



PHARMACY PURCHASE MANAGEMENT SYSTEM

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Abstract : The Pharmacy Purchase Management System (PPMS) is a sophisticated system that is used to replace the manual procurement process and the existing system used for the current procurement process. Here the system is built on the expectation that the system works efficiently and helps to streamline the procurement process and make the procurement process easy for the medical institutions.

This system does all the things in the pharmacy item procurement process like placing orders, generating POs, generating GRNs, adjusting the MRP of the medicine and other items required in the medical process, deciding the best quotations from the existing quotations using the quotation comparison process.

One of the stand-out features of the application is it can be easily integrated with the existing application to provide a seamless experience for the procurement team and the medical staff.

This integration provides real-time updates and accurate stock management and maintains a report that the pharmacy staff has accurate information about the inventory level to overcome the situation of overstock or out-of-stock medical products. Real-time data updating helps in stock management more efficiently and boosts overall operational effectiveness.

Keywords - Pharmacy Purchase Management, Inventory Control, Procurement Process, Healthcare Facilities, Resource Management, Integration Capabilities, Ajax, jQuery, Purchase Orders, Goods Received Note, Stock Management.

I. INTRODUCTION

The Pharmacy Purchase Management System is a comprehensive solution that is used to streamline the procurement process and increase the efficiency of the procurement process. This system plays a crucial link between the patients and health care facilities. They contribute in various aspects such as medication management, and public health promotion and contribute in various ways to the healthcare system and ensure efficient communication to reduce the gap between patient and pharmacy.

This system includes various functions for automation simplifying the tasks and reducing the inefficiencies in the traditional procurement system. The various modules together work to produce a streamlined system. The PPMS include some important functions such as Quotation confirmation, purchase order creation, goods received note generation, stock management, purchase rate and maximum retail price modification, and purchase order tracking which makes the application more efficient than the existing application.

This application is developed by leveraging modern technologies such as C-Sharp, jQuery, Ajax, HTML, CSS, Oracle, and ASP.NET. Generally, the procurement plays an important role process in the healthcare facilities. This process is most crucial and also prone to errors. These errors in medication ordering can lead to time delays and shortages of essential medications required for patients forcing healthcare providers to opt for alternatives that may not be as effective as original medicine and not readily available when required.

Ultimately the primary motivation for the implementation of the application is to improve the procurement process without any disparities streamline the procurement process and reduce the manual intervention to overcome the issues that occurred in the legacy application. Real-time stock reports and quotation comparison process enables the procurement team to efficiently place orders and maintain stock in medical institutions.

II. EXSISTING WORK

The existing application for managing pharmacy purchase/ pharmacy procurement within healthcare facilities has several limitations that reduce the efficiency and usability of the existing application. The current application relies on the outdated software ASP which lacks new features and the current application is only supported in Internet Explorer which limits the user to use a particular browser.

The current system also lacks purchase order tracking which leads to confusion where the process is delayed and it also lacks the user interface which makes it difficult for users to interact. In the current application, the quotation comparison process is performed manually which may lead to disparities and may cause errors while selecting the best quotation from the quotations available.

The major disadvantage of the existing system is the application is built using ASP without Ajax support which affects the interaction and responsiveness of the application and generating purchase orders and GRN is a complex and time-consuming process in existing applications. Even for minor changes in PO or GRN, we need to navigate multiple pages which leads to a disjointed user experience and leads to potential errors and there is no report to check differences and modifications in stock.

III. PROPOSED WORK

The proposed system aims to revolutionize pharmaceutical procurement within healthcare facilities and aims to overcome the disadvantages of the existing system. The entire system is completely branched out into five modules namely

- Quotation Module
- Purchase Order Module
- Goods Received Note Module
- Stock Management Module
- Stock Supplier Return Module

The proposed system will incorporate advanced features and seamless integration with the existing inventory system. The current system will be replaced with basic software with a more advanced application. It will also incorporate real-time updates and enhance the communication with the inventory system and the new system is developed using Ajax to improve the responsiveness of the application and increase the overall performance.

The user interface has been enhanced to improve usability and make the user interaction much smoother thereby, improving the user- friendliness.

3.1. Application Flow

- The application flow starts from the indent which is raised from the pharmacy staff. Then the quotations received from the vendors are entered into the application.
- Once the quotations are entered, the best quotation from the quotations is finalized based on the MRP and PRT.
- Once the quotation is finalized then the purchase order is created based on the requirement of the items. The created purchase order is then sent for approval then the approved purchase orders are sent to vendors for item procurement.
- Goods Received Note is created after the goods are received from the vendor. Once the GRN and invoice are confirmed then the stock from main store is issued to sub-store.
- In case of any disparities in the amount of stock in the store, those disparities are resolved using Stock Adjustment one item at a time. When stock adjustment is to be done for multiple items then it could be done so using excel upload. Stock Supplier Return Module is there to return the near expired goods and items that have low margin and so on.

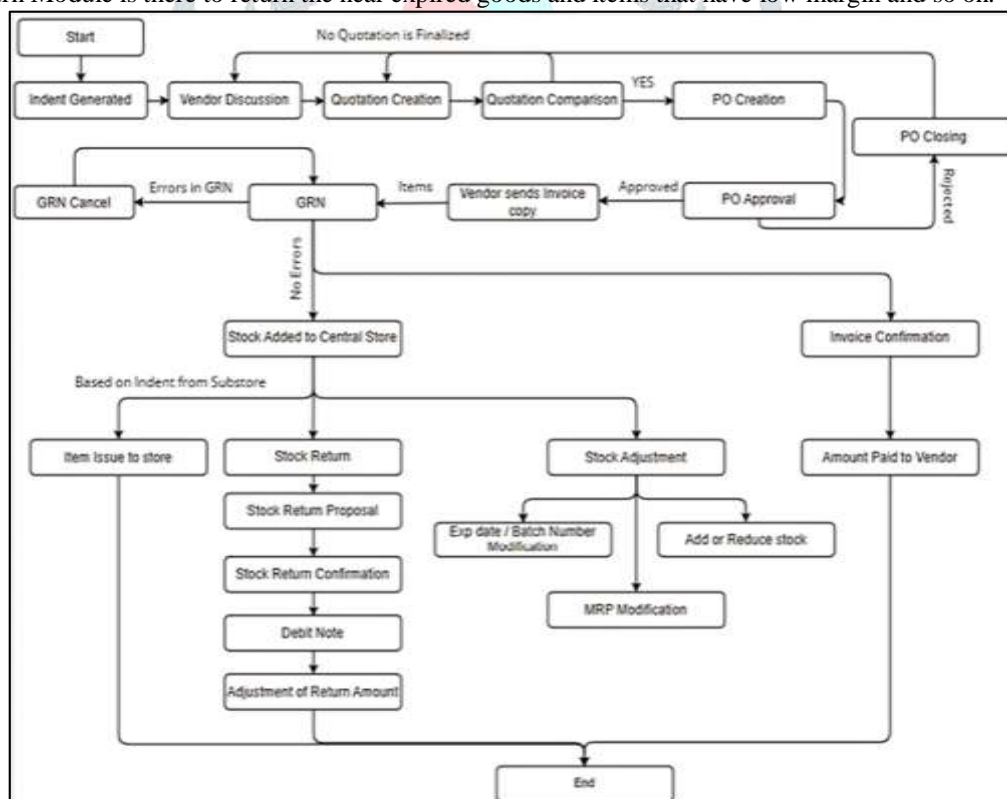


Figure 1 : Application Flow of Pharmacy Purchase Management System

IV. SOFTWARE REQUIREMENT

4.1. Development Environment

- **Programming Language:** C# (Version – 4.5.0)
- **Web Technologies:** Ajax, jQuery (Version – 3.5.1)
- **Database:** Oracle (Version – 11.2.0)
- **Integrated Development Environment:** Microsoft Visual Studio (Version - 2013)
- **Framework:** .NET Framework (Version – 4.5)

4.2. Frontend Technologies

- HTML (Version –5)
- CSS (Version - 3)
- JavaScript (Version – ES6)
- Semantic UI (Version – 2.4.1)
- jQuery (Version – 3.5.1)
- Ajax (Version – 3.5.1)

4.3. Backend Technologies

- C# (Version – 4.5.0)
- ASP.NET (Version – 4.5)
- ADO.NET (Version – 4.5)
- Oracle (Version – 11.2.0)

4.4. Other Tools and Libraries

- Entity Framework
- JSON
- NuGet Package Manager

V. RESULTS AND DISCUSSION

5.1. Entry Page of Application



Figure 2: Login Page

This is the Login page of application designed using ASPX and Ajax. Using this page with the valid credentials user can access the application. This is a live application developed for the pharmacy staff for procurement of the items needed for the pharmacy.

5.2. Quotation Module



Figure 3. Quotation Comparison Page

This Quotation Comparison page is included in the Quotation Module. This plays a major role in selecting the best quotation from various quotations from various vendors. Various quotations received for a particular medicine are compared using various parameters such as margin, purchase rate and maximum retail price. The indications on the quotations are displayed using symbols and colors, the difference between the comparison variables are indicated using red and green colors and If we select the symbols for indication then we use up and down arrow of color red and green respectively.

5.3. Purchase Order Module

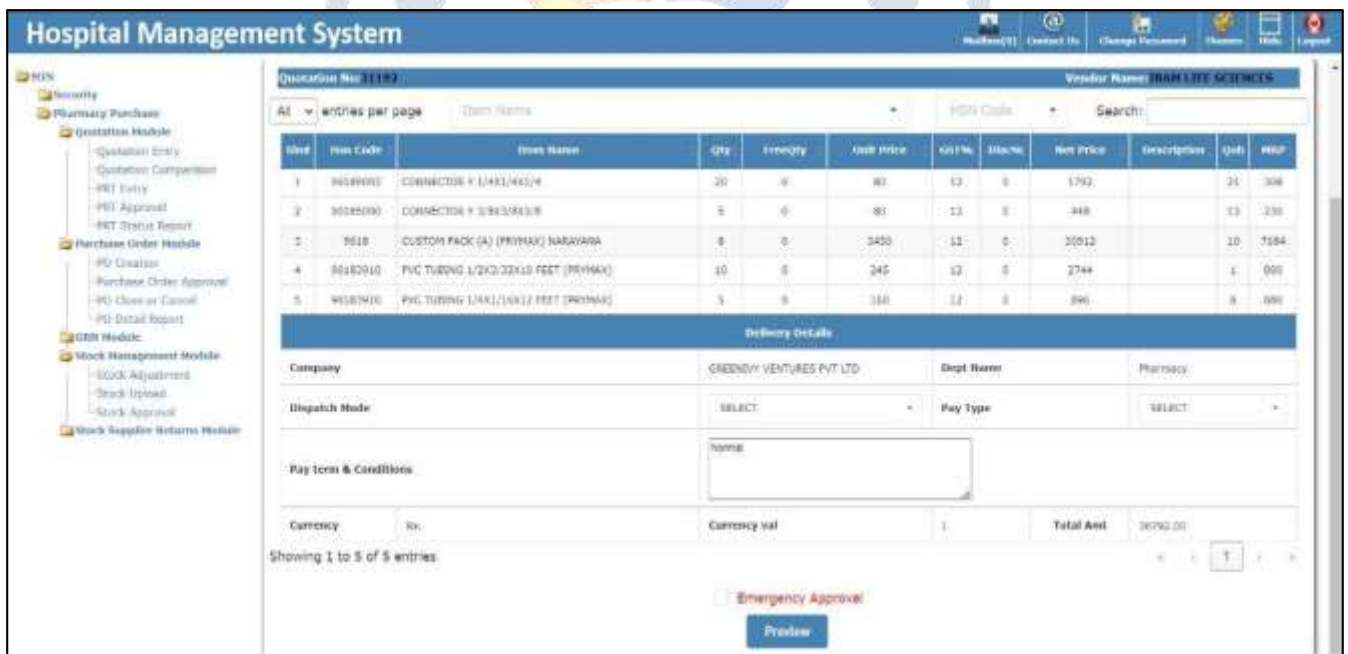


Figure 4. Purchase Order Creation

The Purchase Order Creation is the main entry page for the Purchase Order Module. Once the quotations are finalized based on the comparisons received then a purchase order is created from this module then the created purchase order is sent to the vendor once it is finalized. Before sending to the vendor the purchase order is approved by authorized users then sent to the vendor with the particulars needed based on the items.

5.4. GRN Module

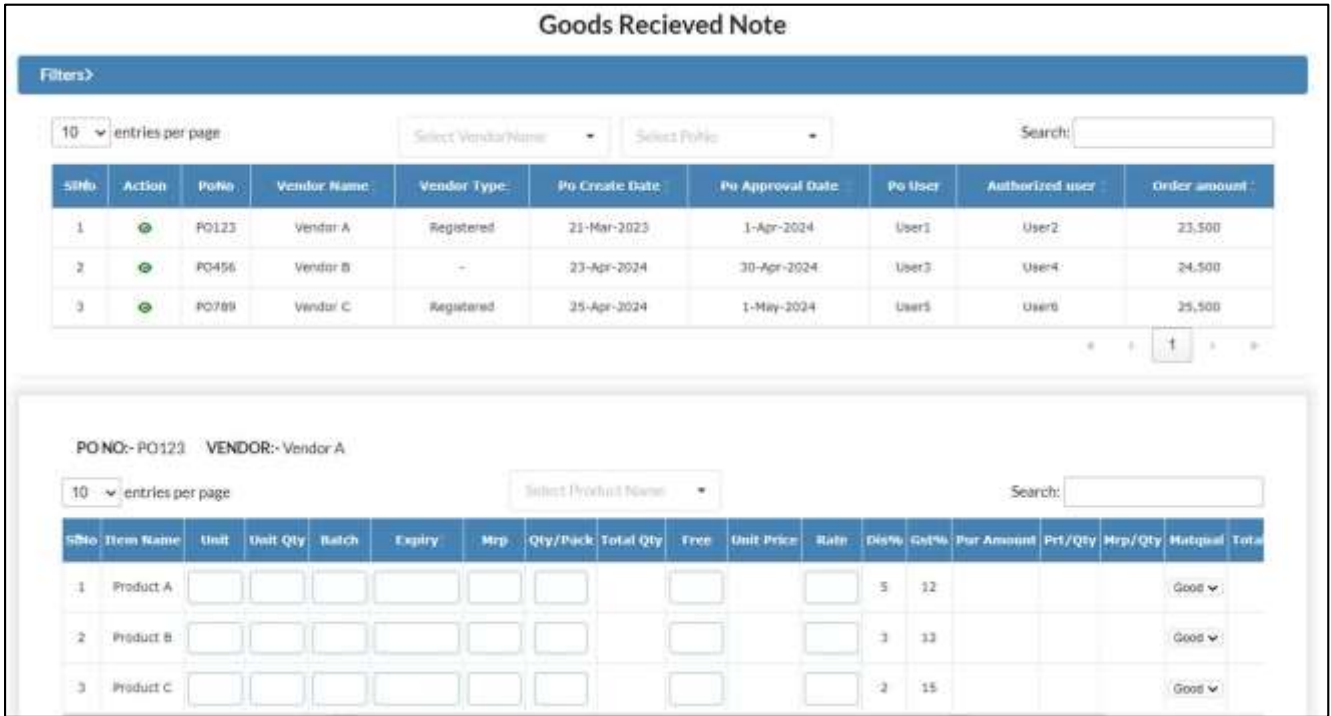


Figure 5 : Grn Creation

The Goods Received Note creation is entry page for the Good Received Note Module. When the purchase order is received by the vendor and the goods are received to the facility. The goods received note is generated. The goods received note consists of the quantity and the item name along with the item quality is entered. Then a Grn is generated to have a document for the received items.

5.5. Stock Adjustment Module

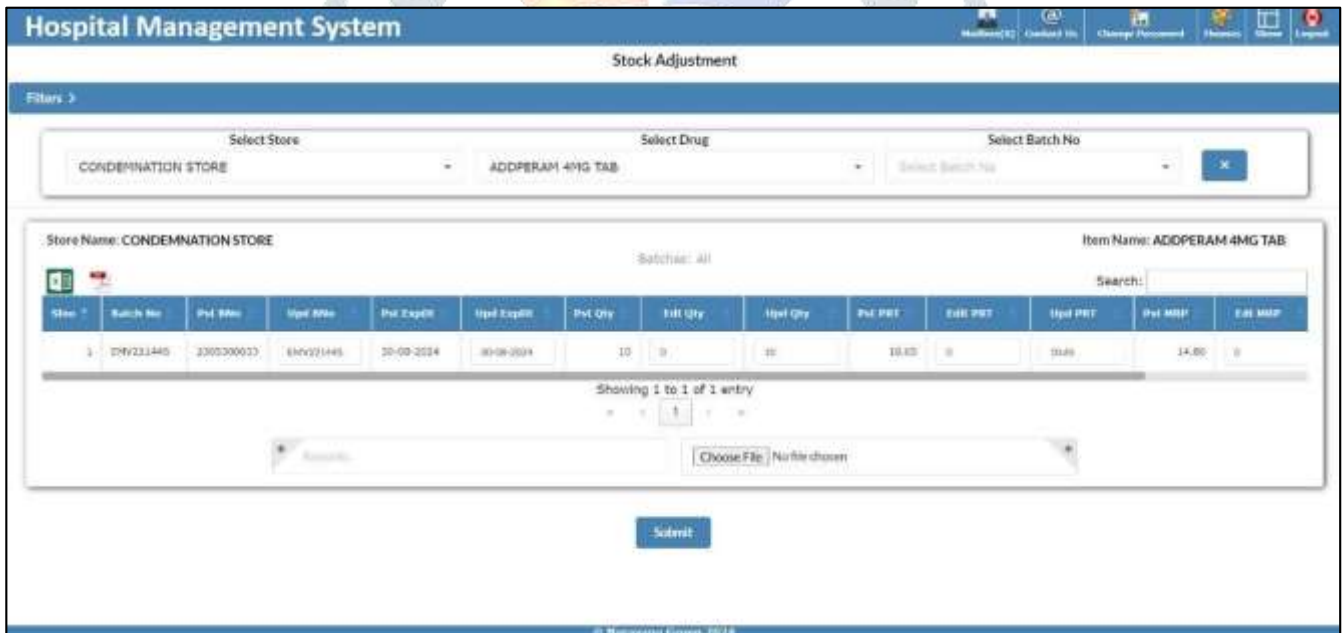


Figure 6 : Stock Adjustment Page

The Stock Adjustment Module plays a major role in procurement process. Generally there are some situations where there either the overstock or stock deficient problem occurs. When auditing is done then the stock is adjusted according to the stock present in the store. This module can also be used to adjust the PRT and MRP based on the increasing price of the item or decreasing price of the item.

5.6. Stock Return to Vendor Module

Item No	Item Name	Batch No	Expiry Date	Qty On Hand	Pct	Unit	Remanage	Return Amt	Company Name	Item Category
1	12002 LP TAB	222202240	MAY 2023	10	55.55	SA			ALABIC LIFE SCIENCES PVT LTD	TABLTS
2	12002 LP TAB	58312	AUG 2022	14	55.55	SA			ALABIC LIFE SCIENCES PVT LTD	TABLTS

Total Return Amount:

Reason for Return:

Remarks:

Save

Figure 7 : Stock Return Proposal

The Stock Return To Vendor page is used to return the items that are either damaged or expired. The items that are required to return are selected and the quantity that is required to return is added in this page. After this a proposal is sent to vendor then the stock approved by the vendor is sent back to the vendor and amount is either return or adjusted in next purchase to make a note of it debit note is generated.

VI. CONCLUSION

The pharmacy purchase management system is a robust application that resolves the errors in the pharmacy procurement process and optimizes the procurement process and helps in reducing the human intervention. The Quotation module plays a crucial role in deciding multiple quotations from various vendors. The purchase order module plays a crucial role in pharmacy purchase management system it is mainly used in generating the order for required items based on the need of the medical institutions.

The grn module helps in validating the received goods form the vendors, ensuring the legit invoices are generated and issuing the items to the sub-stores or pharmacies present in medical institutions. The supply returns module is used to return the damaged goods to the vendor ensuring proper documentation and efficient processing.

The key benefits include enhanced efficiency, increased accuracy, proper documentation in every stage if procurement process, foster relation between the medical institution and the vendors. The system ensures all the transactions are well documented reducing the risk of non-compliance. This system contributes for better resource management, cost saving and overall performance in pharmacy sector.

VII. ACKNOWLEDGEMENT

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