

## Web-Based Application Named “Pharm InfoSoft” for Pharmacy

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**Annotation:** This project aims to develop a web-based application named “Pharm InfoSoft” for pharmacy. Pharm InfoSoft refers to the system and processes to manage pharmacy stock with the involvement of the Technology Systems. This project’s scope includes the creation of APIs to retrieve, store, and modify Inventory & Billing details that persisted in the database. This project is categorized into individual entities for Inventory, invoices, and customers. This system solves different problems affecting direct sale and purchase management. The Inventory and Billing module Tracks the product availability and generates Invoices. The primary purpose of inventory management is to ensure there are enough goods or materials to meet demand without creating overstock or excess Inventory. Automated invoicing helps individuals manage the entire payment process, from gathering data to creating and sending bills. The entities involved in this project and their corresponding fields are Inventory, Inventory Item, Invoice, Invoice Item and customer.

**Keywords:** Developing a web-based, Application, Pharm InfoSoft, Pharmacy.

### Introduction:

The endeavor's chief point is directing the informational index of the pharmacy shop [6]. This endeavor is an information on the arrangement and execution of a Pharmacy's Inventory and Billing System [7-11]. This is done by making an informational collection of the available drugs in the shop. The fundamental mark of this system is to foster accuracy further and further develop security and usefulness in the pharmacy [12]. This adventure hopes to cultivate programming for the suitable organization of a pharmacy. Pharm InfoSoft structure is significant to stay aware of the right data base by giving a decision to revive the prescriptions in stock [13]. This is a pharmacy's Inventory and the leaders' structure used to regulate most pharmacy related works out [14-21].

It is a PC based framework that assists the Pharmacist with further developing stock administration, cost, clinical security, etc [22]. The product can print solicitations, bills, and receipts etc. The framework will likewise give a report showing the rundown of items expiries after a predefined date

before the item terminates. The framework administrations and objectives are laid out by conference with the framework client [23]. It also includes manual passage upon the appearance of new clusters of medications and medication development out of the drug store for a specific period [24]. The drug store and the board framework are being constructed. This framework is strong, coordinated innovation. Here it gets data about the medications, for example, expiry endlessly, date bought, the number of medication types left, and the area of medication in the drug store [25-33]. The executives' framework manages to keep up with drugs and consumables in the drug store unit in the drug store. This Pharm InfoSoft framework is easy to understand [34-39].

### Literature Review

Kumar A et al., [1] the significant expectation of this study is to investigate the techno association climate menu (TOE) factors that impact retail outlet'stion of innovative applications in India. The exploration adds to the expanding scholarly writing on innovation application reception by utilizing factors inside the TOE system to clear up coordinated retail outlets' goals for embracing such advancements. Abu Zwaïda et al. is to; depict current information holes that exist about the elements which influence the inventory network; this makes it conceivable to play out a wide survey of Canadian medical clinic drug stores and comprehend how proceeded disturbance happened this interaction and caused drug deficiencies [40-45]. Materials accessibility and expansions sought after cause drug deficiencies. The proposed deliberate approach features potential answers for the executives' inventory network that could cause drug deficiencies in Canada [46].

Jovanović Lješković et al. [3] portrays that Medicine deficiencies in Serbia have been available for a long time; however, writing information is scant. Our review expected to understand the current circumstance in Serbia, audit the EU activities while overseeing deficiencies, and perceive a bunch of likely measures [47-56]. A short overview was led among 500 drug specialists in open drug stores in 23 urban areas in Serbia. Our exploration showed that even though Serbia is, in certain viewpoints, behind EU nations in regards to the ways to deal with beat medication deficiencies, headway can be made inside a brief period by unambiguous very much designated activities [57]. Pastry specialist Asan [4] delineates the planning and execution of a Pharmacy Management System with a stock ready framework. The essential point is to develop precision further and improve security and productivity in the drug store. Today the executives are one of the fundamental highlights, everything being equal [58-65]. The executives give complexity to play out any assignment in a specific structure. This is a drug store the board framework; it oversees most drug store related exercises [66].

Aditya A. Pande, S. Sabihuddin [5] Material administration is a basic part of the development business. Associations need to get the impacts of amicable materials on the executives' strategies on the viability of undertaking execution [67-77]. In this venture, we have arranged a plan of material administration in the development business for the structure project [78]. We are additionally leading industry overviews and deciding the different configurations for development material administration [79-87].

### Existing System:

A pharmacy management system provides sophistication to perform any task in a particular form [88]. This is a pharmacy management system used to manage most pharmacy-related activities. The existing system uses outdated technology and provides a friendly user interface for the client so that not everyone can use it [89-95]. There is a delay in invoice generation, and the customers have to wait for their bills, which sometimes affects the sale. It is not cost-effective for small scale business owners [96-101].

**Project Proposal:**

This project is to establish a system for pharmacy shops to improve the performance and efficiency of pharmacy shops management [102-111]. To achieve this goal effectively, some specific objectives should be implemented; the following are specific objectives for this project.

- To provide easy access to customers management
- To provide easy accessibility of sales reports
- To provide easy accessibility of stock reports
- To provide easy accessibility of printing and prepare invoices for customers
- Printing of customers, bills, sales, purchases and all inventory reports.
- To minimize human errors.
- To provide optimal drugs inventory management by monitoring the drugs' movement in the pharmacy unit.

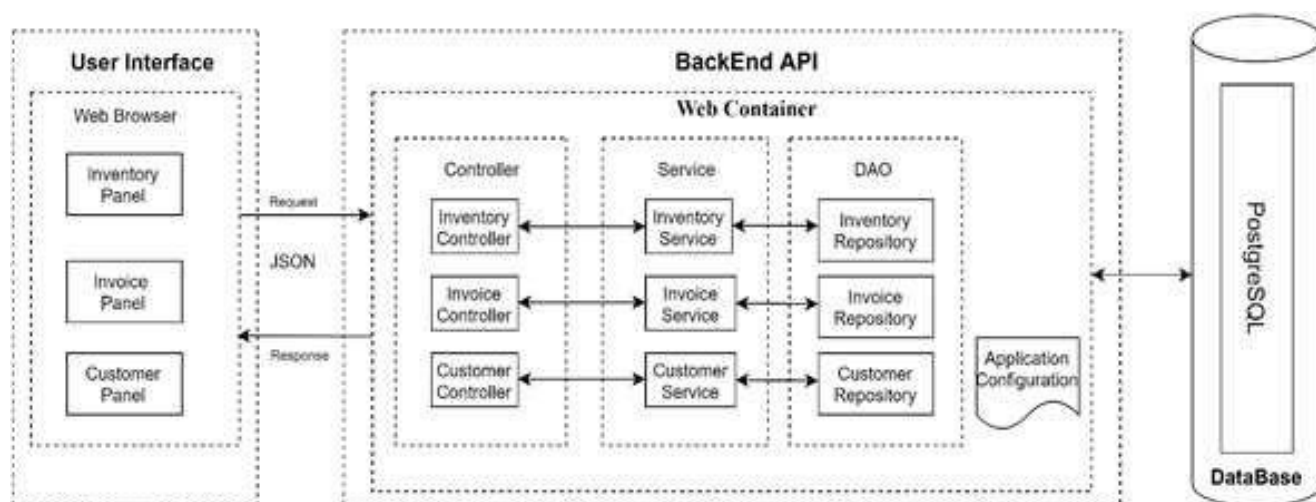
A great system for storing data and maintaining and organizing the use and process of medications in pharmacy should be the abstract content of this management system project [112-123]. This must be a computer software system that has been programmed to perform the various tasks required in the operation of a pharmacy [124]. This system will improve the company's efficiency and enable storing of digital records [125-131].

**Architecture Diagram****Application Architecture:**

Architecture describes the behaviour of components used in the system and how they interact with each other and the users [132-139]. Our Project Consists of both:

- UserInterface
- Back EndAPI

The front-end of this application is the GUI component which accepts user inputs through a web browser [140-147]. A web server where the API is deployed and the data stored from the application's backend (figure 1).



**Figure 1: Architectural Diagram**

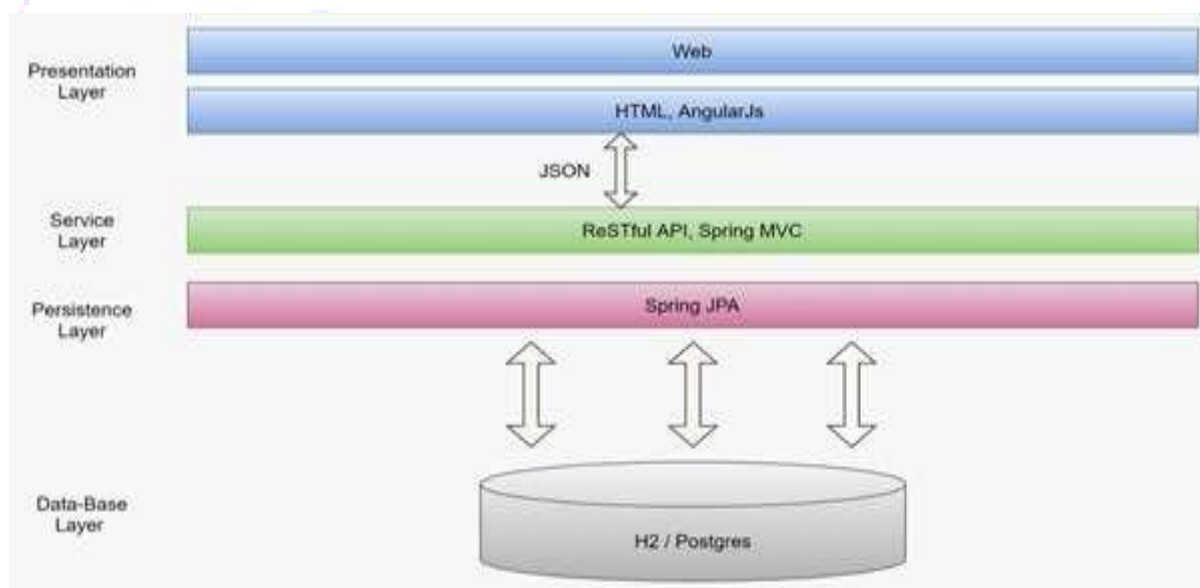
The Pharm InfoSoft consists of three modules, namely,

- Inventory module
- Invoicemodule
- Customermodule

These three panels store the data from the client-side server and proceed to the next on DB in UI [148]. This system stores the stock of drugs in the Inventory panel, and then the customer details are stored and processed in the Customer panel [149-155]. When the users from the client-side server operate the system (i.e., the request from Users) is passed in to the Backend servers of APIs through the web browsers [156-161]. The interchanges will occur through the web server as a Restful web administration in JSON design [162]. JSON is addressed as JavaScript Object Notation. It is a standard message-based design addressing organized information in light of JavaScript object linguistic structure [163-171]. For instance, they send a piece of information from the server to the client [172]. Thus, it may be shown on a website page or the other way around [173-179]. The UI sends the solicitation and gets the reaction through the internet browser. The backend APIs process has web holders process the given solicitations back to the client's reaction [180]. The information base looks at information accessibility; it likewise stores and recovers the information [181-185].

### System Architecture:

The framework design is the calculated model of programming that characterizes the framework's construction, conduct, and perspectives [186-191]. A framework design comprises framework parts and the sub-frameworks fostered that will cooperate in carrying out the general framework (figure 2) [192].



**Figure 2: System Diagram**

The technical entities involved in this project are listed in the subsequent section [193-196]. The attributes of each entity and their types with sample values are also specified.

### Data Access Layer:

A database needs to be configured with the required schema for Inventory and Billing systems. Tables and columns corresponding to the entities listed in the subsequent section are to be created. Commands to

access data should be written as required.

### Business Layer:

APIs that can perform CRUD operations on the entities involved in this system need to be developed and accessible to the front-end components.

### Presentation Layer:

An interactive interface needs to be developed to create web pages that access the backend APIs and perform operations on the entities based on user inputs. The relationship between the entities described below should be represented in an ER diagram and presented in the documentation.

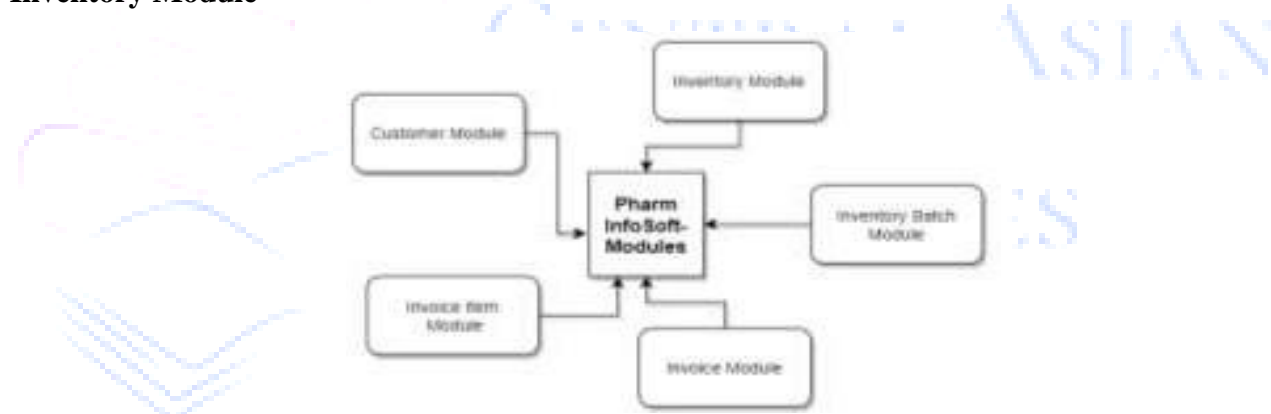
### Modules:

The modules present in this project,

- Inventory Module
- Invoice Module
- Customer Module

Pharm InfoSoft System for Pharmacy manages the following data:

### Inventory Module



**Figure 3:** Module

In a pharmacy, Inventory represents the medicines, healthcare products and other drugs procured to be sold to the consumers. Stocks of Inventory are maintained in the store. The inventory module has some set of entities, as shown in the table refer Figure 3.

**Table 1:** Entity Table for Inventory

Column Name	Data Type	Example
ID	Number	1
NAME	String	ABC Capsule
PACK	String	10X10TAB
CODE	String	AB123
COMPANY	String	Abbot
TAX_SLAB	Number	5
MFD_BY	String	Abbot Laboratories
IS_NARCOTICS	Boolean	True/False

### Inventory Batch Module



Inventory Batch is nothing but a sub-module of Inventory, and it does the same work as the Inventory module does. The inventory batch module has some entities, as shown in the table 2.

**Table 2:** Entity Table - Inventory Batch Module Invoice Module

ID	Number	1
INVENTORY_ID	Number	1
BATCH	String	GST1559
MFG_DATE	Date	2021-05-24
EXPIRY_DATE	Date	2021-12-24
PRICE_TO_STOCKIST	Number	100
PRICE_TO_RETAILER	Number	120
MRP	Number	140

An invoice is a bill or receipt generated upon purchasing products from the pharmacy. This is the end product of the billing process. The invoice module has some entities, as shown in the table 3.

Column Name	Data Type	Example
ID	Number	1
INVOICE_DATE	Date	2021-06-07
TERMS	String	Cash/Credit
INVOICE_NUMBER	String	20210607_1
DOCTOR	String	Ram
INVOICE_AMOUNT	Number	1000
DISCOUNT	Number	100

**Table 3:** Entity Table – Invoice Module

### Invoice Item Module

Invoice Item is a sub-module of Invoice, and it does the same work as the Invoice module. The Invoice Item module has some entities, as shown in the table 4.

**Table 4:** Entity Table for Invoice Item Module Customer Module

Column Name	Data Type	Example
ID	Number	1
INVOICE_ID	Number	1
INVENTORY_BATCH_ID	Number	1
PACKS	Number	1
INVOICE_ITEM_AMOUNT	Number	100

The end-user who purchases products from the pharmacy is the customer. The system maintains the details of a customer. Inventory and Billing System for Pharmacy should provide the interface and APIs required to fetch, modify, add and remove data related to the abovementioned entities. The Customer module has some entities, as shown in the table 5.

**Table 5:** Entity Table – Customer

ID	Number	1
CUSTOMER_NAME	String	Raj
AGE	Number	18
GENDER	String	Male/Female/Other
ADDRESS	String	Madurai
CONTACT	String	+91 9876543210
CUSTOMER_UID	String	ABCDEF1234F
CUSTOMER_UID_T YPE	String	Aadhaar/PAN/Licens e/Passport

**Technical Specification**

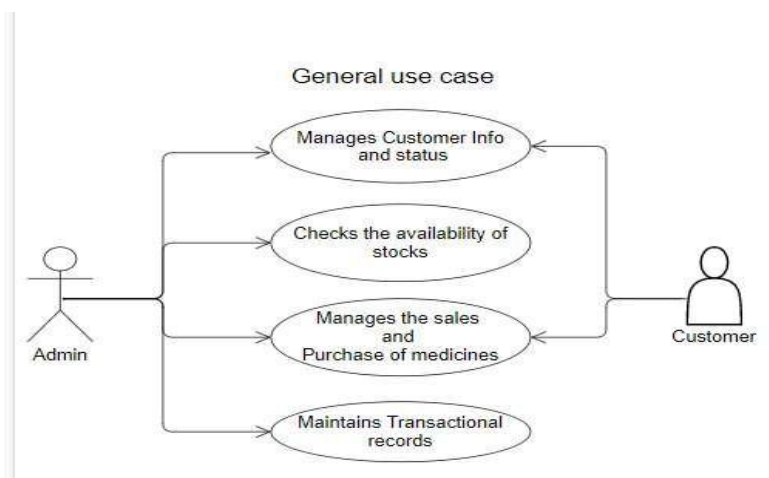
- Operating System: WindowsXP/7/8/10
- FrontEnd: AngularJS
- BackEnd: Java, RESTful API, Spring Boot,Tomcat
- DataStore : H2 (in-memory for development purpose) / Postgres (for Production)
- ToolKit:Eclipse

**Hardware Specification**

- ProcessorType: Pentiumi3
- Speed: 3.40GHZ
- RAM: 4GB DD2RAM
- HardDisk:500GB
- Keyboard: 101/102 StandardKeys
- Mouse: OpticalMouse

**UML Diagrams****Use Case Diagram:**

A utilization case chart is a gathering of entertainers, a bunch of purpose cases encased by a framework limit correspondence, a relationship between the entertainers and the utilization cases, and speculation among the utilization cases. A utilization case chart shows the connection between the entertainers and the utilization cases inside the framework (figure 4).

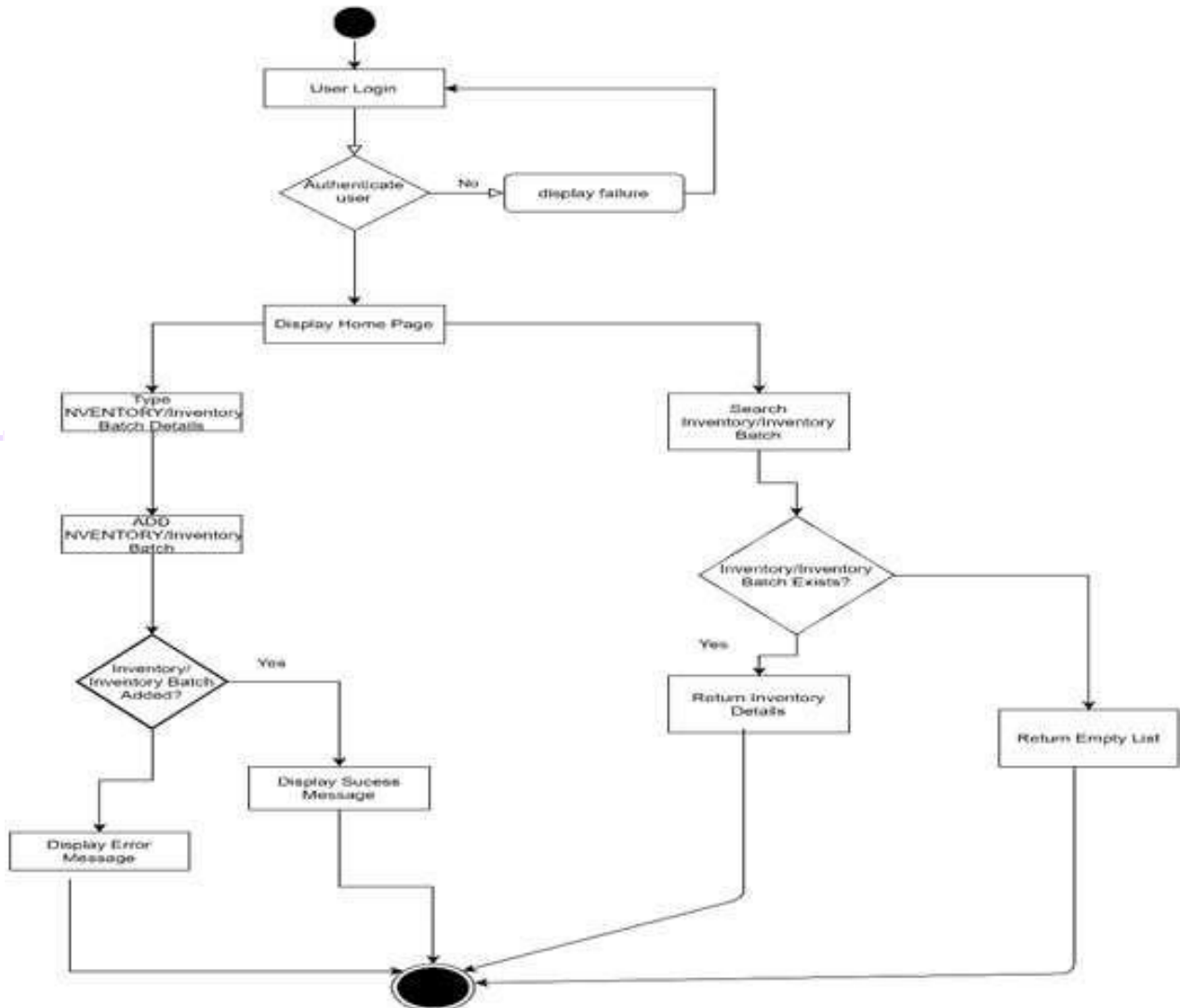
**Figure 4:** Use Case Diagram

**Data Flow Diagram:**

A Data Flow Diagram (DFD) is a conventional visual portrayal of the data streams inside a framework. It shows how information enters and leaves the framework, what changes the data, and where information is put away. DFD might be utilized to play out a framework or programming at any degree of deliberation. DFDs might be divided into levels that address expanding data stream and practical detail.

For Inventory Module,

- A module where the user can add, store, retrieve and delete the Inventory details
- To monitor the availability of the products (figure 5)

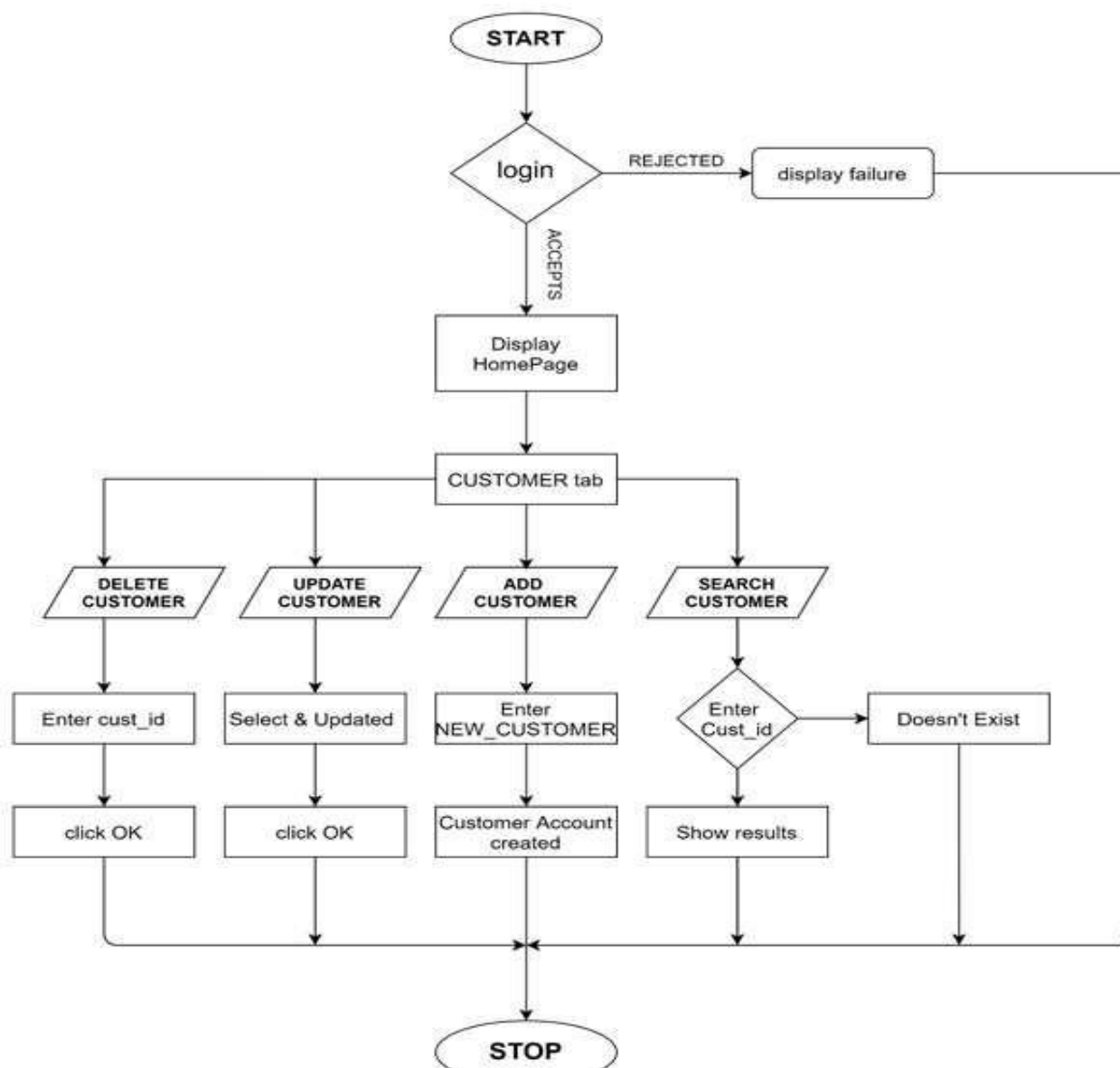


**Figure 5: DFD – Inventory Module**

**Customer Module**

- The user can store and update the customer details
- To track the purchase history of a customer

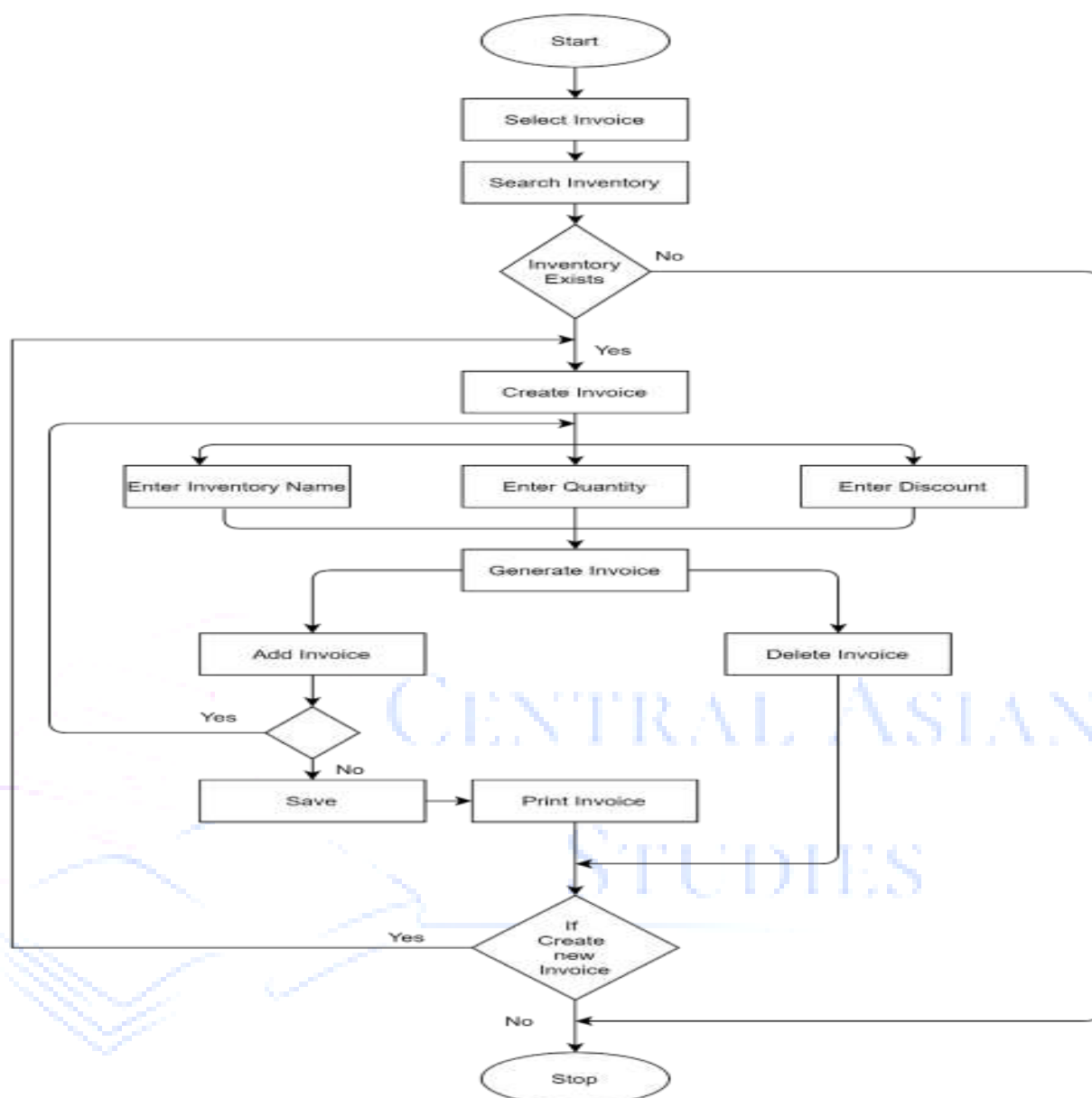




**Figure 6:**Invoice module

### DFD – Customer Module

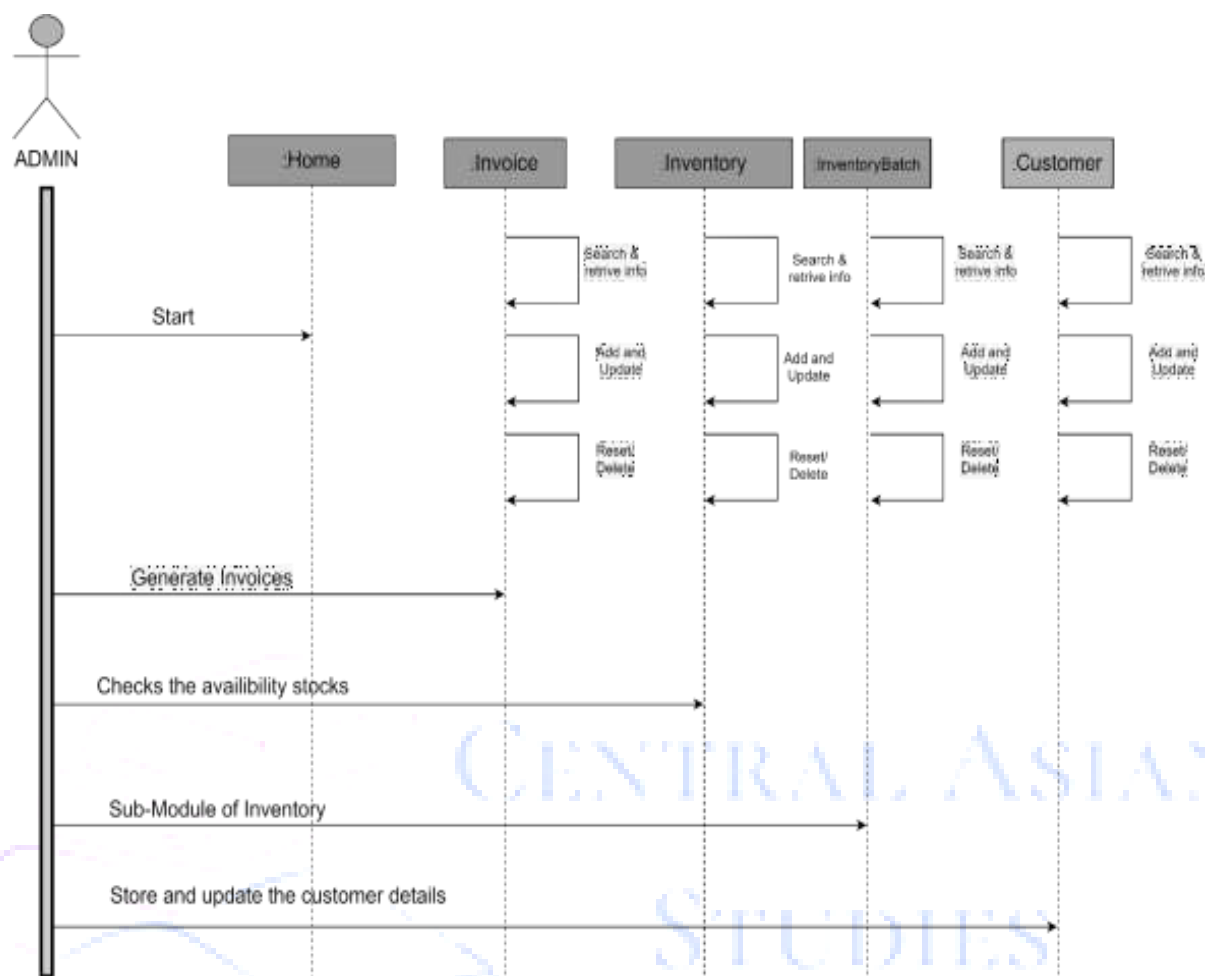
This module helps the user generate the Invoice with the selected Invoice Items. To get the stored invoice details (figures 6 to 7).



**Figure 7: DFD – Invoice Module**

### Sequence Diagram:

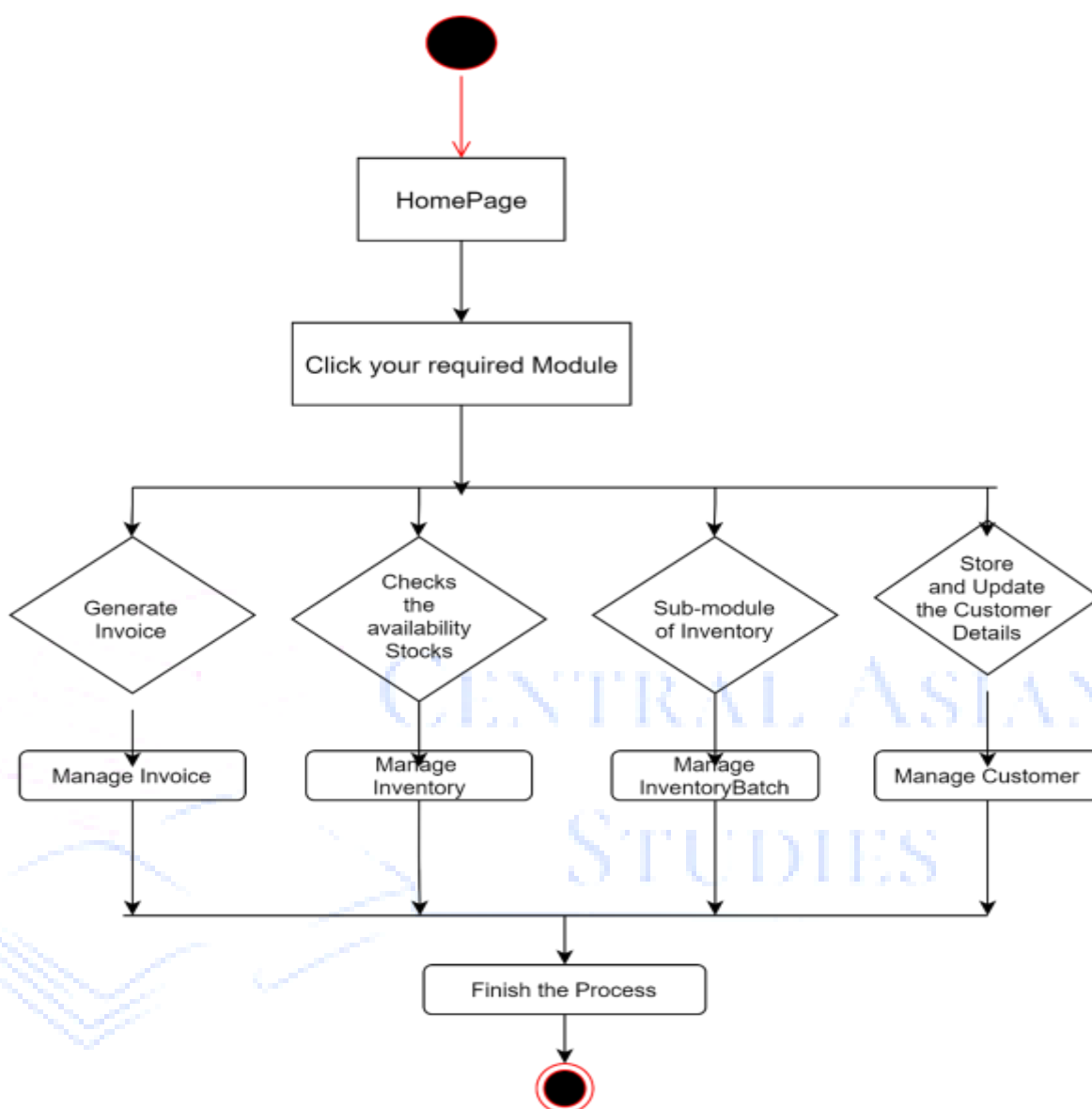
A grouping chart shows object associations organized in a period of succession. It portrays the articles and classes associated with the situation and the grouping of messages traded between the items expected to complete the usefulness of the situation. Succession graphs are commonly connected with use cases acknowledged in the Logical View of the framework being worked on. Arrangement outlines are here and there, called occasion charts or occasion situations (figure 8).



**Figure 8:** Sequence Diagram

#### ActivityDiagram:

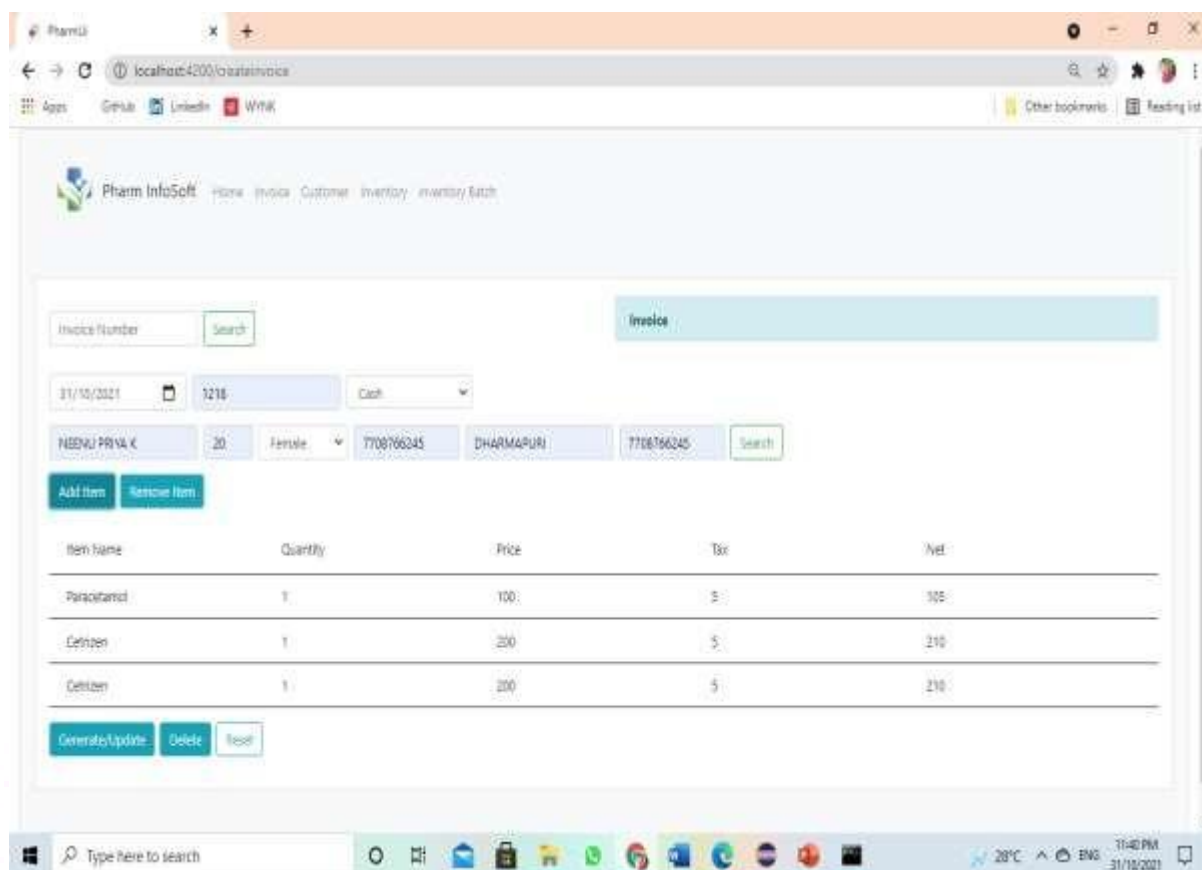
Movement charts outwardly present a progression of activities or control stream in a framework like a flowchart or an information stream graph. Movement charts are, in many cases, utilized in business process demonstration. They can likewise be portrayed in a utilization case outline (figure 9).



**Figure 9:** Activity Diagram

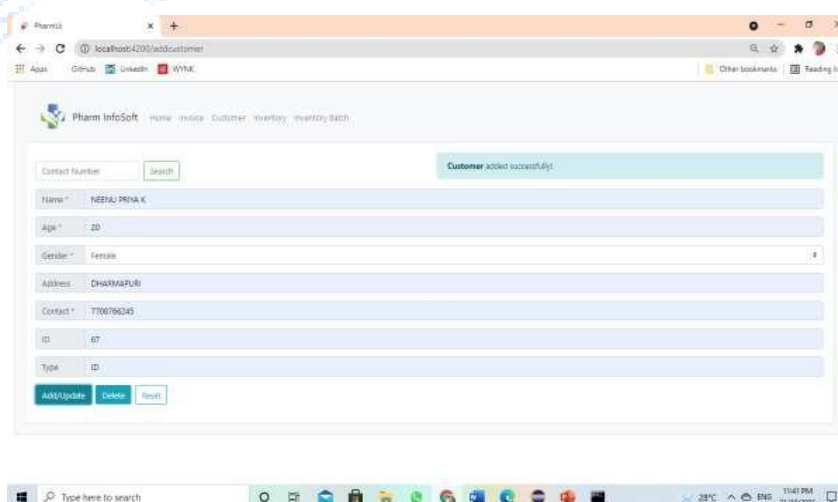
### Screenshots and Description

Invoice Page this module helps the user generate the Invoice with the selected Invoice Items. And to get the stored invoice details (figure 10).



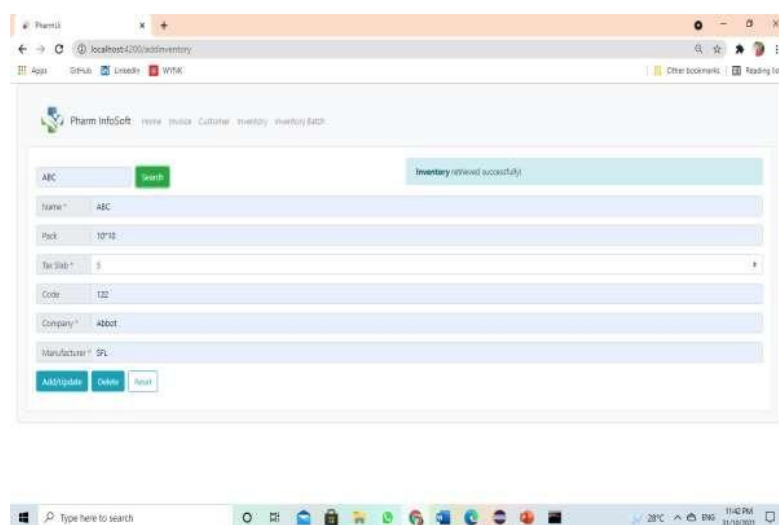
**Figure 10: Invoice Page**

The customer Page, used for the user, can store and update the customer details. To track the purchase history of a customer (figure 11).



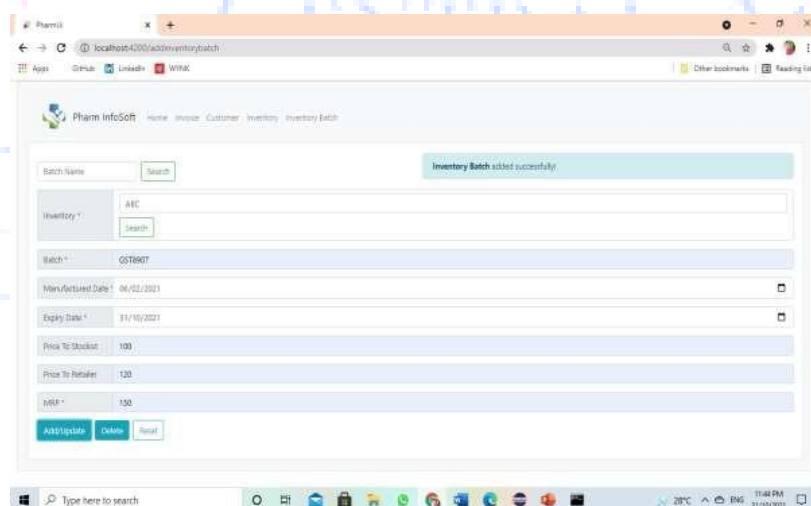
**Figure 11: Customer Page**

Inventory Page, A module where the user can add, store, retrieve and delete the Inventory details. To monitor the availability of the products (figure 12).



**Figure 12: Inventory Page**

Inventory Batch Page is a sub-module of Inventory where we can fetch and retrieve a particular inventory detail (figure 13).



**Figure 13: Inventory Batch Page**

### Conclusion:

Pharm InfoSoft alludes to the framework and cycles to oversee drug store stock with the contribution of the Technology Systems. This task's degree incorporates the production of APIs to recover, store, and adjust Inventory and Billing subtleties that endured in the information base. This task is arranged into individual substances for Inventory, solicitations, and clients. This framework takes care of various issues influencing direct deals and buying executives. The Inventory and Billing module Tracks the item accessibility and creates Invoices. The basic role of stock administration is to guarantee an adequate number of products or materials to fulfil a need without creating an overload or abundance of Inventory. Mechanized invoicing assists people with dealing with the whole installation process, from social affairs information to making and sending bills. The substances engaged with this venture and their relating fields are Inventory, Inventory Item, Invoice, Invoice Item and client.



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