

Application to Connect the Stock, Suppliers, and Deliverers via Inventory Management System

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ABSTRACT

IPax is a 200-person IT firm situated in Sri Lanka. Due to the huge number of personnel, the decision was made to keep this inventory management system. Within the organization, employees require certain products for everyday usage. By generating orders through the system, employees may request from the warehouse manager the things they want. After an order has been created, the warehouse manager can see it as an order. If the requested item is in stock, the stock manager can accept and forward the request to the employee. There are several vendors that furnish the organization with the necessary products. When the warehouse manager changes the status of the order to "placed," the corresponding supplier is instantly notified and given the option to accept or reject the request. The warehouse manager is responsible for managing the available inventory and received inventory for each item that is purchased. This study can aid "IPax" in order to improve the company's manufacturing service level. Consideration of inventory simulation is advocated for the establishment of various supplier demand management scenarios.

Keywords— Inventory Management, Warehouse Manager, Warehouse, Simulation, Establishment

I. INTRODUCTION

At the time that this article is being written, a large number of businesses are transitioning to a variety of online platforms in order to replace their physical establishments, which have been closed as a result of societal constraints brought on by the coronavirus epidemic. The explanation for this may be found in the reaction that businesses have had to people's shifting consumption patterns. A growing number of consumers are ditching traditional in-store shopping in favor of purchasing products and food online [1].

On the other hand, poor inventory management procedures can, over time, lead to a loss of income for small enterprises. The management of inventory is an overall notion that incorporates all aspects of the product or service's life cycle, including the phases of procurement, storage, and production. The range is more

extensive given that it regulates everything. Everything is covered by inventory management, beginning with the warehouse and continuing all the way through the sourcing of the materials and the final destination of the product [2].

Despite this, a method of inventory management that is as complete and standardized as the one employed by large organizations is not appropriate for companies. Database software packages like Microsoft Access, which are very affordable, are a viable option for organizations looking to manage their inventories in an efficient manner [3].

Software like MS Access [4], which is not very costly, could not perform as well. Having a business assist it manage its inventory, on the other hand, is sufficient in order to make successful judgments about inventory management. This research intends to give a corporation with a workable database architecture that will lessen the amount of trouble it has with inventory management. The suggested database is intended to help remedy the inventory issues that a firm known as IPax has been experiencing. The results of this study will assist businesses in more effectively managing their inventories. They are able to verify inventory more quickly with the help of the recommended database software since they manage their firms themselves. If the owner of the company could keep track of what things they had in stock, it would be to their advantage. These business owners will also be able to lower the expenses associated with their inventory and set delivery orders that are more strategically sound in order to replace their stock.

II. RELATED WORKS

Whole blood, packed erythrocytes, liquid plasma, fresh frozen plasma, platelet concentrate, cryoprecipitate, and cleaned erythrocytes improve Indonesian healthcare in the blood transfusion unit. This company must balance blood supply information with consumer demand to provide customers. Blood inventory management was challenging in this facility. This study uses the systems development lifecycle to describe an information system to regulate blood demand. Safety

stocks, reorder points, and order amounts for all blood components were implemented using a continuous verification model. This study can improve blood transfusion unit service. Blood inventory simulation is suggested for numerous blood demand management scenarios [5].

Many nations have taken swift steps to combat COVID-19. Many economic participants, including new start-ups, were shocked by the lockout of vast segments of society and industry. The study shows an entrepreneur suffering from inventory management and contrasts the current approach with the suggested database solution. This paper ends with a wireframe design to assist small businesses to communicate with customers [6].

This study presents data mining methods for ABC SKU categorization in a Thai factory's spare parts warehouse. ABC analysis uses "inventory categorization" to classify objects into three groups (A, B, and C) to identify data. SAP inventory management provided 2015–2019 statistics. 28 characteristics, 21,222 occurrences. Random forest, bagging, adaboost, dagging, and decorate process the dataset. This study compares the precision, recall, F-measure, and accuracy of five ensemble algorithms for industrial inventory management to identify ABC classification properly [7].

The number of people looking for water filling stations has grown steadily over the past few years. These smaller enterprises need to improve their efficiency in order to keep up with the growing demand. The purpose of this project is to investigate the feasibility of installing inventory management software at water refill stations so that business owners may more easily keep track of their possessions. A comprehensive interview was carried out in order to obtain the important data required for the development of the new inventory system utilizing the capabilities provided by the information system. An information system is a type of computer software that helps to organize and analyze data by transforming unprocessed data into information that can be used [8].

New technology have accelerated food business growth. To suit consumer requests, several product investigations have been done. Thus, several food additives were employed to build the product, making food additive stockpiles hard to identify and control. In a competitive environment, the industry must develop a viable inventory management solution since under-stocking misses sales opportunities and over-stocking creates a deficit. This article discusses inventory management and forecasting. A new inventory management system that manages and finds food additives in the Codex Alimentarius Commission-authorized International Food Additives Database uses the online service. Web services are superior to typical web bases. The consumer does not need to know the database access mechanism, and the service provider can alter the information or business model without updating the customer page. Any platform can access the service. HTML5, NodeJS, MySQL, and PHP were used to build the web service (PHP). Python used Naive Bayes,

Decision Tree, Linear Regression, and Support Vector Regression to predict food additive inventories. These methods are evaluated by accuracy. Linear regression was the best population forecasting model in the trial [9].

III. METHODOLOGY

Having a business help you manage your inventory, on the other hand, is adequate for making effective inventory management decisions. The goal of this study is to provide a company with a database design that will reduce its inventory management difficulties. The proposed database is meant to assist in resolving the inventory challenges that IPax has been encountering. The findings of this study will aid firms in managing their inventory more efficiently. Since they operate their own businesses, they can verify inventories more rapidly with the aid of the recommended database software. If the owner of the business could keep track of their inventory, it would be to their benefit. These business owners will also be able to reduce their inventory-related expenditures and create more strategically sound delivery orders to replenish their stock.

IV. RESULT AND DISCUSSION

This section shows the results of this study.

A. Function – 01

This function indicates, Stock related operations.

1) Sprint 1

Figure 1 will be used to create display the stocks. After clicking the Stock button in the navigation bar stock manager will be directed to this interface. In here he can see the details about the items in their stocks.

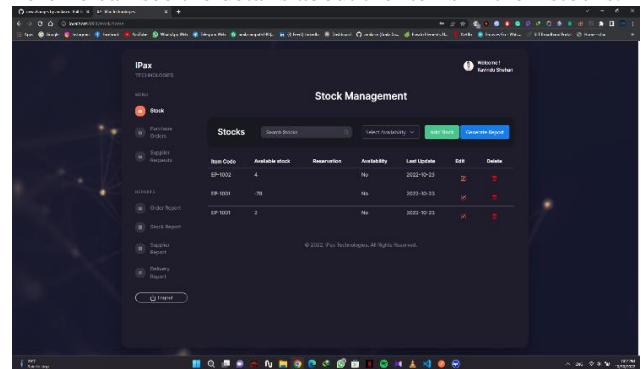


Figure 1: Stock Page

Figure 2 will be used to add stocks manually to the system. After clicking stock button, this popup interface will display. Then you can select the item, enter the quantity, and select the date. Then you must click the add button to add the stock to the system.

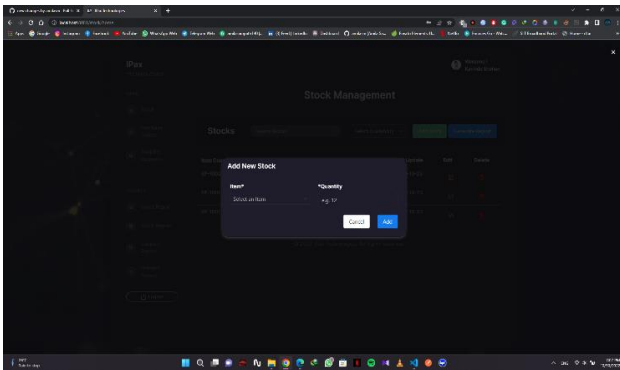


Figure 2: Add Stock Page

Figure 3 will be used to delete the stock from the system. The user must click the delete button in the table to delete the stock from the system. Then this popup will be prompted as shown here. Stock manager can cancel the delete procedure by clicking on the “cancel” button or confirm the delete by clicking on the “yes, remove it” button displayed.

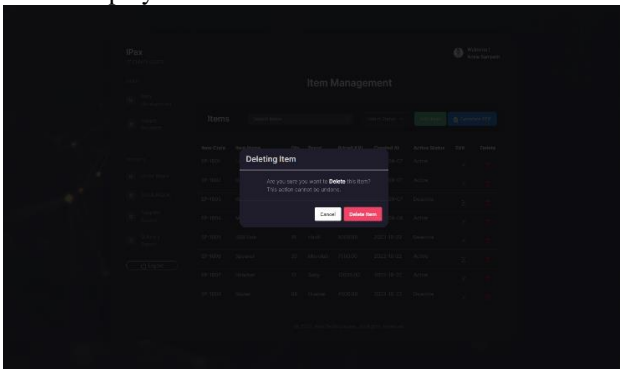


Figure 3: Delete Stock

2) Sprint 2

Figure 4 will be used to view the purchase orders and create a manual order by the stock manager. When user after clicking the order button on the side navigation, you will be directed to this interface. Radio buttons have used here to navigate and view the order details by their status.

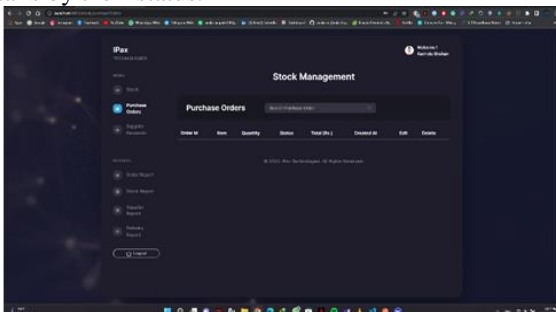


Figure 4: Purchase Orders Page

Figure 5 will be used to delete the purchase order from the system. After clicking the delete icon in the table, this popup will be prompted to make sure user want to delete the order from the system. Stock manager

can cancel the delete procedure by clicking on the “cancel” button or confirm the delete by clicking on the “yes, remove it” button displayed.

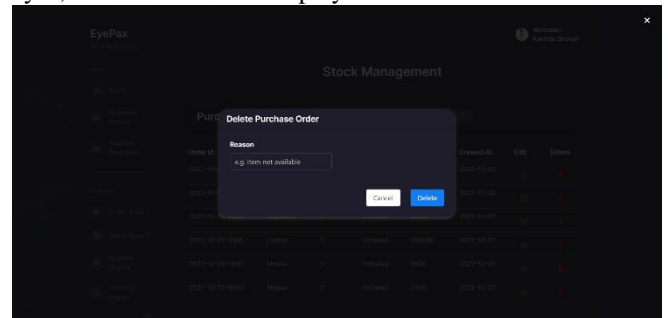


Figure 5: Delete Purchase Order

Figure 6 will be used to generate the reports by the purchase order details. After clicking the ‘Generate report’ button user will be directed to this interface, in here user can generate their reports by clicking the ‘Generate’ button according to their preference. User can select Year, Month, and Status from the dropdown and get the details.

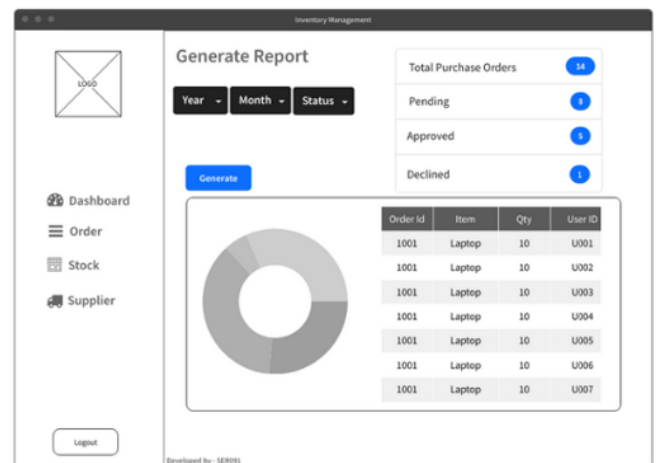


Figure 6: Generate Purchase Order Details

B. Function – 02

This function indicates, order related operations.

1) Sprint 1

If any user works in the company needs something from the company inventory, they must request the particular item by adding the order. Click the order tab from the side menu and navigate to the purchases page and click the button named “+Order” to add a new order. After filling all the fields user can click add button to finish the order.

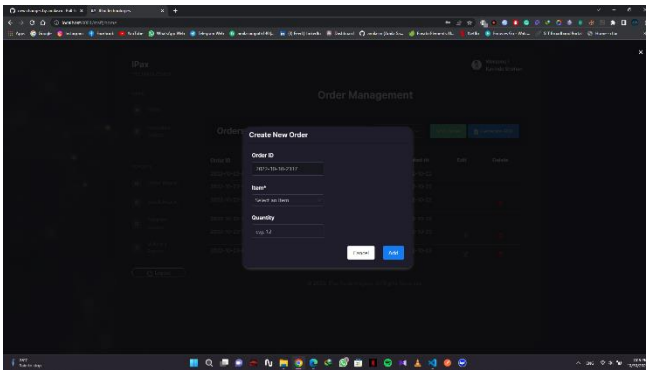


Figure 7: Add Order Page

User wants to update the requested quantity, he/she can update it by changing the quantity. Click the order tab from the side menu and navigate to the purchases page and click the edit icon of the order. After the modal opens user can edit the quantity and click the update button.

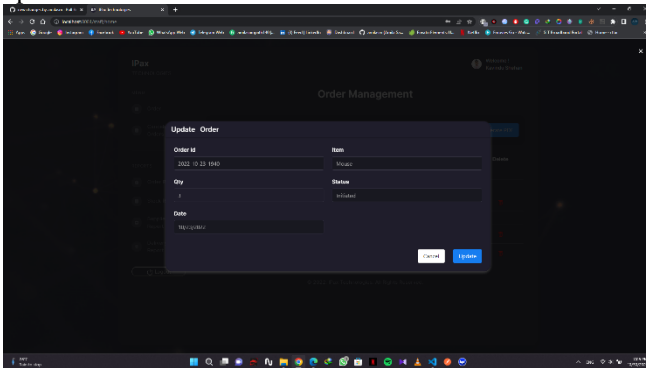


Figure 8: Update Order

User wants to view all created orders. Click the order tab from the side menu and navigate to the purchases page.

2) *Sprint 2*

User wants to view all created orders. Click the order tab from the side menu and navigate to the purchases page and click the delete button of the particular order. After the modal opens user has to give a reason for deletion and click the “Yes, remove it” button.

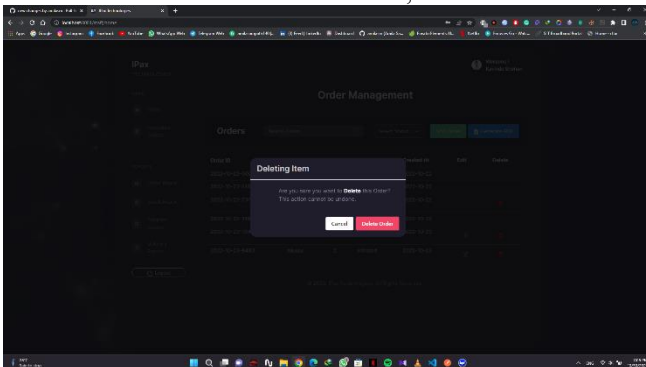


Figure 9: Delete Order

View all canceled orders with the canceled reason. Click the canceled order tab from the side menu

under the orders tab and navigate to the canceled orders page.

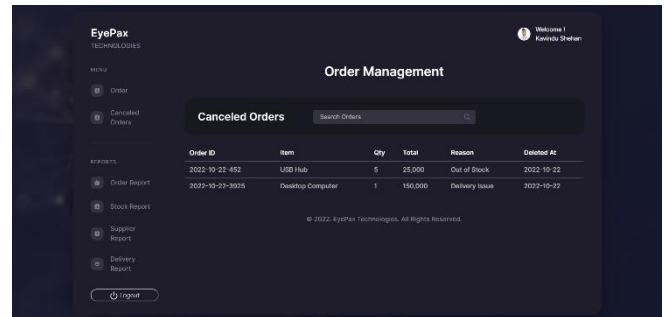


Figure 10: View Canceled Orders

C. *Function – 03*

This section is on Item adding and removing.

1) *Sprint 2*

Figure 11 will be used to view all items that user added to the system. User should login to the system and click on the “Supplier” button in the sidebar and its redirect to this interface. User can view all items and generate report for the items. Also, there are edit, delete, search and filtration functions.

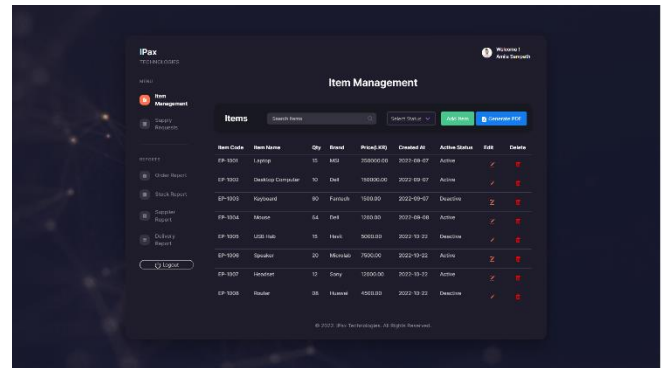


Figure 11: View Items

Figure 12 will be used to add items to the system by the user. The user should click the “Add Item” button from the Item view page and redirect to this page. User needs to fill the required fields such as Item code, Item name, Quantity and Brand. Finally, once the user clicks on the “Add Item” button if the details are valid, the item is created. If user clicks “Cancel” button, its redirect to item view page.

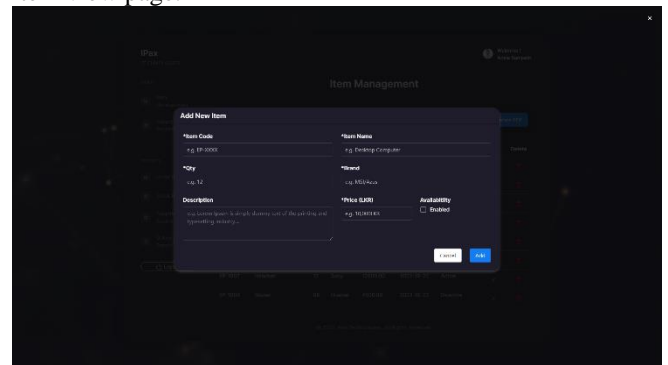


Figure 12: Add new item

This interface will be used to edit an existing item that user added to the system. After the user click on the edit icon in action tab on Items page, this window is popped. User can update fields (cannot update item code) and after click on “Update” button, the item is updated. Also, if user click on “Cancel” button, popup window will close.

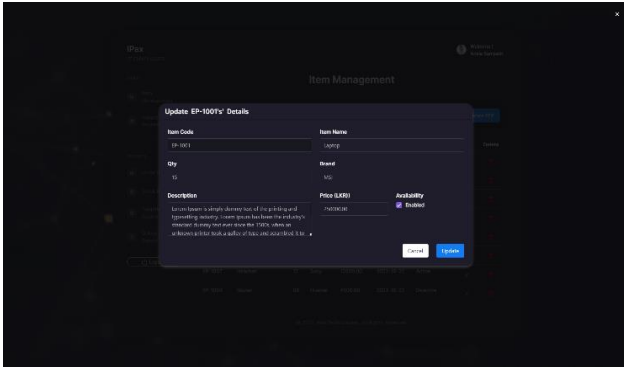


Figure 13: Edit Item

This interface will be used to delete item from the system. After the user click on the delete icon in action tab on Items page, this window is popped. User must confirm that this action needs to be done by clicking “Yes remove it!” button and it will delete. Also, if user click on “Cancel” button, popup window will close.

2) *Sprint 2*

This interface will be used to view supply requests. Suppliers need to login to the system and redirect to this interface. There is supply requests that system generate to this supplier. Supplier can accept or decline requests.

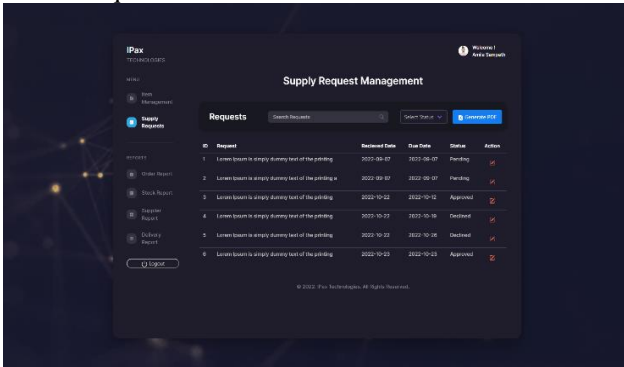


Figure 14: View Supply Requests

This interface will be used to accept supply request. After clicking on “Accept” button by the supplier this window is popped. When click on “Yes, accept” button, request will automatically accept and update the system. Also, if supplier click on “Cancel” button, popup window will close.

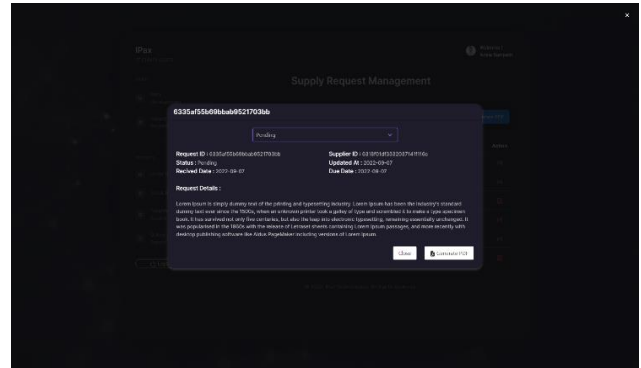


Figure 15: Decline Supply Request

Figure 15 will be used to decline supply request. After clicking on “Decline” button by the supplier this window is popped. Supplier must insert the reason for the declination and click on “Decline” button, request will automatically decline and update the system. Also, if supplier click on “Cancel” button, popup window will close.

D. *Function – 04*

1) *Sprint 1*

Sign in & view all users. After the user logs successfully redirect to view all user page.

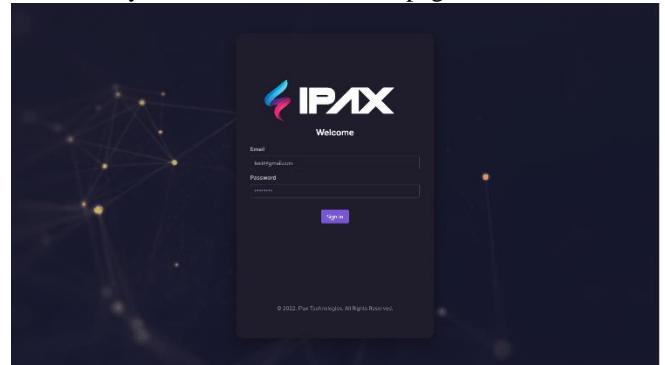


Figure 16: Login Page

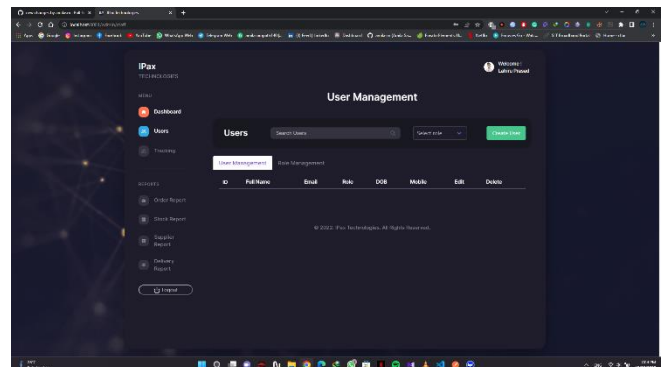
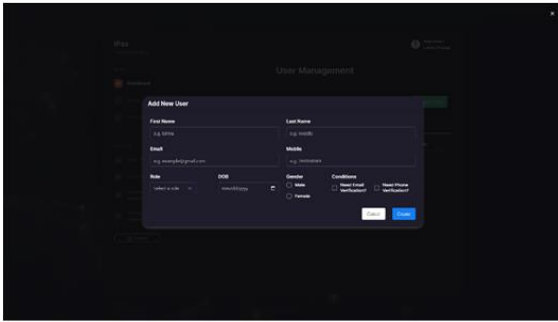


Figure 17: All Users Page

Add new user - Click the ADD USER button placed on top of the user table.



Update User - Click the update icon placed on user table rows.

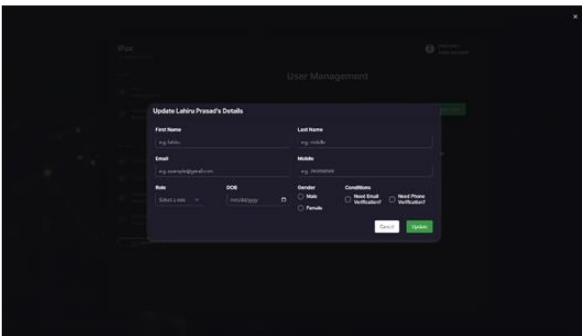
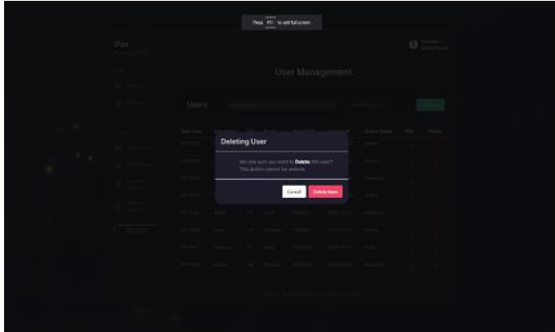


Figure 18: Update User

Delete user - Click the delete icon placed on user table rows.



Update user role - Click the Role management tab placed on top of user table.

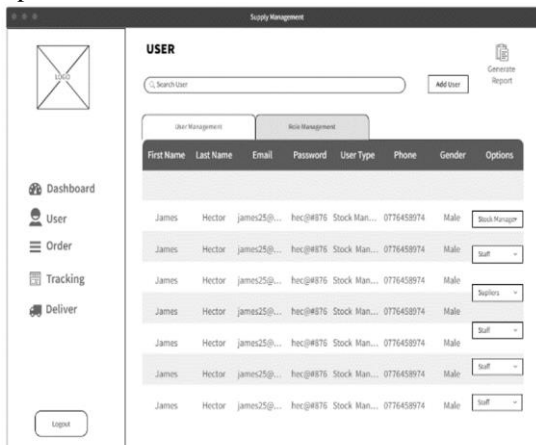


Figure 19: Update User Role

View All Shipping Item - Click the Delivery button placed on side bar.

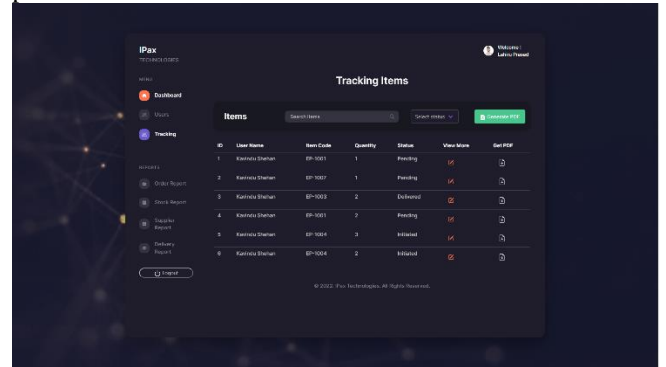
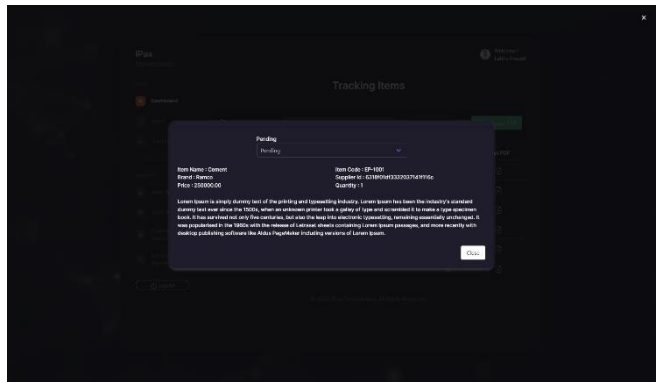


Figure 22: Tracking Items

Update Shipping Item status - Click the Tracking button placed on the sidebar.



View Shipping details of one item and generate a report using it. Click on the row in the Delivery details table.

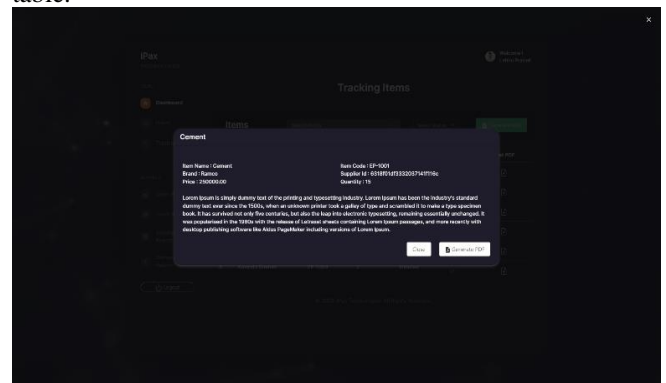


Figure 24: View Shipping Details

V. CONCLUSION

It is possible for human mistake to occur with the inventory because so much of how it is managed depends on the proprietor. There will be fewer mistakes made by humans if the owner has access to a database that can handle stock management. In addition to this, it will cut costs that are incurred because of unmanaged stocks going bad. Additionally, it will provide notice

warnings on the volume level of the stock, which will enable the owner to contact their supplier early, therefore preventing a delay in the manufacture of the product. Because the offered wireframe was created for a database system that is accessible to companies at a price that is reasonable for them, such as Microsoft Access, it is suitable for usage by those organizations. For the new database system design that IPax is working on, this wireframe design will serve as the foundation.

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