SYNTHESIS SYSTEMS INC.

PROJECT DOCUMENTATION ON

"INVENTORY MANAGEMENT SYSTEM"

SUBMITTED BY

Group 4

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CHAPTER-1: INTRODUCTION

1.1 Introduction to Inventory Management System

The project Inventory Management System is a complete desktop based application designed on Web Development programming languages. The main aim of the project is to develop Inventory Management System Model software in which all the information regarding the stock of the organization will be presented. It is an intranet based desktop application which has an admin component to manage the inventory and maintenance of the inventory system. This desktop application is based on the management of stock of an organization.

The application contains general organization profile, sales details, Purchase details and the remaining stock that are presented in the organization. There is a provision of updating the inventory also. This application also provides the remaining balance of the stock as well as the details of the balance of transaction. Each new stock is created and entitled with the name and the entry date of that stock and it can also be updated any time when required as per the transaction or the sales is returned in case. Here the login page is created in order to protect the management of the stock of the organization in order to prevent it from the threads and misuse of the inventory.

1.2 Purpose and benefits for the company

The purpose of an inventory management system is to streamline and optimize the management of inventory within a company. It provides a centralized platform to track, control, and analyze inventory-related data and processes. Here are the key benefits that an inventory management system offers to a company:

Improved Inventory Control: An inventory management system allows businesses to have a real-time view of their inventory levels, locations, and item details. This visibility helps prevent stockouts, overstocking, and stock discrepancies. Accurate inventory control leads to better customer service, increased operational efficiency, and reduced carrying costs.

Efficient Order Management: The system helps streamline the order management process by automating tasks such as order creation, fulfillment, and tracking. It ensures accurate and timely order

processing, reducing errors and improving customer satisfaction. Efficient order management also leads to improved inventory accuracy and faster order fulfillment.

Cost Savings: By providing insights into inventory levels and demand patterns, an inventory management system helps optimize stock levels. This optimization reduces excess inventory, minimizing carrying costs such as storage, insurance, and obsolescence. Additionally, it helps identify slow-moving or non-performing items, allowing businesses to make informed decisions about discounts, promotions, or discontinuations.

Enhanced Planning and Forecasting: Inventory management systems often offer forecasting and demand planning capabilities. By analyzing historical data, market trends, and seasonality, businesses can make more accurate predictions about future demand. This helps with procurement planning, production scheduling, and inventory replenishment, ensuring the right stock is available at the right time.

Increased Operational Efficiency: Automation of inventory-related tasks, such as stock tracking, order processing, and reporting, reduces manual effort and minimizes human errors. This improves operational efficiency, freeing up time for employees to focus on more value-added activities. Additionally, streamlined processes enable faster inventory audits, stock reconciliation, and overall smoother operations.

Better Decision Making: Inventory management systems provide comprehensive reporting and analytics features. Businesses can access key performance indicators (KPIs), such as stock turnover, carrying costs, and profitability, to make data-driven decisions. These insights help optimize inventory levels, identify trends, improve supplier relationships, and align inventory strategies with business goals.

Integration and Scalability: Inventory management systems often integrate with other business systems, such as POS systems, e-commerce platforms, or accounting software. This integration eliminates manual data entry, improves data accuracy, and facilitates seamless information flow across different departments. Additionally, these systems are typically scalable, accommodating business growth and expanding inventory needs.

Improved Customer Satisfaction: Accurate inventory control and efficient order processing contribute to better customer service. Businesses can fulfill orders promptly, avoid stockouts, provide accurate

delivery estimates, and quickly handle returns or exchanges. Enhanced customer satisfaction leads to increased customer loyalty, positive brand reputation, and potentially higher sales.

Overall, an inventory management system helps businesses gain control over their inventory, streamline operations, reduce costs, make informed decisions, and ultimately improve overall business performance. It is a valuable tool for companies of all sizes and across various industries to effectively manage their inventory-related processes.

1.3 Technologies used and Prerequisites for using the system

For Inventory management system to work as a web application, we have used various technologies that involve the development of website from both front-end and back-end.

Technologies used

Front-end	:	HTML, CSS, Bootstrap, JavaScript, JQ uery
Back-end	:	PHP
Databases	:	MySQL
Pie charts and Bar charts	:	Highcharts(HTML, CSS, Javascript)
Reports	:	fpdf library

Prerequisites needed for using the system

Operating System	:	Windows 7 or above
Application	:	XAMPP for Apache & mySQL server
Browser	:	Chrome, Microsoft Edge or Mozilla Firefox

Hardware Requirements

CPU	:	Pentium IV 2.4 GHz or above
Memory (Primary)	:	512 MB, 1 GB or above
Hard Disk	:	40 GB, 80GB, 160GB or above

CHAPTER 2 : SYSTEM ACCESS , AUTHENTICATION AND DATABASE OVERVIEW

2.1 Mode of Access

Admins can set up a local environment such as a local Apache and MySQL server for hosting the application in local scope, or if hosted on the Interweb as a website, users can access through HTTP requesting for the Web application's IP. Users can access the system through a web browser by visiting a specific URL.

They open a web browser (such as Google Chrome, Mozilla Firefox, Microsoft Edge, or Safari) on their computer or mobile device. Users enter the URL of the inventory management system provided by the company or system administrator into the browser's address bar. The system's login page will load, where users enter their credentials (username and password) to access the system. After authentication, users can navigate through the system's web interface to perform various tasks and access relevant features.

2.2 User Authentication process

2.2.1 Creating User Accounts

User Registration : When a user registers for the system, they provide a username and password.
The password should never be stored in plain text but should be securely hashed.

Hashing the Password : PHP provides functions like password_hash() to securely hash the user's password. When a user registers, you generate a hash of their password using this function. The function uses a secure hashing algorithm (e.g., bcrypt) to create a one-way hash of the password. The hash is a fixed-length string that represents the password but cannot be reverse-engineered to obtain the original password.

Storing the Hashed Password: The hashed password is stored in a database or other persistent storage associated with the user's account. The plain-text password is never stored, ensuring its security even if the database is compromised.

User Login : When a user attempts to log in, they enter their username and password.

Verifying the Hash : To authenticate the user, PHP provides the password_verify() function. You retrieve the hashed password associated with the user from the storage based on the provided username. Using password_verify(), you compare the entered password with the stored hashed password. The function performs the necessary operations to verify if the entered password matches the stored hash.

Granting Access : If the verification is successful (i.e., the entered password matches the stored hash), you consider the user authenticated.

Creating User Accounts : Determine the method: Decide how user accounts will be created. Either it will be a self-registration process or will accounts be created by an administrator

User registration form : If it's a self-registration process, create a user registration form with fields such as username, email address, and password. Include any additional fields required for your system, such as name, contact information, or user role. Validate the input to ensure data integrity and security.

Password hashing : Once the user submits the registration form, hash the password securely using PHP's password_hash() function. Store the hashed password along with other user information in the database or other persistent storage.

2.2.2 Logging into Created User Account

Login page : Create a login page with fields for username/email and password.
Design the page to submit the form securely using HTTPS.

Authentication : When the user submits the login form, retrieve the entered username/email and password. Retrieve the corresponding user record from the database based on the provided username/email. Use PHP's password_verify() function to compare the entered password with the stored hashed password. If the verification is successful, consider the user authenticated.

Session or token creation : Generate a session or token for the authenticated user to maintain their login state throughout their interaction with the system. Store the session or token securely, associating it with the user's account.

Redirect to the main interface : After successful authentication, redirect the user to the main interface or dashboard of the inventory management system. Provide appropriate links or navigation options for accessing different features and functionalities.

2.3 Instructions on Creating User Accounts and Signing in

2.3.1 Instructions for Creation of User Account

Creating User Accounts : User (Employee) account can be created and managed by administrator.

Password hashing : Once the user submits the registration form, hash the password securely using PHP's password_hash() function. Store the hashed password along with other user information in the database or other persistent storage.

2.3.2 Instructions for Logging In

Login page : Create a login page with fields for username/email and password. Design the page to submit the form securely using HTTPS.

Authentication : When the user submits the login form, retrieve the entered username/email and password. Retrieve the corresponding user record from the database based on the provided username/email. Use PHP's password_verify() function to compare the entered password with the stored hashed password. If the verification is successful, consider the user authenticated.

Session or token creation : Generate a session or token for the authenticated user to maintain their login state throughout their interaction with the system. Store the session or token securely, associating it with the user's account.

Redirect to the main interface : After successful authentication, redirect the user to the main interface or dashboard of the inventory management system. Provide appropriate links or navigation options for accessing different features and functionalities. Remember to implement proper error handling, such as displaying relevant error messages for incorrect login credentials or any other authentication-related issues.

2.4 Database Overview

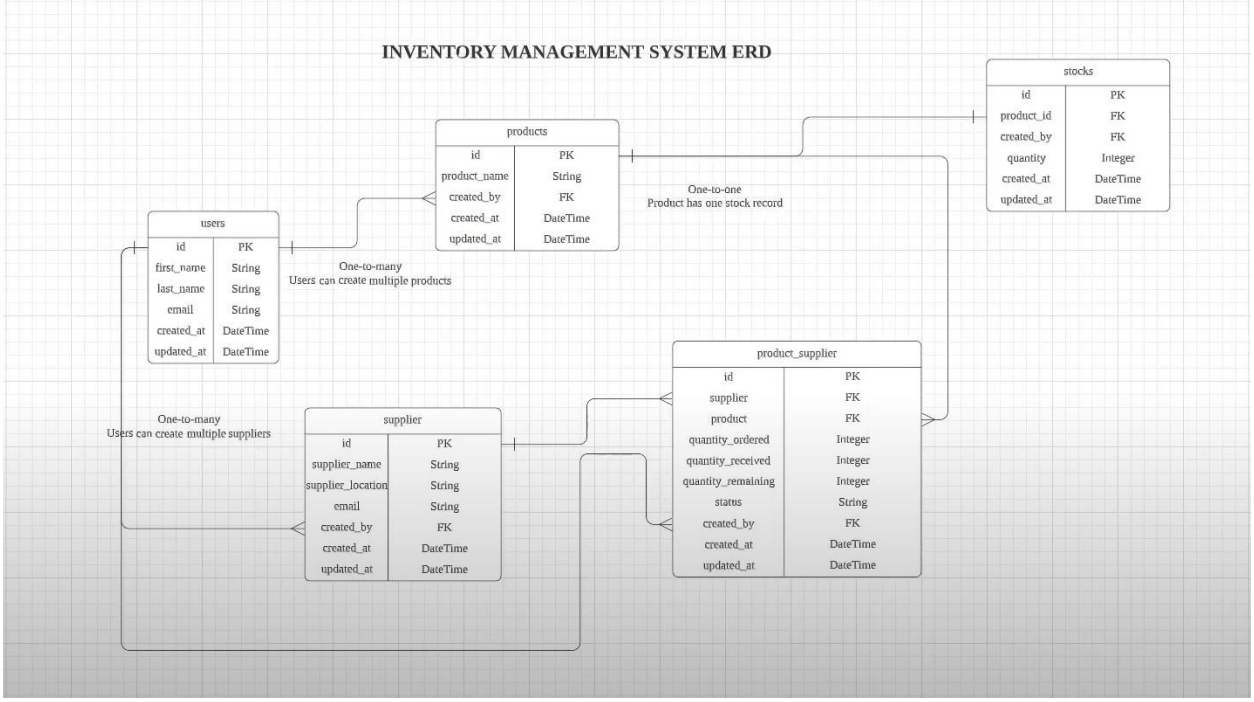

Fig 2.4.1 ER diagram for inventory management system

- The inventory management system consists of the following table as shown in Fig 2.4.1 such as Users, Products, Stocks, Supplier, Product supplier etc

CHAPTER 3 : DASHBOARD OVERVIEW

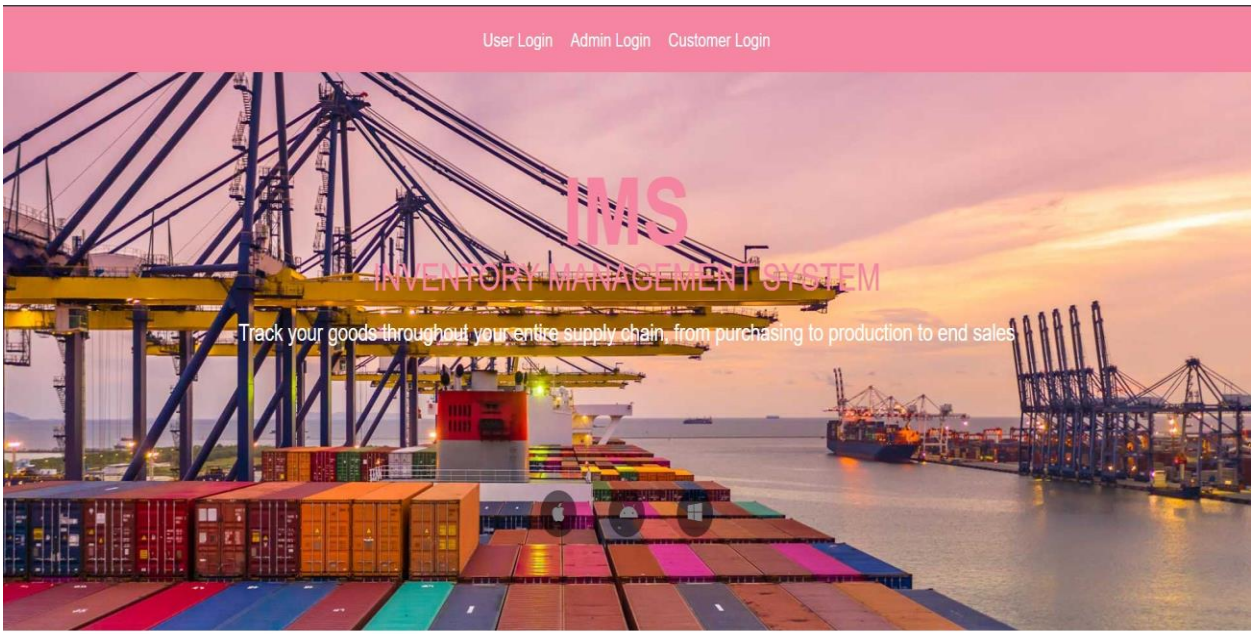

Fig 3.1 Homepage of Inventory Management System

- Homepage has three login options, namely: User (Employee) Login, Admin Login and Customer Login

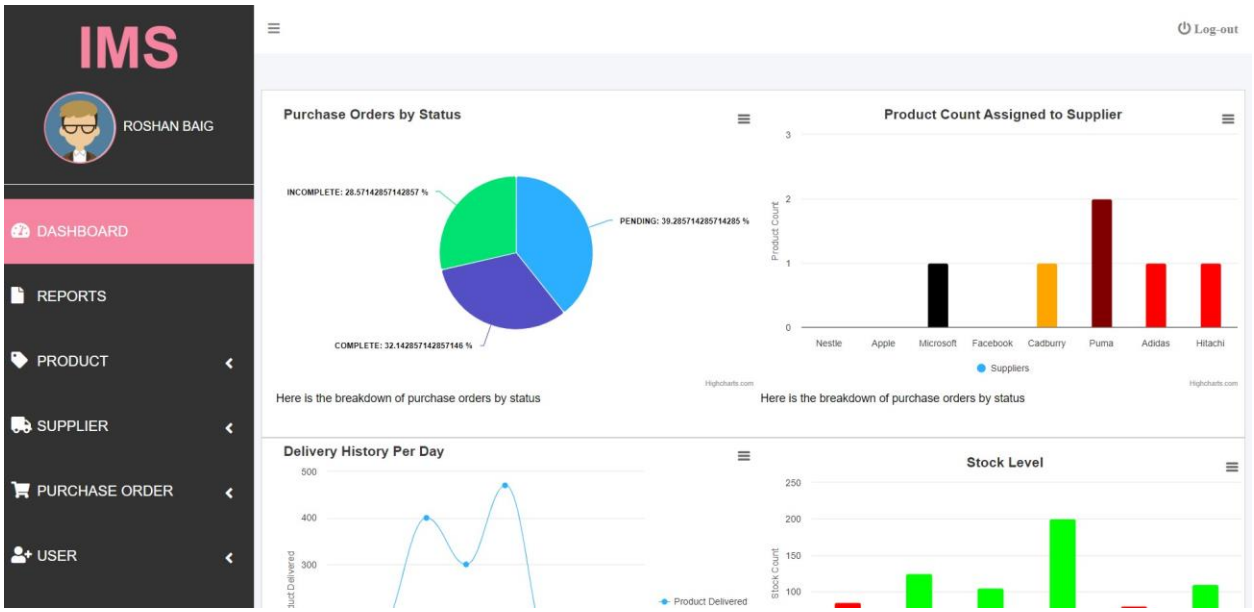

Fig 3.2 Dashboard for Users and Admins

- Dashboard showing various data charts like Purchase orders by status, Product count assigned to supplier, Stock level and Delivery history per day

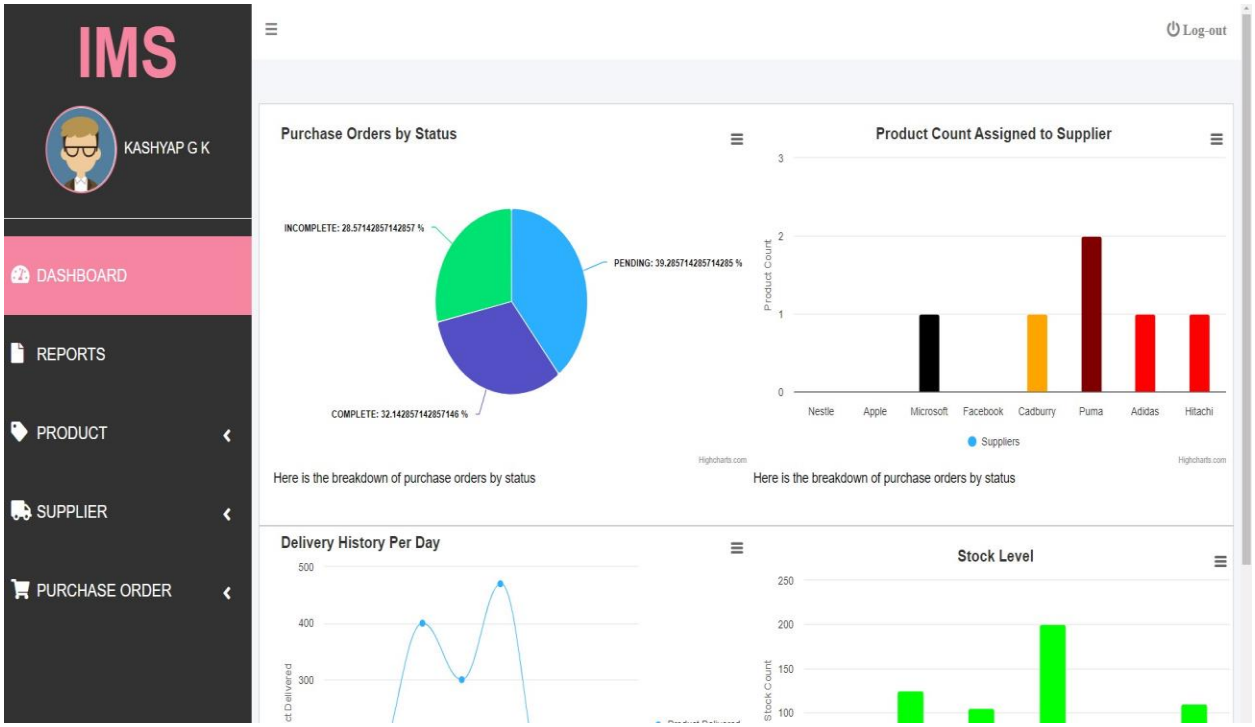

Fig 3.3 Customer Dashboard

- User (Employee) Dashboard is similar to Admin Dashboard, But users cannot manage or perform CRUD operation on other users only Admin has those previledges.

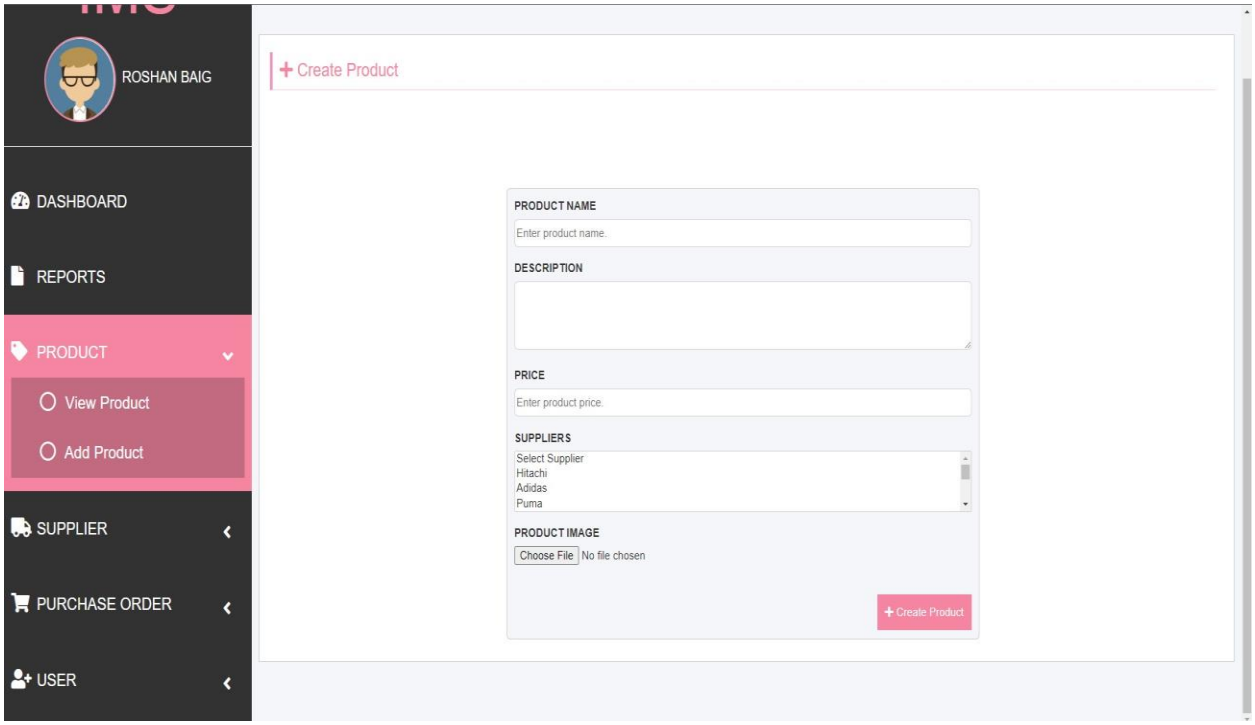

Fig 3.4 Admin having access over Add product page

- IMS Admins and users are provided with the accessibility to adding newly created product to the Inventory.

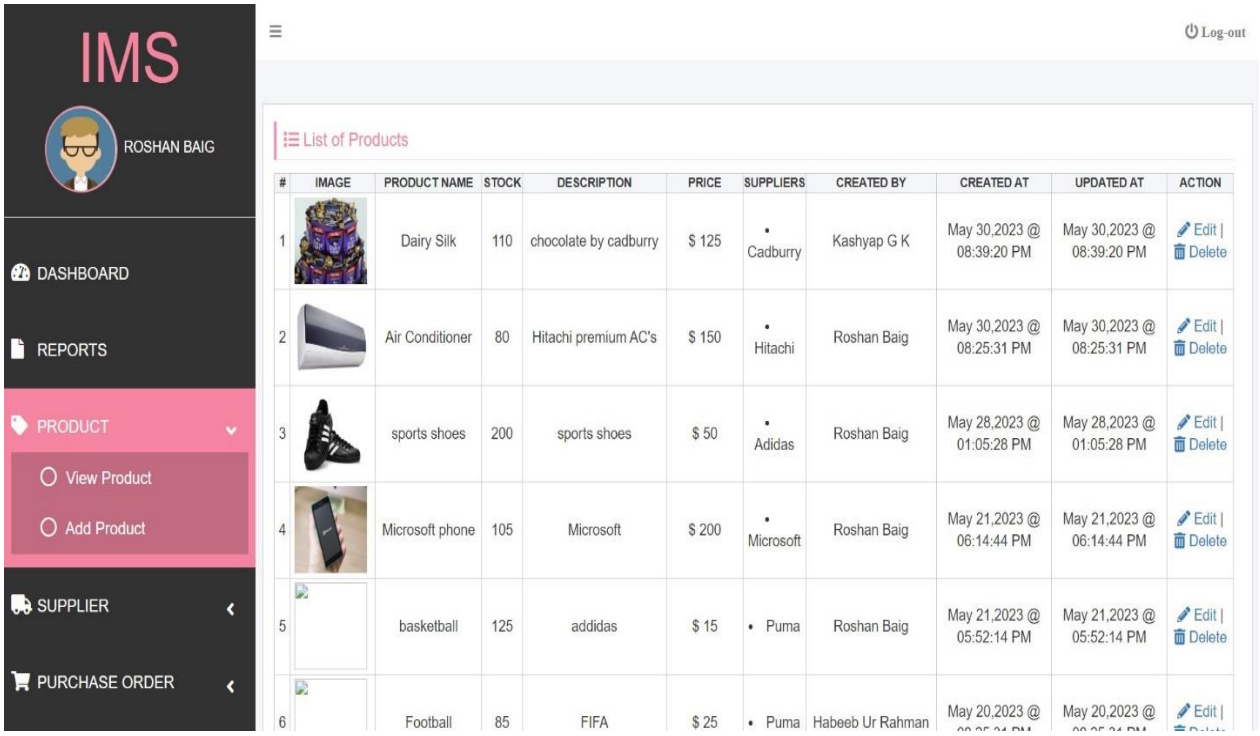

Fig 3.5 View Products

- Admins and Users can view all the products available as well as perform CRUD operations on products.

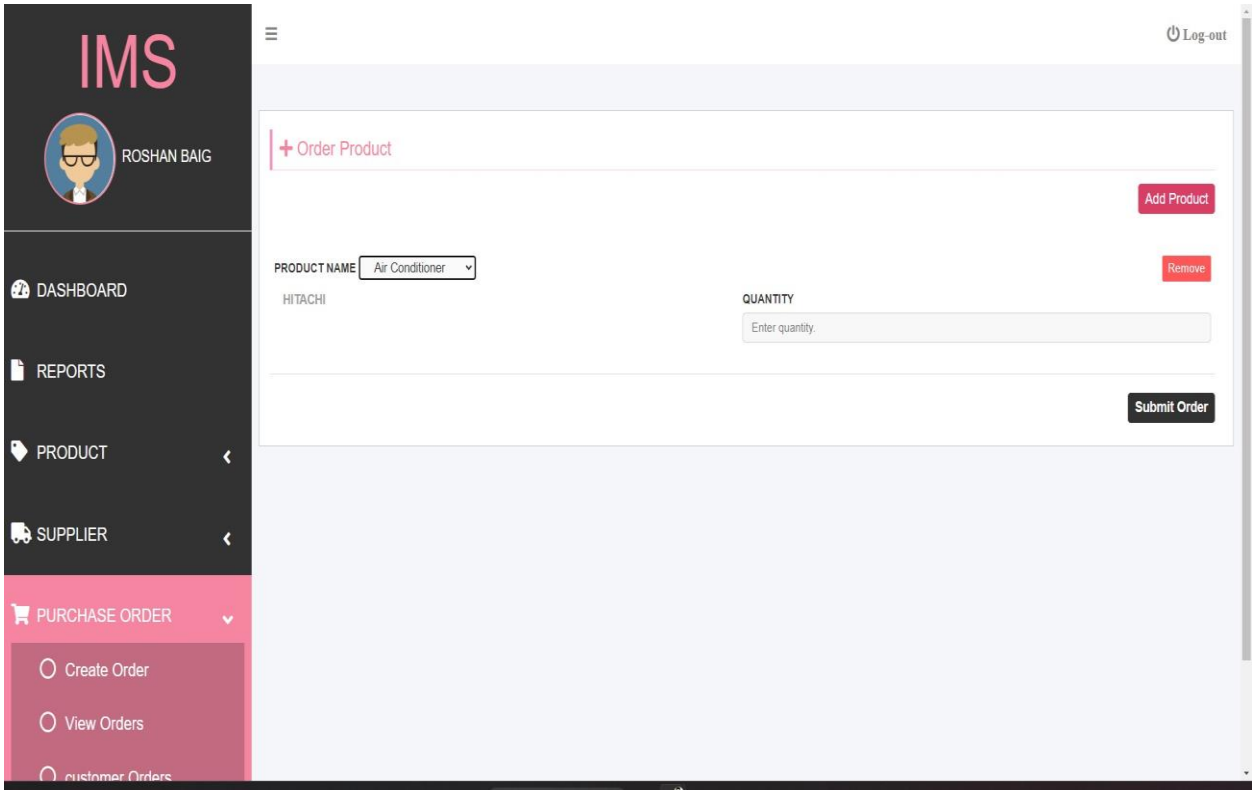

Fig 3.6 Admin/User Creating an order to the Supplier

- Admins and Users can create an order for the product and specicify the quantity required and submit the order to their suppliers.

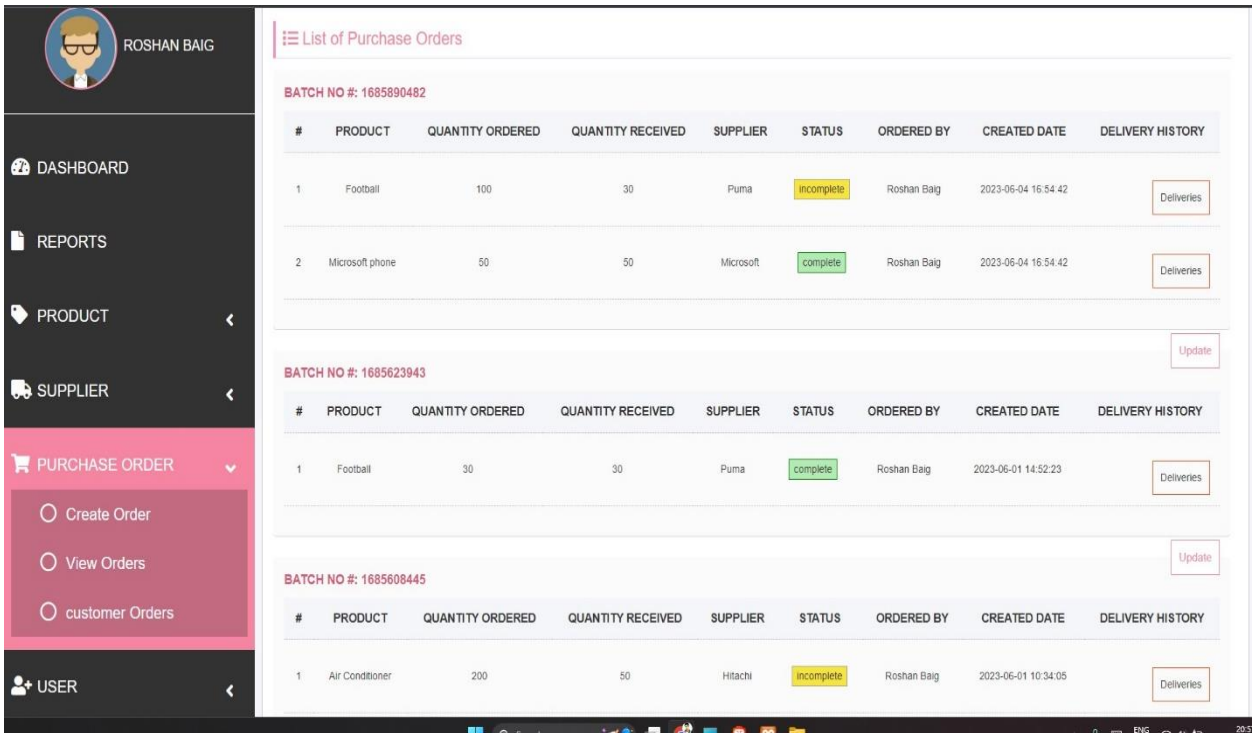

Fig 3.7 View orders

- Admins and users can keep track of all the orders to their suppliers and keep on updating the status as well as perfrom CRUD operations on orders.

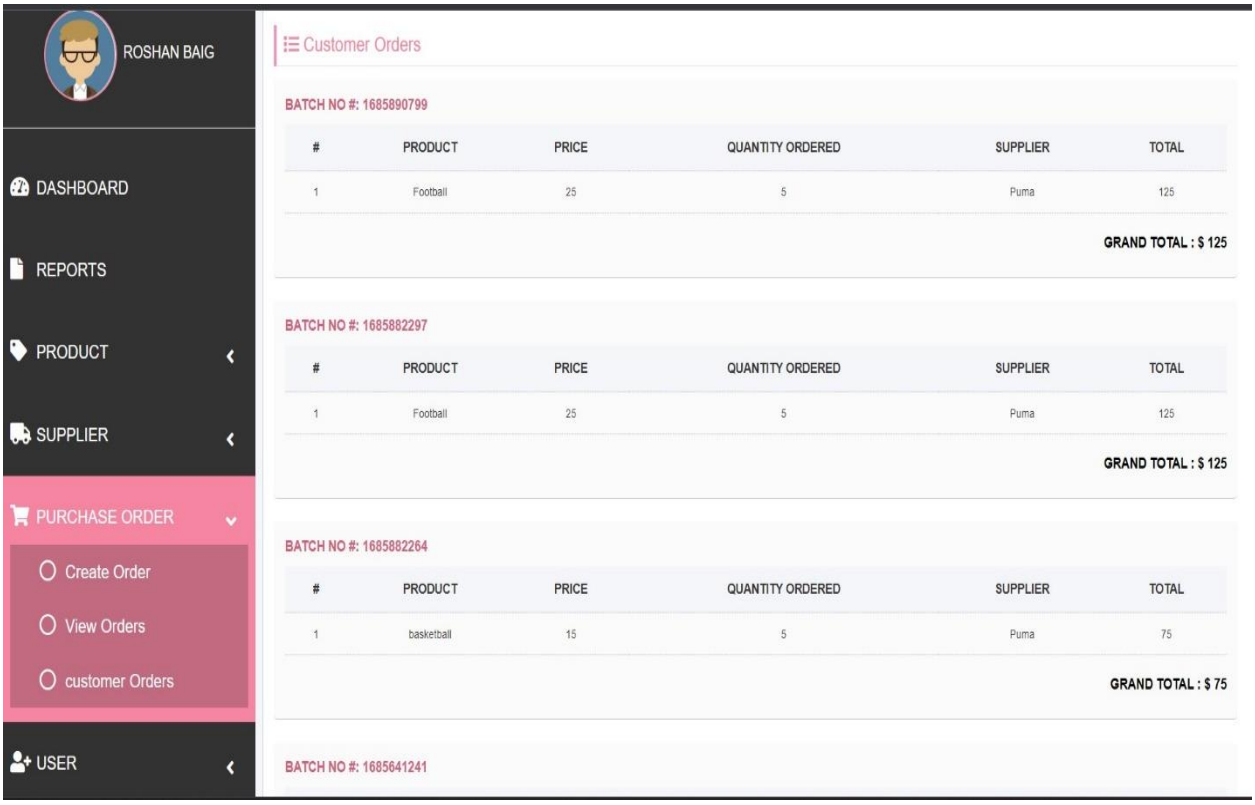

Fig 3.8 Customer orders

- Admins and Users can keep track of all the customer orders.

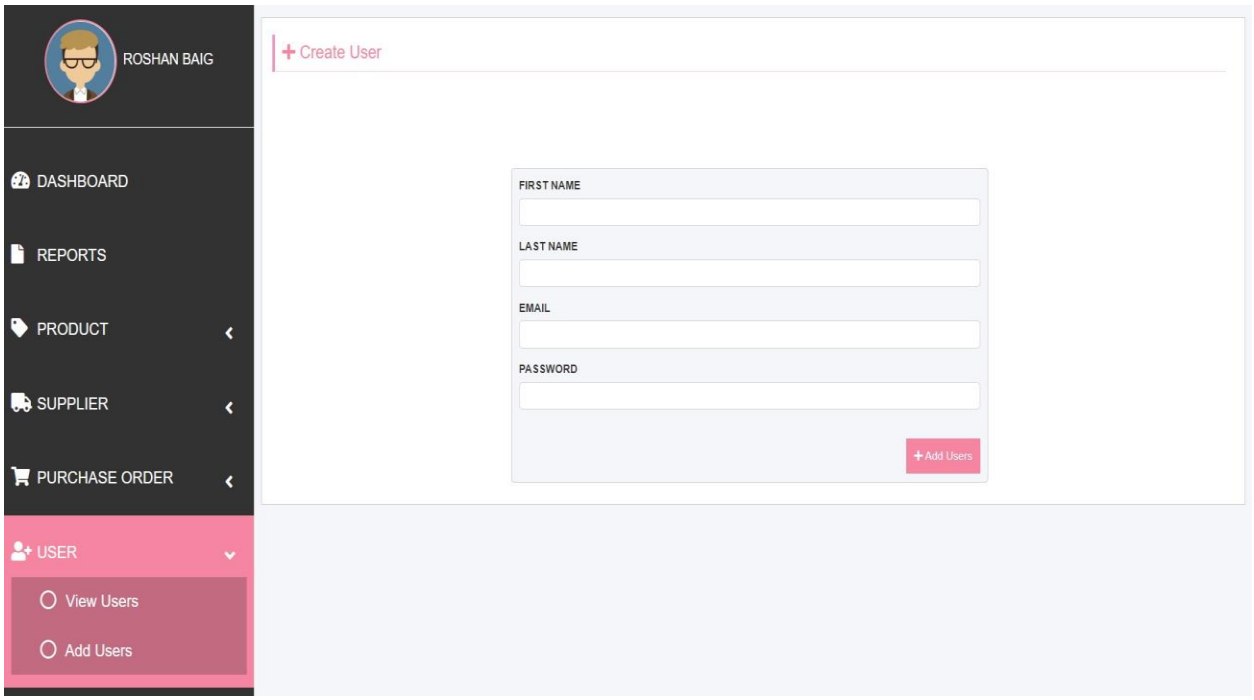

Fig 3.9 Admin having the privilege to Add more number of users

- Admins do have the special attribute to add more number of Users to the IMS and Perform CRUD operations on users.

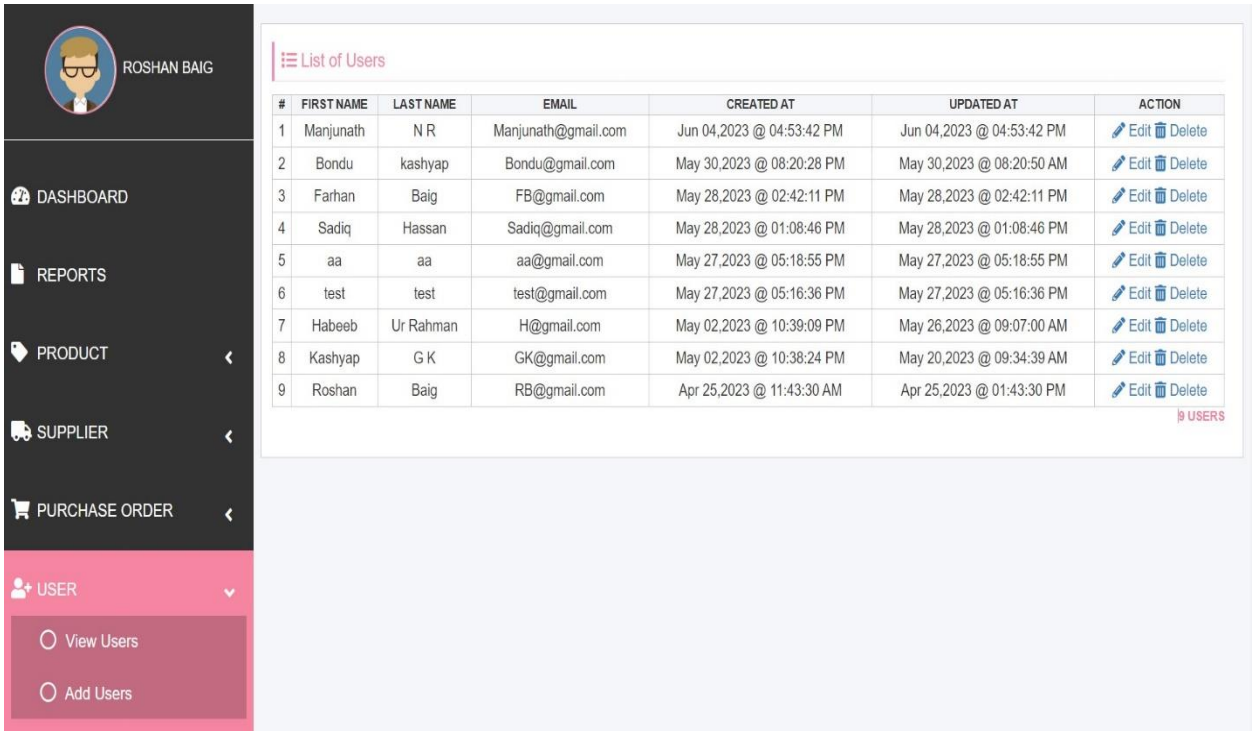

Fig 3.10 Users View

- Admins can view all the users and perform CRUD operations on users.

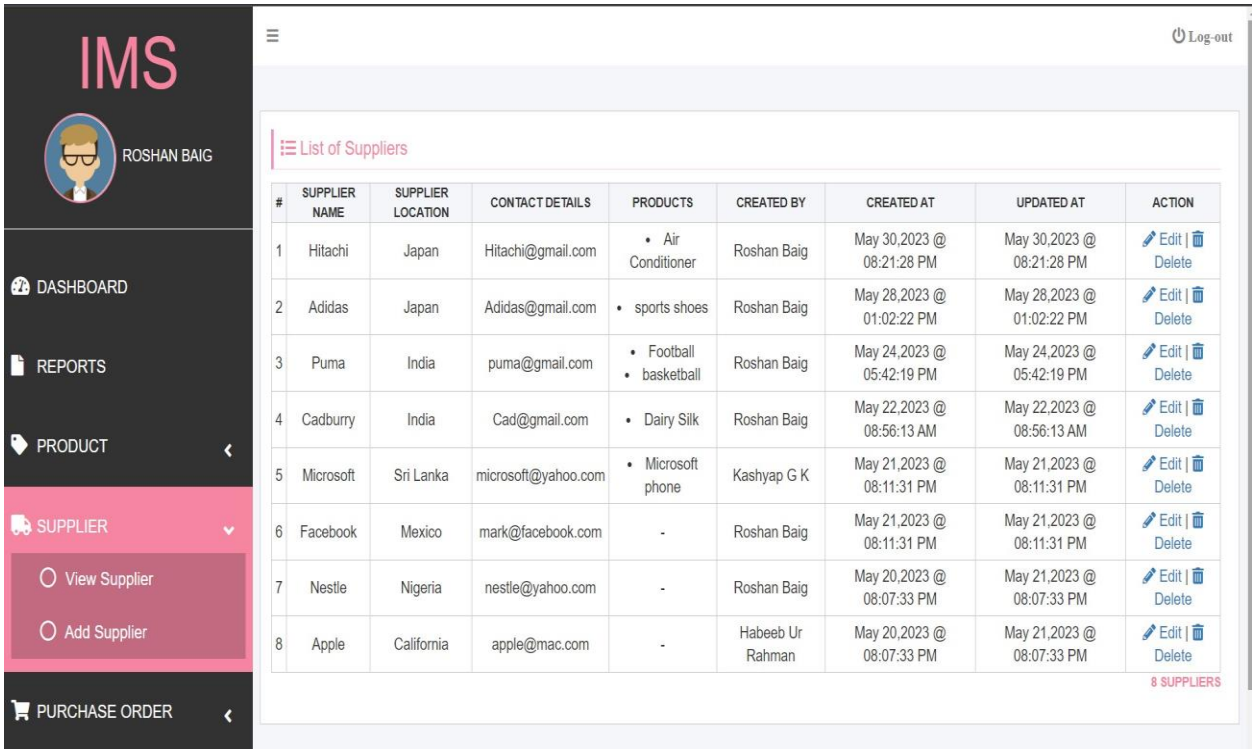

Fig 3.11 A view of Supplier Statistics

- The Admins as well as the users can view the suppliers and manage the suppliers

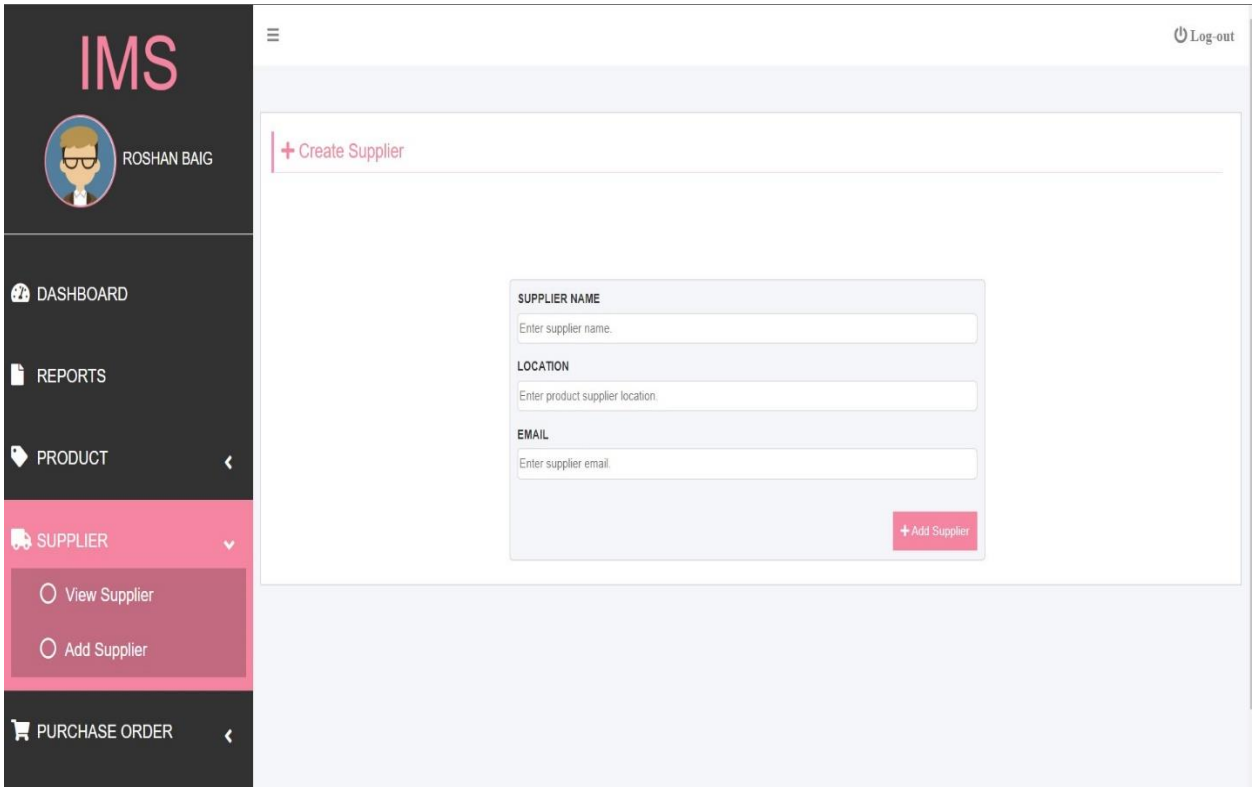

Fig 3.12 Add Suppliers

- Admins and Users can add new suppliers to the IMS

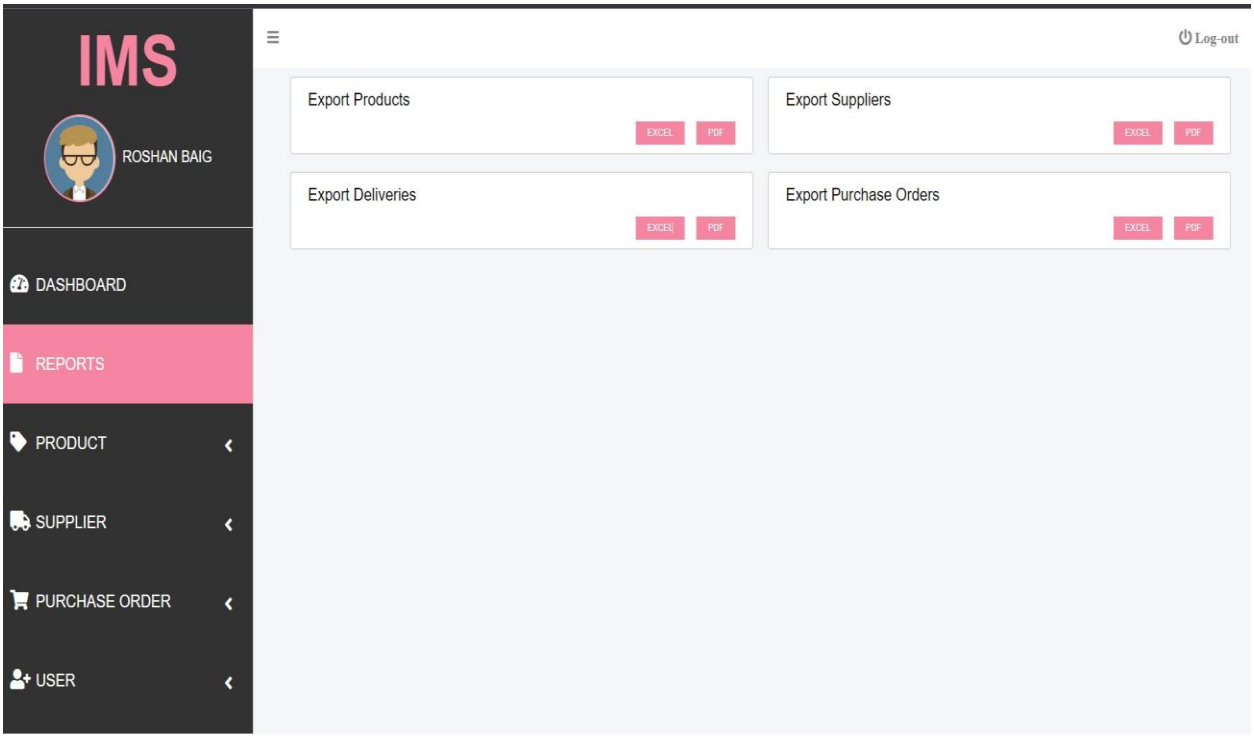

Fig 3.13 Dashboard showing the Data to be exported as CSV/PDF file

- The users can export the data shown in the dashboard to their local machine in the CSV or PDF file format, Reports can be generated for Products, Suppliers, Deliveries and Purchase Orders

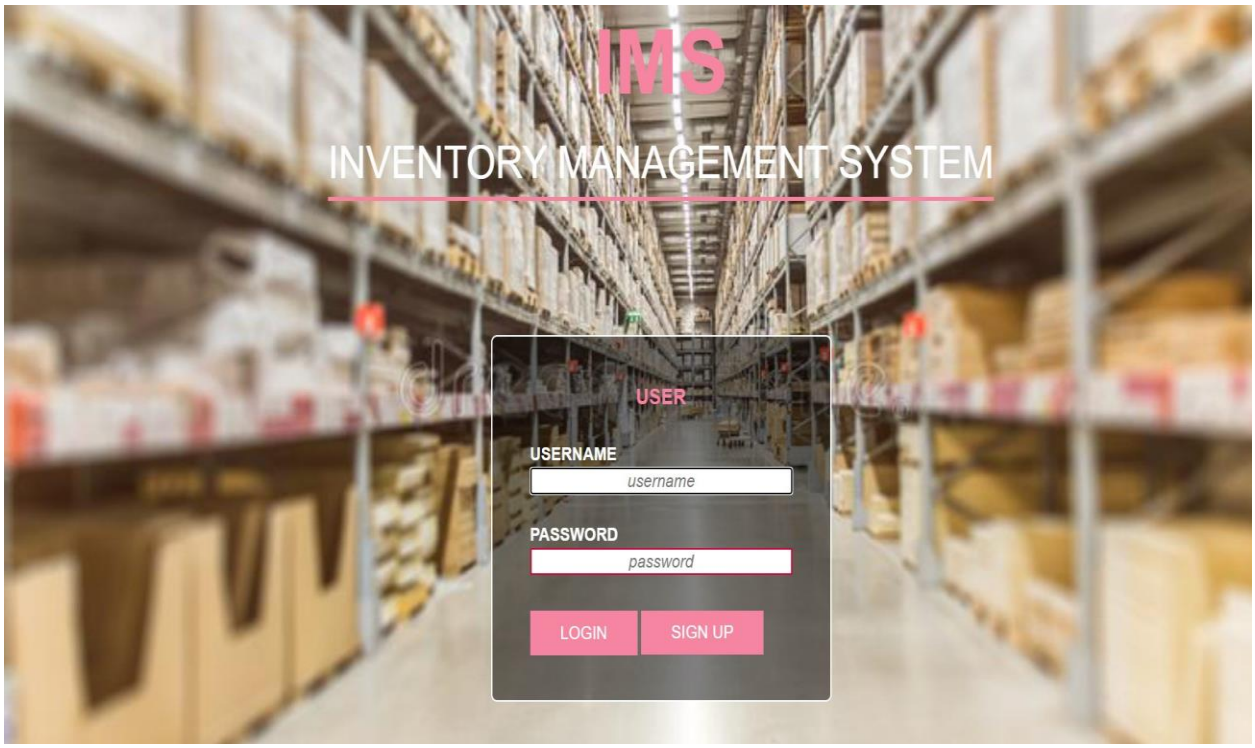

Fig 3.14 Customer login page

- A Customer can login or sign-up.

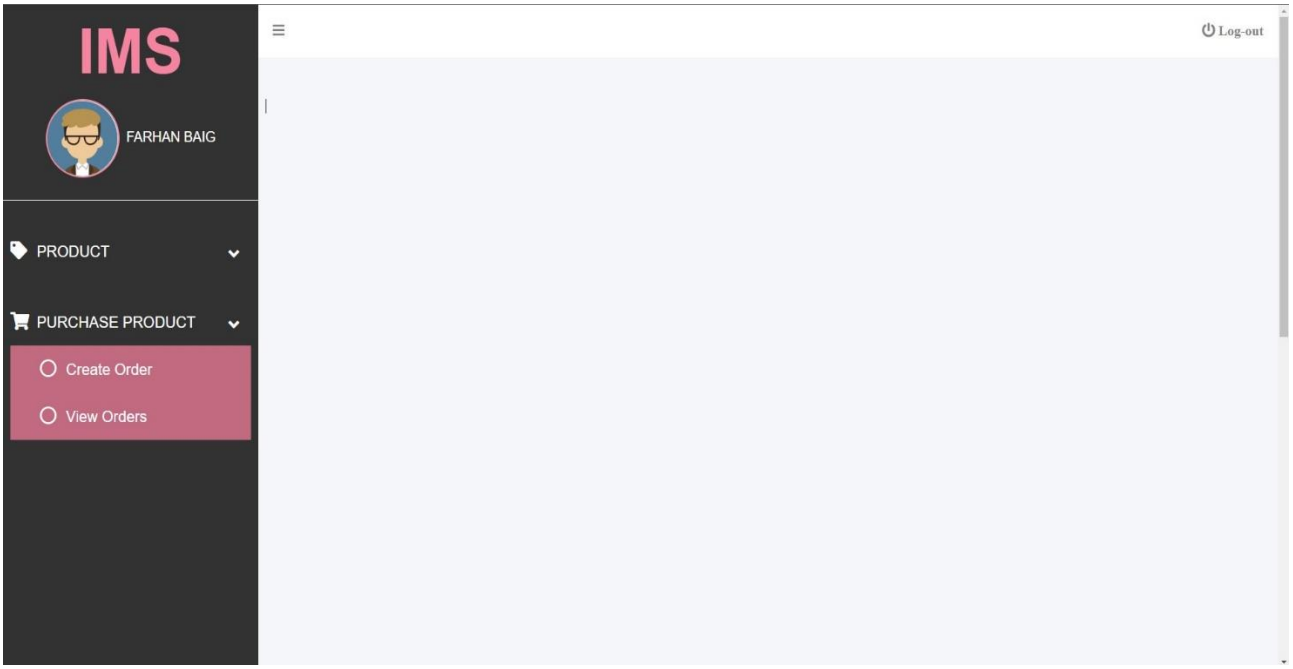

Fig 3.15 Customer Dashboard

- Customers can view all the products available as well as create orders

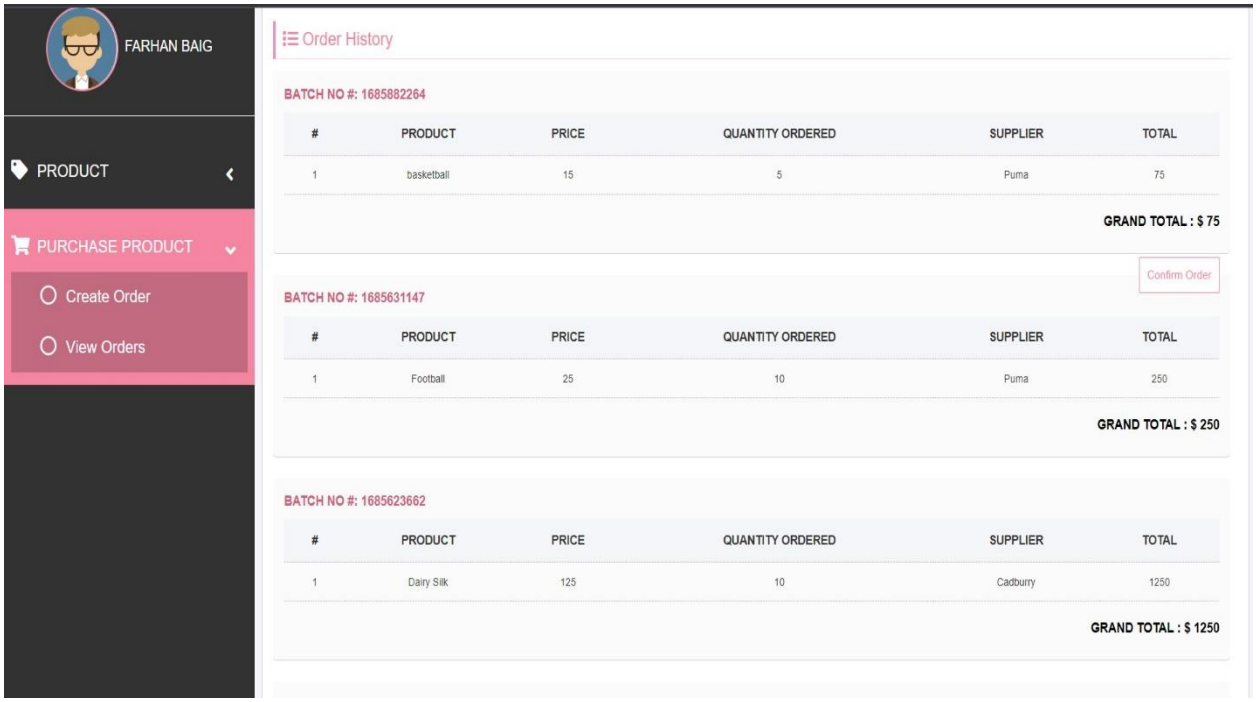

Fig 3.16 Customer Order

- Customers can created and confirm their orders as well as view their order history

CHAPTER 4 : MANAGING INVENTORY

4.1 Addition of new Items/Products to the Inventory

Access the System: Log in to the inventory management system using your credentials.
Ensure that you have the necessary permissions to add new items to the inventory. If not, contact the system administrator for assistance.

Navigate to the Dashboard Section: Users and Admins can add new products by selecting Add Product options from the dashboard.

Fill in the Item Details: A form or dialog box will appear, prompting you to enter the details of the new item. Provide the required information such as the item's name, description, SKU (stock keeping unit), category, price, quantity, and any other relevant attributes.

Save the Item: Once you have entered all the necessary details, click on the "Create Product" button to save the new item in the inventory.

Review and Verify: After saving the new item, take a moment to review the details and ensure their accuracy. Verify that the item appears correctly in the inventory management system, including all the provided information.

Repeat for Additional Items: If you need to add more items to the inventory, repeat the above steps for each additional item. Follow the same process to enter the details, set parameters, and save the items. Adding new items to the inventory enables proper tracking, organization, and management of products within the system. It is essential to maintain accurate and up-to-date information to ensure smooth inventory operations and effective inventory control.

4.2 Updating existing items in the Inventory

Log in to the inventory management system using your credentials.

Ensure that you have the necessary permissions to update items in the inventory. If not, contact the system administrator for assistance.

Navigate to the View Products Section: This section typically contains options and functions related to managing inventory items.

Select the Item for Update: Select the item and click on “Edit” button to update an item/product, Users and Admins can perform all CRUD operations on products.

Modify Item Details: A form or dialog box will appear, displaying the current details of the selected item. Update the necessary information that needs to be changed. You can modify fields such as the item's name, description, category, price, quantity, attributes, or any other relevant information. Make the required changes to reflect the updated information accurately.

Save the Changes: Once you have made the necessary updates, click on the "OK" button to save the modifications to the item. The system will typically update the item's details in the inventory database or storage.

Review and Verify: After saving the changes, take a moment to review the updated details and ensure their accuracy. Verify that the item reflects the updated information correctly within the inventory management system.

Repeat for Additional Updates: If you need to update more items in the inventory, repeat the above steps for each item that requires modification.

Follow the same process to select, update, and save the changes for each item.

Updating existing items in the inventory ensures that the system reflects the most up-to-date and accurate information about the products. Regularly reviewing and updating item details helps maintain inventory integrity, facilitates effective inventory management, and enables accurate reporting and analysis.

CHAPTER 5 : STOCK MANAGEMENT

5.1 Updation of the Stock levels of the items in the Inventory

Access the System: Log in to the inventory management system using your credentials. Ensure that you have the necessary permissions to update stock levels. If not, contact the system administrator for assistance.

Navigate to the View Products Section: This section typically contains options and functions related to managing inventory items.

Select the Item for Update: Select the item and click on “Edit” button to update an item/product, Users and Admins can perform all CRUD operations on products.

Modify Item Details: A form or dialog box will appear, displaying the current details of the selected item. Update the necessary information that needs to be changed. You can modify fields such as the item's name, description, category, price, quantity, attributes, or any other relevant information. Make the required changes to reflect the updated information accurately.

Save the Changes: Once you have made the necessary updates, click on the "OK" button to save the modifications to the item. The system will typically update the item's details in the inventory database or storage.

Order more stock: Navigat to purchase order section and click on “Create Order” option, where Users and Admins can order products and update their stock levels.

Review and Verification: After saving the stock update, review the updated stock level for the item. Verify that the stock level reflects the intended change accurately within the inventory management system.

CHAPTER 6 : GENERATION OF REPORTS

6.1 Exporting reports from highcharts

Set Up Highcharts: Ensure that Highcharts is installed and set up in your project. You can include the Highcharts library by including the required JavaScript and CSS files in your HTML document.

Prepare the Data: Gather the necessary data for generating the inventory status report. This data should include information such as item names, current stock levels, categories, or any other relevant data points. Organize the data in a format suitable for Highcharts, such as an array of objects or an array of arrays.

Create a Container Element: In your HTML document, create a container element (e.g., a) where you want to display the inventory status report. Assign it an ID or a class for easy identification.
Generate the Highcharts Report: In your JavaScript code, select the container element using its ID or class. Use Highcharts to generate the report by calling the Highcharts functions and methods.
Configure the chart type (e.g., column chart, bar chart, pie chart) based on your requirements and the data you want to visualize. Provide the prepared data to Highcharts for rendering the inventory status report.

Customize the Report: Customize the appearance and behavior of the inventory status report as needed. Highcharts provides numerous configuration options for modifying the chart's appearance, including colors, labels, tooltips, legends, and more. Refer to the Highcharts documentation for a comprehensive list of available configuration options and methods.

Render the Report: Once you have configured the chart and customized its appearance, render the inventory status report by calling the appropriate Highcharts rendering method. Highcharts will generate the report and display it within the designated container element on your web page.

Test and Refine: Test the generated inventory status report to ensure that it accurately represents the data and meets your requirements. Make any necessary refinements or adjustments to the chart configuration or data to improve the clarity and usefulness of the report.

Update the Report: As your inventory data changes, update the report by refreshing the data and re-rendering the Highcharts chart. You can programmatically update the data source and call the rendering function again to display the most up-to-date inventory status report.

6.2 Available report options

Current Inventory Levels Report: The current inventory levels report provides an overview of the quantities of each item currently in stock. It displays the item names, their corresponding stock levels, and potentially other relevant information such as item codes, categories, or locations. This report helps users quickly assess the availability of each item and make informed decisions regarding restocking or fulfillment.

Low Stock Alerts Report: The low stock alerts report identifies items that have reached a predefined minimum stock level or a threshold set by the system or the user. It highlights items that are running low in quantity and may require attention to avoid potential stock outs or delays in fulfilling customer orders. The report typically displays the item names, current stock levels, and any configured reorder points or thresholds. Users can use this report to proactively initiate purchase orders or replenishment activities for items that are nearing depletion.

Out of Stock Alerts Report: The out of stock alerts report highlights items that have depleted their stock entirely and are currently unavailable for sale or distribution. It helps users identify items that need immediate attention and prompts action to restock or reorder them. The report lists the item names, indicating that they are currently out of stock, and may include details such as the date/time of depletion or expected replenishment date if known. Users can prioritize their efforts to address out-of-stock situations and avoid potential customer dissatisfaction or missed sales opportunities. These report options provide valuable information to inventory managers, purchasing teams, and other stakeholders involved in inventory control and management. By regularly reviewing these reports, users can make informed decisions regarding restocking, inventory optimization, and order fulfillment, ensuring smooth operations and customer satisfaction.

The availability and specific configuration of these reports may vary depending on the inventory management system in use. Some systems also allow customization of report parameters, such as defining the low stock and out of stock thresholds or specifying additional information to include in the reports.

CHAPTER 7 : EXPORTING DATA

7.1 Export inventory data in CSV or PDF format

Access the Inventory Management System: Log in to the inventory management system using your credentials. Ensure that you have the necessary permissions to access and export inventory data. If not, contact the system administrator for assistance.

Navigate to the Report Section: Here users and admins can export the data their local machine in the CSV or PDF file format, Reports can be generated for Products, Suppliers, Deliveries and Purchase Orders

Select the Data to Export: Select which data to be exported.

Choose the Export Format: Select the desired export format, such as CSV or PDF from the available options.

Open the Exported File: Locate the exported file on your computer or device and open it using the appropriate software, such as Microsoft Excel or a CSV reader. The file will contain the inventory data in the selected format, with each data field or column separated by commas (CSV) or organized in rows and columns (Excel).

Review and Use the Exported Data: Review the exported inventory data in the CSV or Excel file. Make use of the data for further analysis, reporting, sharing with stakeholders, or any other relevant purposes.

CHAPTER 8 : TROUBLESHOOTING AND SUPPORT

8.1 Troubleshooting tips for common issues

Login Issues: Double-check the login credentials to ensure they are entered correctly, including usernames and passwords. If you're unable to log in, try resetting your password using the "Forgot Password" option if available. Clear your browser cache and cookies, then attempt to log in again.
If the issue persists, contact the system administrator for assistance.

System Performance Issues: Check your internet connection to ensure it is stable and functioning properly. Clear your browser cache and cookies to improve performance. If the system is slow, try using a different browser or device to see if the issue is specific to your current setup. If other users are experiencing the same issue, contact the system administrator to report the performance problem.

Data Sync Issues: Verify that you have a stable internet connection to ensure proper data synchronization between the inventory management system and any connected devices or databases. If you notice missing or outdated data, refresh the page or navigate to the corresponding section to trigger a sync. Check for any system notifications or error messages related to data synchronization. If the issue persists, contact the system administrator for further investigation.

Incorrect Data Entry: Double-check the data you entered for accuracy, paying close attention to quantities, item names, and other relevant details. Ensure that you are using the correct units of measurement or formatting requirements specified by the system. If you notice incorrect data after saving or submitting, see if the system allows for editing or updating the entered data. If necessary, consult the system documentation or contact the system administrator for guidance on correcting or updating data.

Missing or Unavailable Functions: Confirm that you have the necessary user permissions to access certain functions or features. Check if the missing function is available in a different section or module within the system. If you believe you should have access to a particular function but cannot find it, contact the system administrator for assistance.

Error Messages: Read and understand the error message displayed on the screen. It may provide clues about the cause of the issue. Take note of the specific error message, and if possible, capture a screenshot

to provide to the system administrator or support team for troubleshooting. Search for the error message or issue in the system's documentation or knowledge base for potential solutions or guidance. If necessary, report the error message to the system administrator or support team for further assistance.

System Updates and Maintenance: Check if the system is undergoing scheduled maintenance or updates. In such cases, certain functions may be temporarily unavailable. Follow any instructions or notifications provided by the system administrator regarding maintenance periods. If you encounter issues after system updates, try clearing your browser cache and cookies or restarting your device to ensure you have the latest version of the system.

CONCLUSION

Summary

Overview of the Inventory Management System: The documentation provides a brief overview of the inventory management system, including its purpose, benefits, and features.

Accessing the System: Users can access the system through a web-based interface using a supported web browser. Authentication is required to log in, and the documentation may mention the use of PHP hashing for password security.

User Account Creation and Login: Instructions are provided for creating user accounts, including entering necessary information and selecting appropriate access permissions. The process of logging in with created user accounts is explained.

Managing Inventory: Adding New Items: Users can add new items/products to the inventory by entering relevant details such as name, description, quantity, and other attributes.

Updating Existing Items: Instructions are provided for updating existing items in the inventory, including modifying attributes or quantities.

Deleting Items: Users can delete items from the inventory when they are no longer needed.

Stock Management: Updating Stock Levels: Users can update the stock levels of items in the inventory, either by manually entering new quantities or through automated processes such as receiving incoming stock or fulfilling outgoing orders.

Stock Movements: The system may include features for tracking stock movements, such as tracking incoming and outgoing stock, transfers between locations, or adjustments.

Generating Reports: Highcharts Integration: Users can generate reports on inventory status using Highcharts, a charting library.

Report Options: The documentation describes available report options, such as current inventory levels, low stock alerts, and out of stock alerts.

Exporting Data: Users can export inventory data in CSV or Excel format. Instructions are provided for selecting data to export, choosing the export format, and saving the exported file.

Troubleshooting: The Encouincludes a section with troubleshooting tips for common issues users might encounter, covering areas such as login problems, system performance, data synchronization, data entry errors, missing functions, and error messages. Users are advised to refer to the documentation, contact the system administrator, or seek technical support when facing issues.