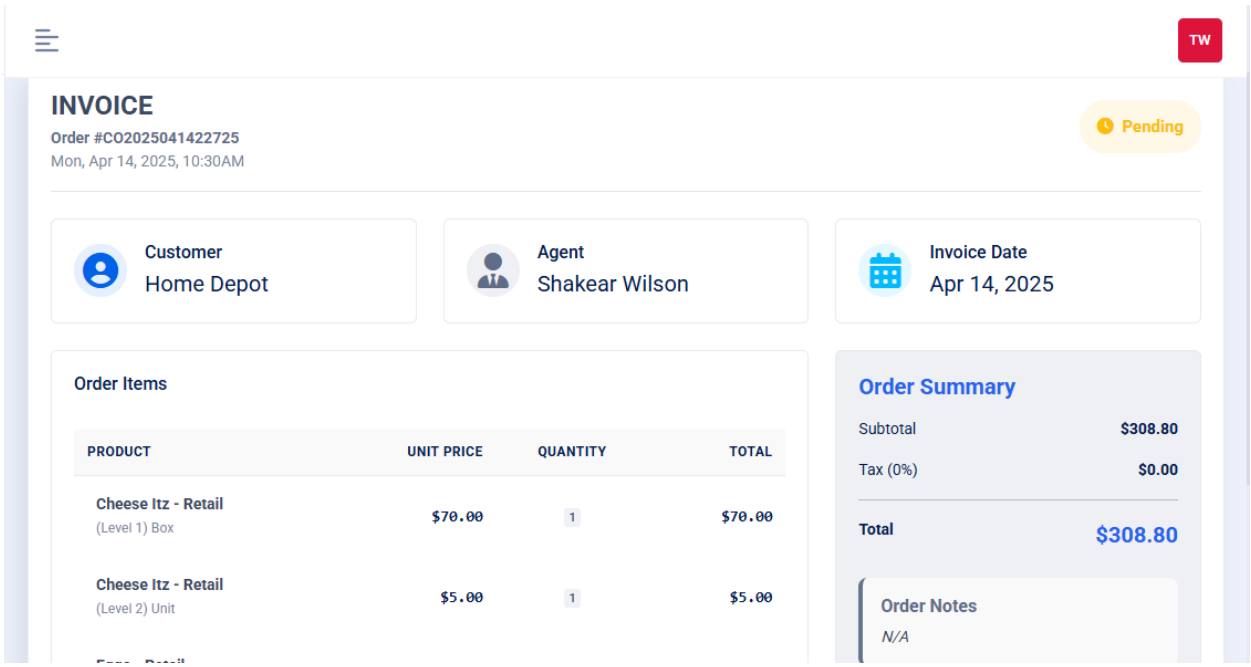
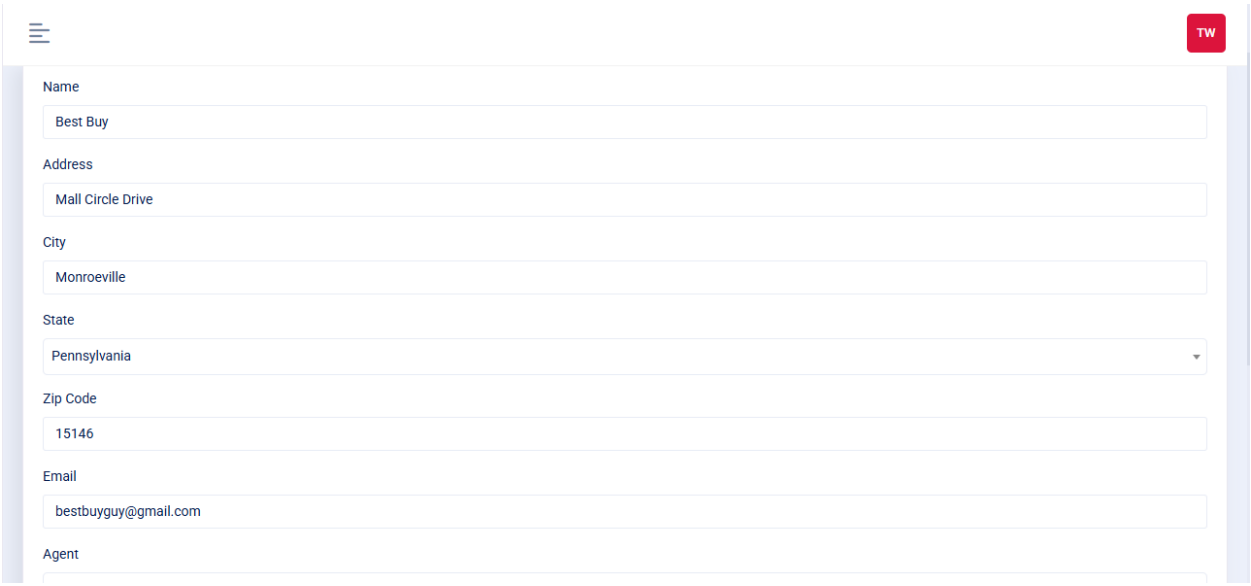


Figure 6.3 Customer invoice page

This page holds general information about the customer's order and can be accessed by the shipping & receiving manager. The information on the page consists of the order number, the agent that made the order, the ordered items and an order summary.

6.4 Customers



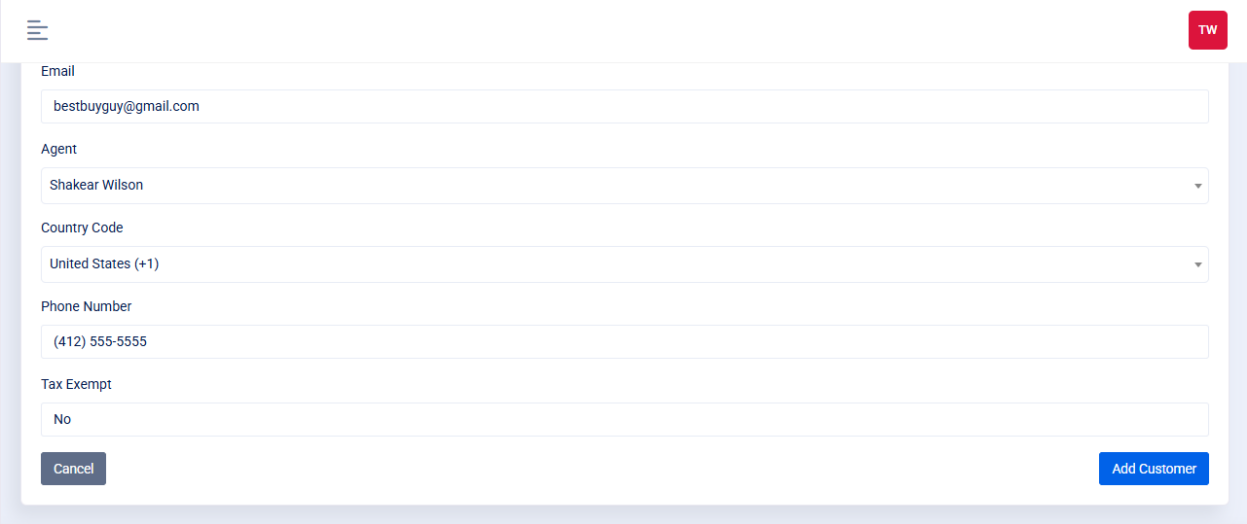


Figure 6.4 Customer's add page

Figure 6.4 shows the page where the shipping and receiving manager will create customers that the warehouse will have connections with selling products. The required information for a customer is their name, address, city, state, zip code, valid email address and phone number, an agent and if the business is tax exempt.

6.5 My Customers

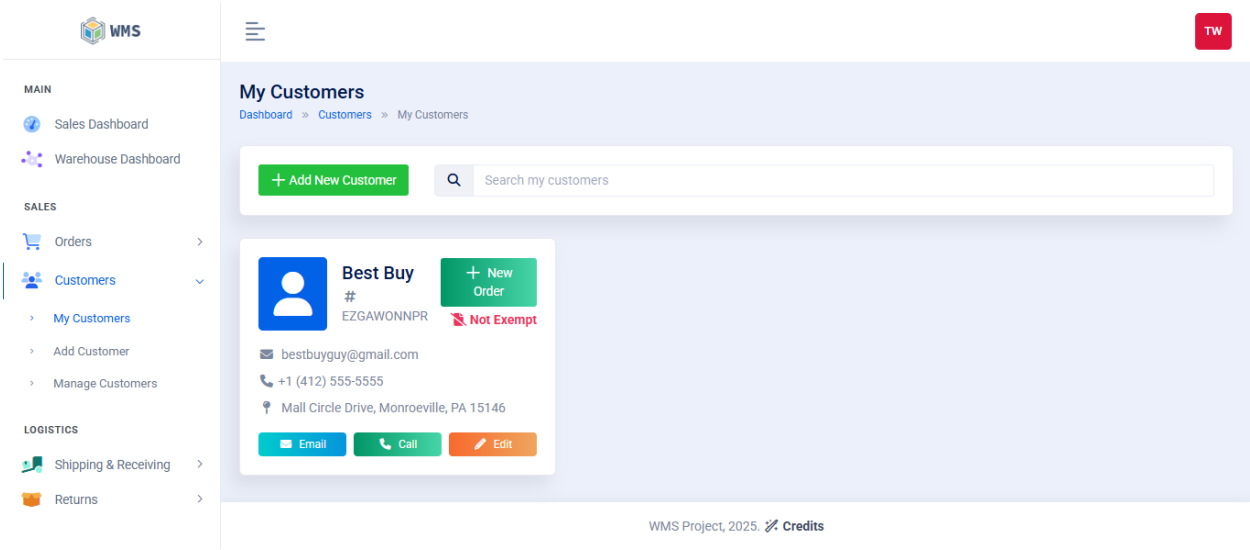


Figure 6.5 My customer's page

As shown in figure 6.4 the customer was added and now can be viewed on my customers page or the manage customers' page shown in figure 6.5. This page can be used for the manager to contact their customers about upcoming products and sales.

Customer service representative

A Customer Service Representative manages order-related concerns, answers questions, and handles product returns. Their main responsibilities are focused on resolving customer problems, guaranteeing accurate order handling, and assisting with customer return authorizations when needed.

7.1 Customer Service Representative

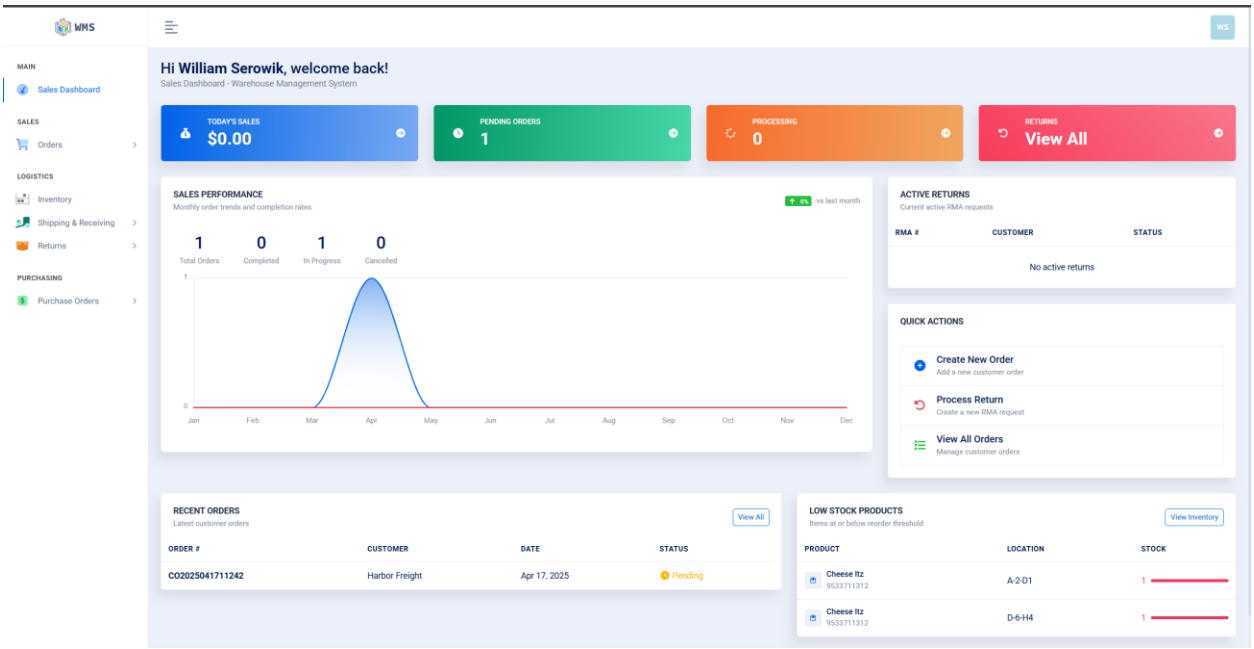


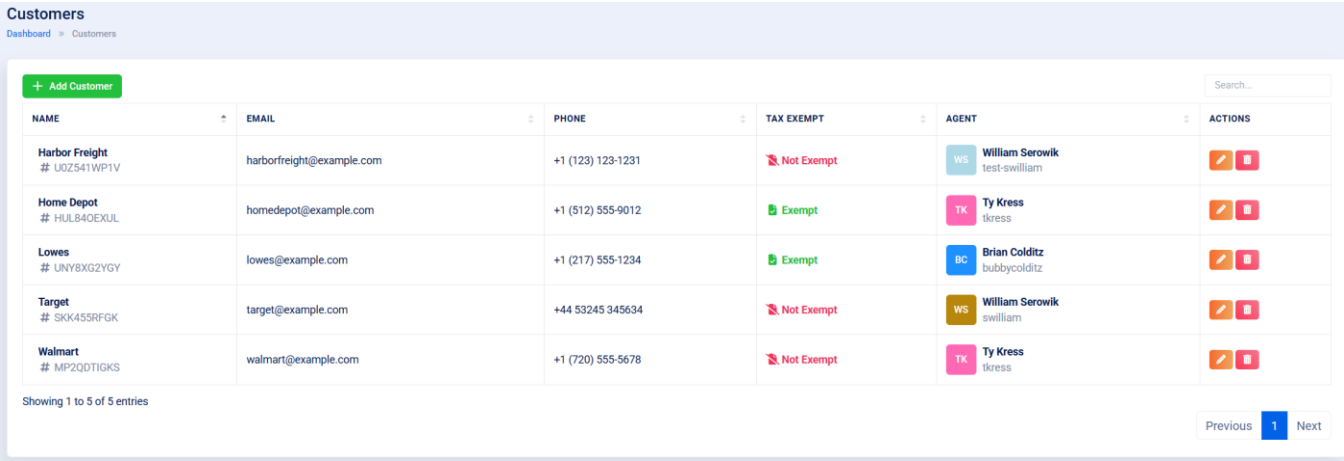
Figure 7.1 Customer representative's dashboard

Customer representatives have access to a limited number of pages necessary to handle customer operations. These include orders, customers, and returns. These permissions allow the Representative to review customer orders, manage return processes, and aid customers without access to the inventory or shipping workflows.

7.2 Customer service Representative – Orders

As seen in figure 4.3 and 4.6 the representative can view order details such as status, products, quantities and any shipment details. They can use filters and a search function to quickly locate specific orders. While they cannot edit orders, they can provide updates or report issues to the fulfillment team.

7.3 Customer service Representative – Customers



In figure 7.3 This page provides a list of registered customers in the system. It includes relevant details like company name and contact information. CSRs can access a customer's profile to assist with questions, view purchase history, and help start the return process if needed. They only have permissions for data review and not modifications

7.4 Customer Service Representative – RMAs (Return Requests)

In figure 4.4 you can see the processes for starting returns on customer orders. The information needed on this page is the product, the quantity, reason, reimbursement type, and additional customer notes. CSRs can either approve, reject, or leave as pending based on the warehouse's return policy. Status Chages are logged, and customers can be notified accordingly. The representative plays a key role in closing the feedback loop between the customer and warehouse

Customer Service Representative Conclusion

The representative does not interact directly with the physical inventory, locations, or purchase orders. Their role is strictly digital, and customer focused, access is limited mostly view only for most data. With some form-based inputs where customer action is required (such as return approvals). This design keeps customer information secure while giving the Representative the tools needed to support cases, returns, and inquiries accurately.

Sales Agent

A sales agent in a warehouse plays a critical role in the sale of products from the warehouse inventory to customers. While they aren’t usually involved in the physical handling of inventory on the warehouse floor, their work directly influences everything from inventory levels to customer relationships, lead times, costs, and earnings.

8.1 Sales Agent

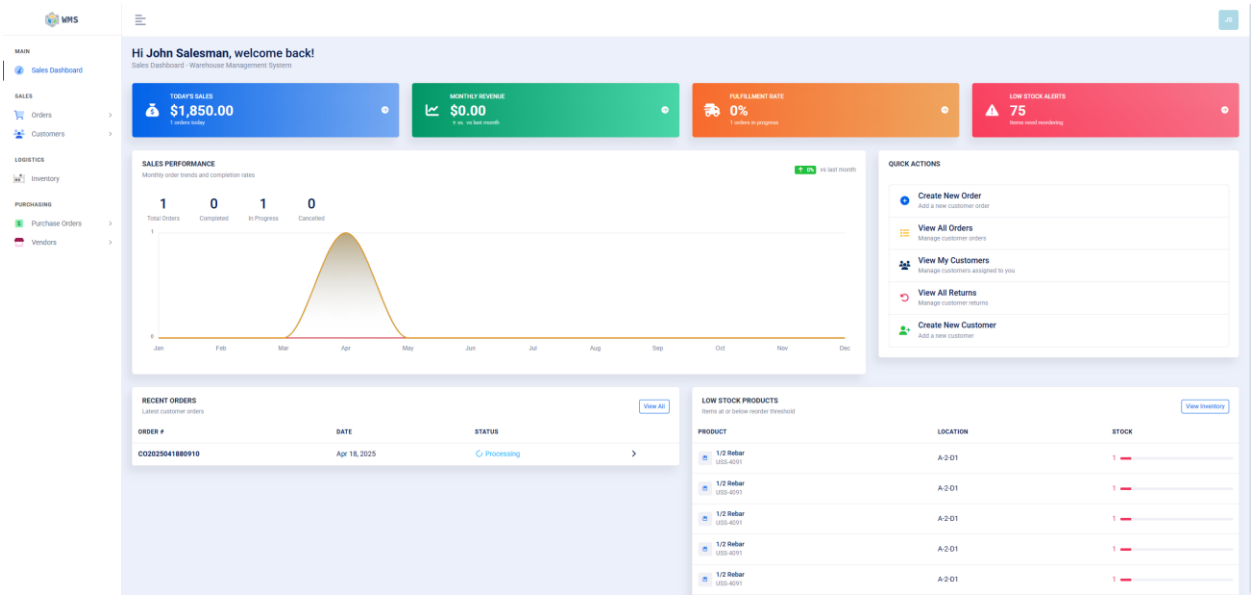


Figure 8.1 Sales Agent Dashboard

Figure 8.1 displays all the core pages that a sales agent would access. Sales agent permissions include the dashboard, orders, customers, limited access to purchasing orders, vendors, and inventory. These tools allow the sales manager to effectively oversee sales activity, manage customers, and ensure product availability. The dashboard provides real-time summaries of key metrics such as active orders, completed sales, customer activity, and inventory alerts. As shown in figure 8.1, the cards display high-level information that helps sales agents prioritize tasks and identify where follow-up may be needed.

8.2 Sales Agent's Customers

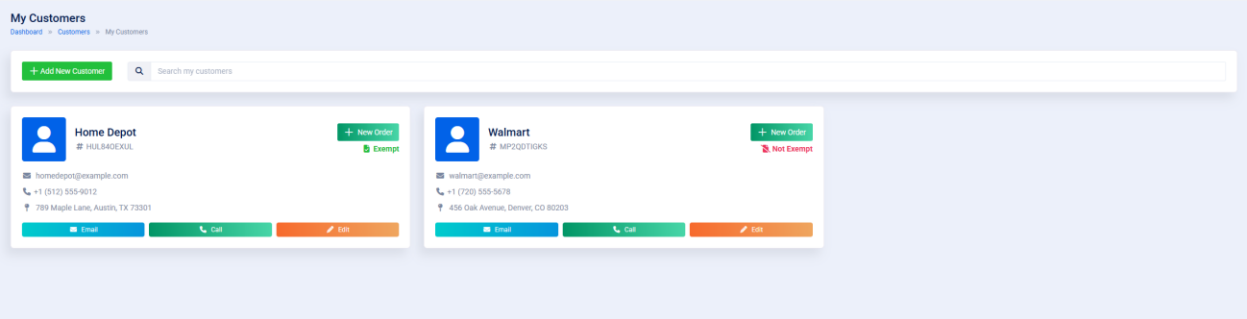


Figure 8.2 Sales Agent My Customers Page

Figure 8.2 shows the view page for customers. This searchable tile list displays key details like contact info, address, and tax status. It helps the sales agent manage their customer relationships and respond to inquiries more effectively.

8.2(b) Sales Agent Add Customers

Figure 8.2(b) Sales Agent Add Customers Page

Sales agents are responsible for onboarding new customers. In figure 8.2(b), a new customer can be added by entering fields such as name, email, phone, billing and shipping addresses, and company name. Once submitted, the customer becomes selectable when creating new orders.

8.3 Sales Agent Customer Catalog

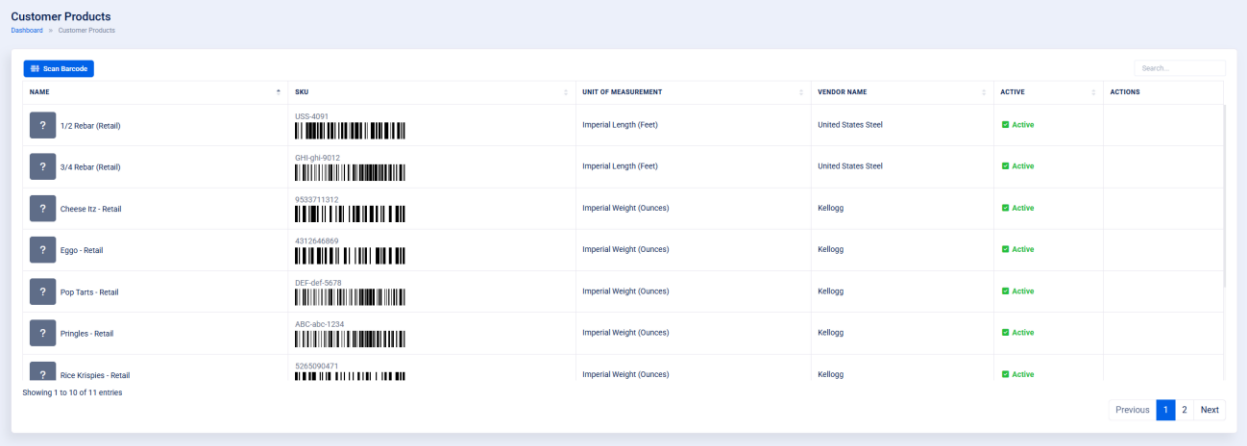


Figure 8.3 Sales Agent Customer Catalog Page

Figure 8.3 displays the page that allows the sales agent to browse and review products available to each customer. Products are organized by categories and customer-specific offerings. This helps ensure the sales agent only offers valid SKUs to each client. Inventory availability is also visible on this page

8.3(b) Sales Agent Customer Container

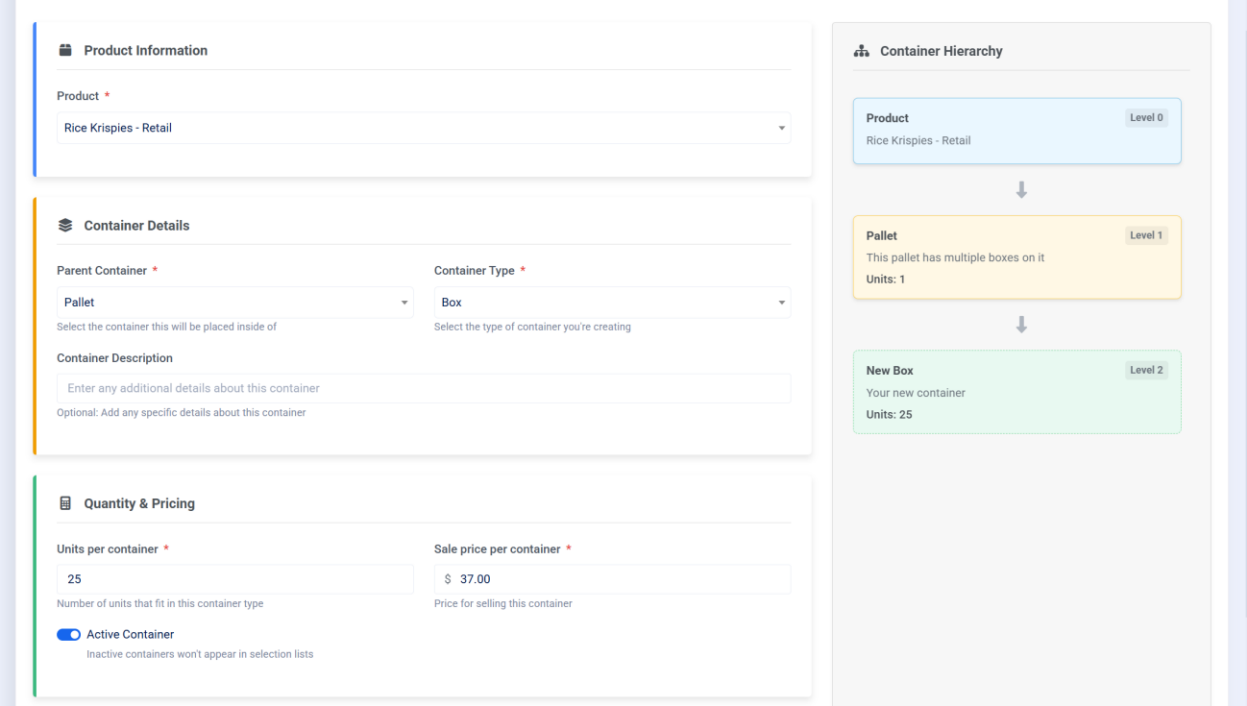


Figure 8.3(b) Sales agent customers container add page

In figure 8.3(b) shows how the sales agent would create new customer containers for customers to order from. These containers will differ from vendor containers as these are the containers that the warehouse will be using to sell products in. The customer then can buy the product based on the containers available for that product.

8.4 Sales Agent's Inventory View

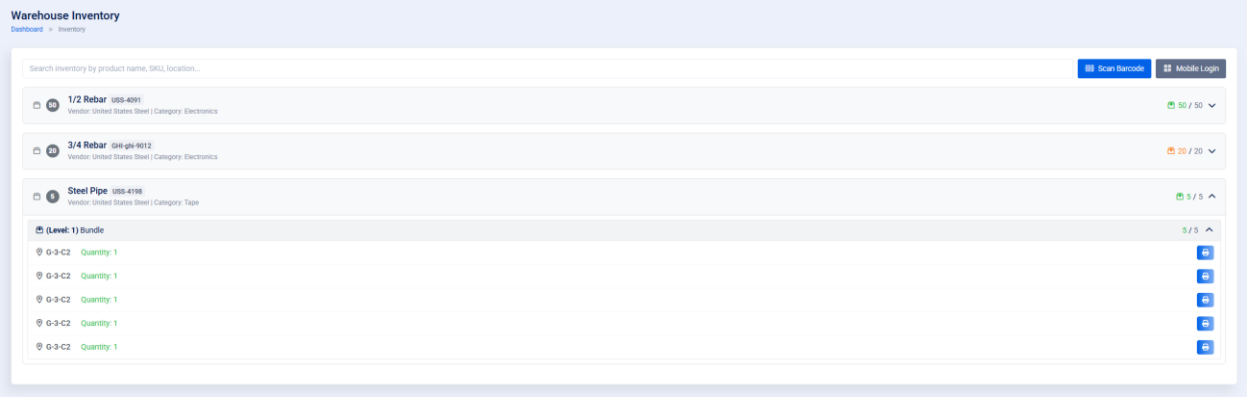


Figure 8.4 Sales Agent Inventory View Page

Though sales agents do not control warehouse stock levels, they need to verify inventory availability when creating or reviewing orders. Figure 8.4 shows a read-only view of inventory levels across all products, including quantities on hand and reorder thresholds. This allows for more accurate order placement and customer service.

8.5 Sales Agent View Orders

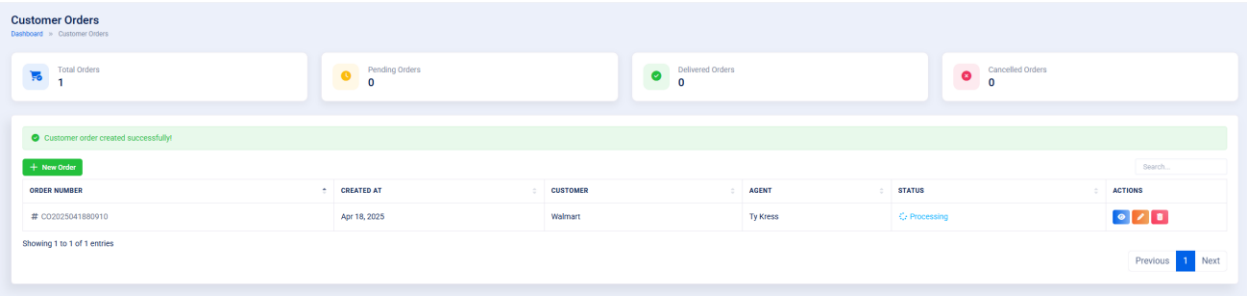


Figure 8.5 Sales Agent View Orders Page

Figure 8.5 displays the sales order view page, which provides a searchable list of all orders created by the agent or team. Sales agents can review statuses, shipping progress, and

order totals. This view helps with follow-ups and customer communication regarding current and past orders.

8.5(b) Sales Agent Add Orders

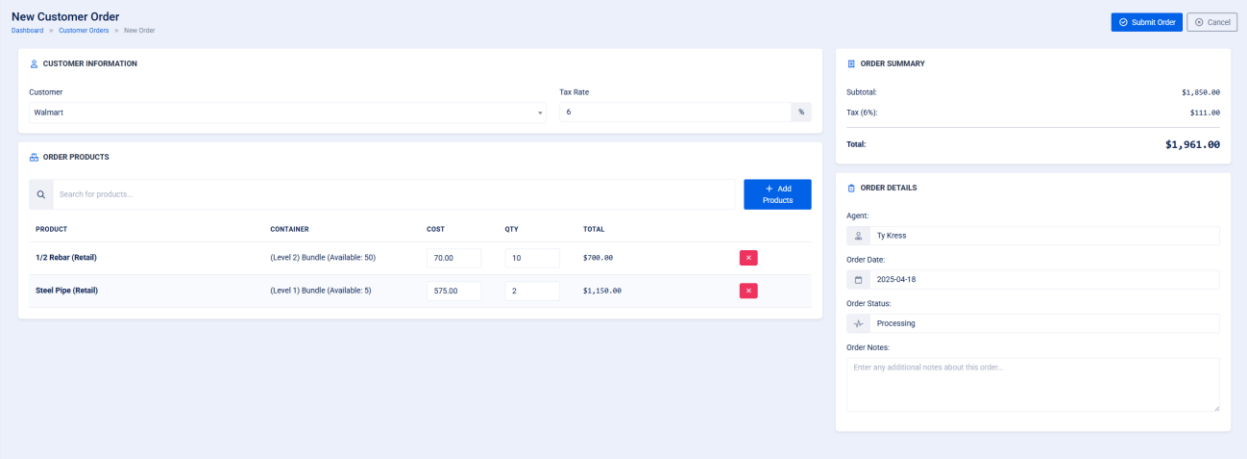


Figure 8.5(b) Sales Agent Add Orders Page

Sales agents are responsible for creating and managing sales orders. In figure 8.5(b), the agent selects a customer and chooses from available inventory. The system allows them to enter product quantities, pricing (if applicable), and additional order notes. Once submitted, the order appears in the order history, and its status can be updated as it progresses through fulfillment.

8.6 Sales Agent Vendors

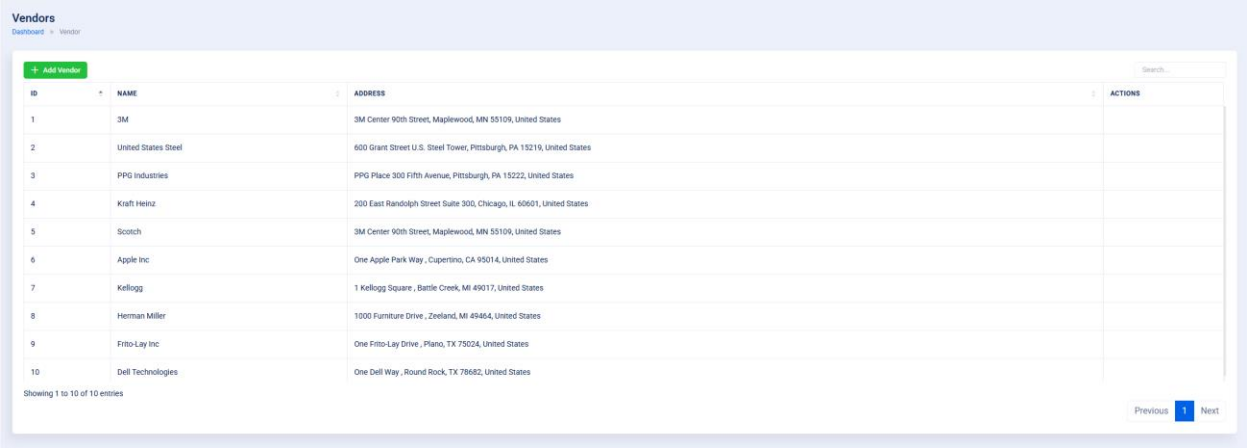


Figure 8.6 Sales Agent View Vendors Page

Sales agents have read-only access to vendor information. Figure 8.6 displays a basic vendor view showing names, contact details, and associated products. This information can assist in communicating product details to customers or coordinating with purchasing when stock needs to be replenished.

8.7 Sales Agent View Purchase Orders

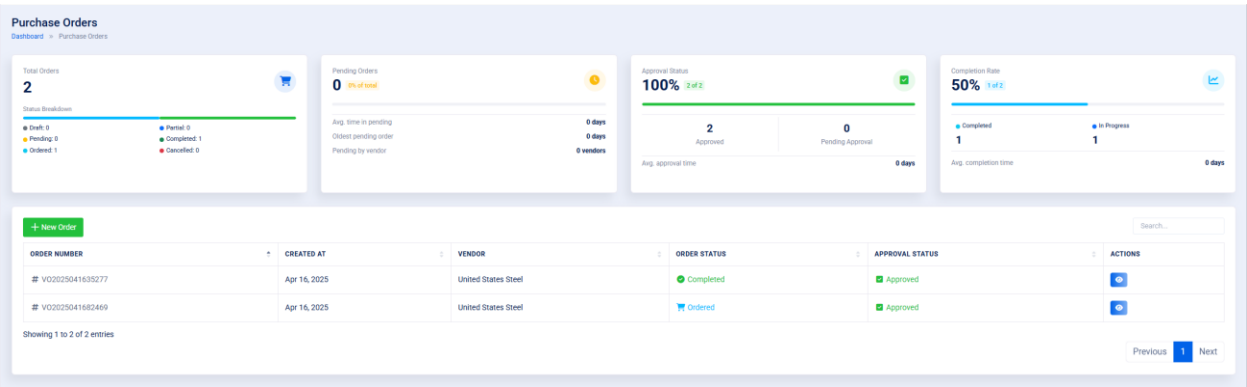


Figure 8.7 Sales Agent View Purchase Orders Page

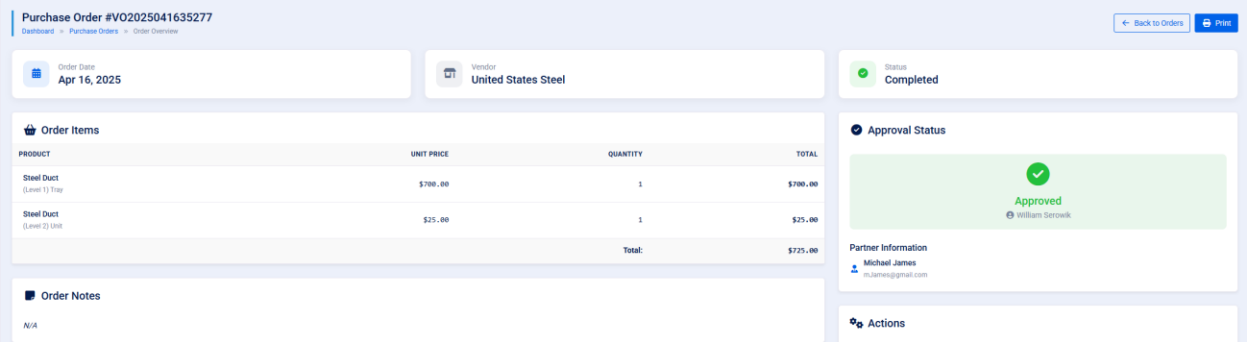


Figure 8.7(b) Purchase Order Overview

Sales agents can also view purchase orders to track incoming stock and estimated delivery dates. As seen in figure 8.7(b), they can check vendor names, items ordered, quantities, and statuses. This page is for viewing only, helping sales agents manage expectations and update customers accordingly.

Sales Agent Conclusion

The sales agent is essential to the customer's experience within the warehouse system. With access to customer and order creation tools, and visibility into vendors, inventory, and purchase orders, they can provide fast, accurate service. Their role bridges customer interaction and warehouse readiness, ensuring a smooth sales pipeline.

Warehouse Manager

The warehouse manager’s role includes access to all the permissions and pages of the roles previously mentioned, see figure 9. In addition to the pages laid out previously, the warehouse manager has access to view User’s information.

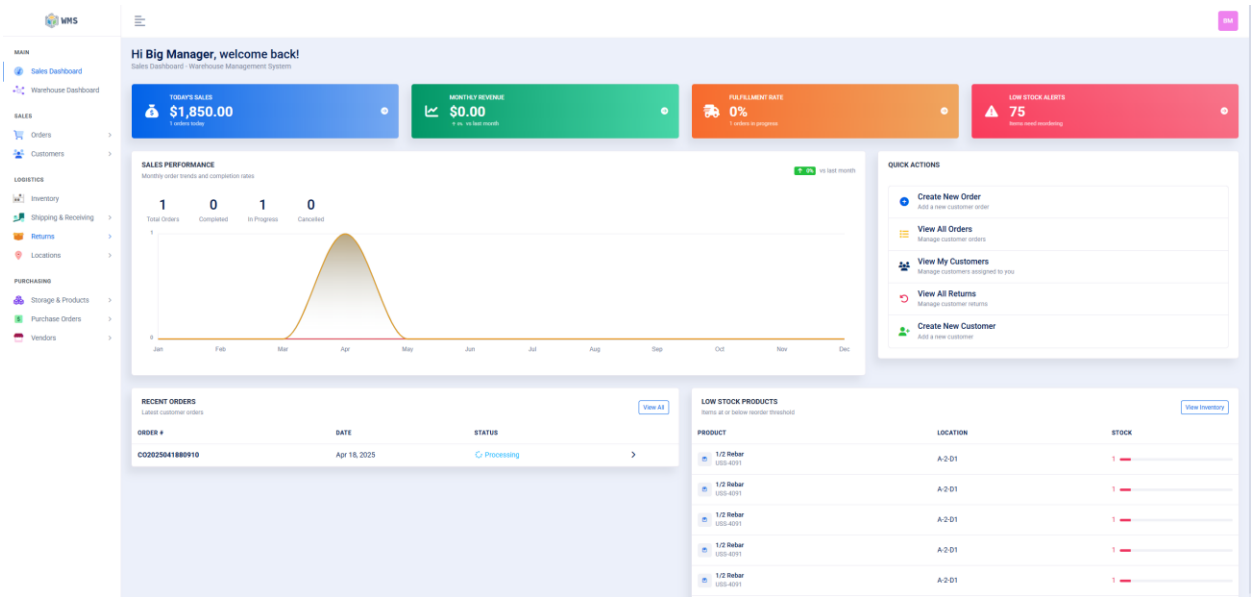


Figure 9 Warehouse Manager Dashboard

9.1 Warehouse Manager Users

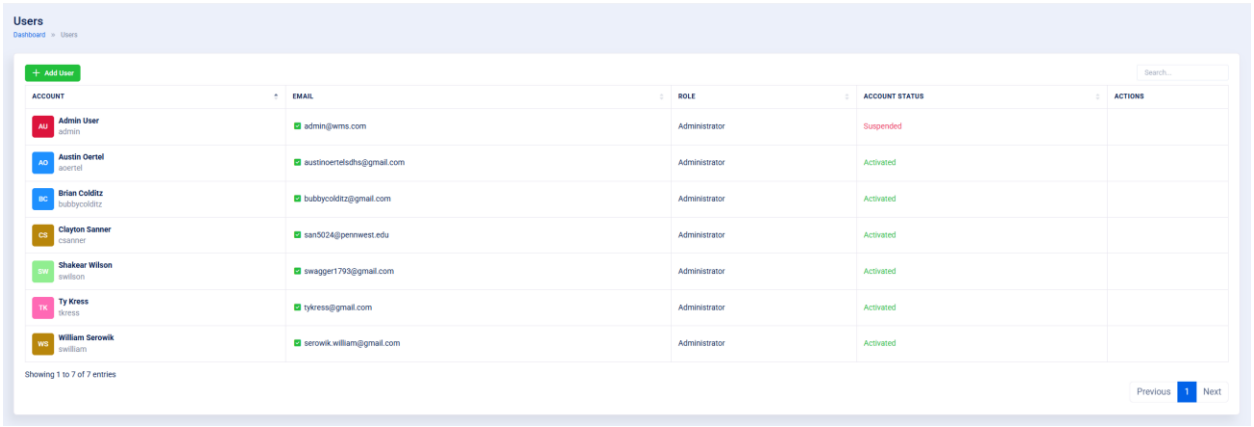


Figure 9.1 User View Page

Warehouse managers have read-only access to user accounts within the system. Figure 9.1 shows a list of users and their associated roles. This allows the manager to verify who is

assigned to various responsibilities, helping them coordinate across departments more efficiently. However, user roles and permissions cannot be edited by this role.

Warehouse Manager Conclusion

The warehouse manager has the broadest operational access in the system, acting as the bridge between roles and ensuring all departments—from sales and customer service to receiving and inventory—operate in sync. With control over locations, audit cycles, and cross-department reports, the warehouse manager is positioned to oversee efficiency, accuracy, and daily execution across the facility.

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Table of Index / Glossary

AJAX - stands for Asynchronous JavaScript and XML. It is a set of web development techniques using various technologies to create dynamic web applications

Apache – A widely used open-source web server software that helps deliver web content to users.

Docker – A platform that uses containers to run applications in isolated environments, ensuring consistent functionality across systems.

Location – A specific storage space in the warehouse defined by rack, bay, level, and position.

Mobile Login – A feature that allows warehouse associates to log in to the system using mobile devices for flexibility and efficiency.

PHP – The main programming language used in this system to manage server-side scripting and database interaction.

QR (Quick response) - a two-dimensional barcode that can be scanned with a smartphone to access information.

RMA (Return Merchandise Authorization) – A process that tracks and approves product returns from customers or to vendors.

RBAC (Role-Based Access Control) – A system of assigning permissions to users based on their job responsibilities.

SKU (Stock Keeping Unit) – A unique code or number used to identify individual products.

Appendix: Team Details and Individual Contributions

The work shown was distributed among group members who developed the Warehouse Management System with this document being led by Shakear Wilson. This document was started in the final phases of the project and was completed alongside the implementation of the software for our system. Each member of the team completed their section as well as helped to add to other members' sections. The document was created by all the following individual efforts:

Brian was responsible for Project overview and application, system block diagram, Project implementation details, team details along with the user's manual for this document. During the implementation phase of this project Brian was the leader in the group and helped develop web pages, tables for the database, the implementation of functionality and logic in our system, security/error checking web pages, the development of RBAC, educating group members on coding languages being used & best practices, and optimizing code.

Ty was responsible for Project overview and application, system block diagram, user's manual, team details, challenges during implementation and the Glossary for this document. During the implementation phase of this project Ty helped in developing the functionality of many web pages, the implementation of functionality and logic in our system along with handling weekly reports.

William was responsible for Project implementation details, system block diagram, user's manual, challenges during implementation and motivation for this document. During the implementation phase of this project William helped in developing the functionality of many web pages, security/error checking web pages, the implementation of functionality and logic in our system and development of RBAC.

Shakear was responsible for project overview and application system block diagram, use of software engineering principles, difference from design document, comparison to existing similar products user's manual, challenges during implementation, team details and motivation for this document. During the implementation phase of this project Shakear helped in developing the functionality of many web pages, the implementation of functionality and logic in our system.

Other contributions that were coordinated by group members consisted of:

- Discord meetings/discussion
- In person discussion
- Formatting and planning outline of document
- Meeting at Writing Center
- Feedback and Proofreading

Appendix: Writing Center report

The following notes related to your 4/18/2025 2:30 – 3:00 PM EDT appointment with Addison Wonak:

I went over the manual to see if there were any big changes to be made, or anything else that stood out to me. Mostly I focused on the formatting, adding comments to the paper about its consistency in font sizes, and placements of the headlines. I also looked at the table of contents, and how the outlines of information were spread out in the paper.

Appendix: Code listing

Appendix: Workflow Authentication

I, Brian Colditz, agree with the details defined in this document that represent functional requirements of WMS. Also, I agree that the work that was done as stated by this document

Signature: Date: 4/18/2025

I, Ty Kress, agree with the details defined in this document that represent functional requirements of WMS. Also, I agree that the work that was done as stated by this document

Signature: Date: 4/18/2025

I, Shakear Wilson, agree with the details defined in this document that represent functional requirements of WMS. Also, I agree that the work that was done as stated by this document

Signature: Date: Date: 4/18/2025

I, William Serowik, agree with the details defined in this document that represent functional requirements of WMS. Also, I agree that the work that was done as stated by this document

Signature: Date: 4/18/2025