

Medical Inventory Management

Introduction:

Salesforce is a powerful **cloud-based Customer Relationship Management (CRM)** platform designed to streamline business processes, improve collaboration, and enhance customer relationships. With its vast suite of automation, analytics, and customization tools, Salesforce enables organizations to operate efficiently across diverse industries — including healthcare. In this project, Salesforce CRM has been leveraged to design and implement a **Medical Inventory Management System**. The goal is to automate the handling of medical supplies — including medicine stock, supplier management, purchase orders, and expiry tracking — for hospitals and pharmacies. By using Salesforce features such as **Custom Objects, Workflows, Process Builder, Apex Triggers, Validation Rules, Flows, and Dashboards**, this system ensures:

- Real-time inventory visibility
- Automated reorder alerts
- Expiry date monitoring
- Streamlined communication between administrators, suppliers, and pharmacists

This project highlights how Salesforce CRM can transform healthcare operations by improving efficiency, reducing manual errors, and enhancing data-driven decision-making.

Objectives

The primary objectives of the Medical Inventory Management System are:

1. Centralized Inventory Data

Maintain detailed, structured records of medicines, suppliers, purchase orders, and stock movements within Salesforce.

2. Automated Reorder Alerts

Generate notifications when medicine stock falls below a defined minimum threshold, ensuring timely restocking.

3. Expiry Tracking

Continuously monitor expiry dates and send alerts to staff for disposal or replacement of expired medicines.

4. Supplier Management

Record supplier profiles, contact details, payment status, and purchase history to streamline vendor relationships.

5. Operational Efficiency

Minimize manual tracking and data entry through automation and Salesforce Flows.

6. Role-Based Access Control

Secure data by defining roles such as Administrator, Pharmacist, and Store Manager with appropriate permissions.

7. Data-Driven Insights

Generate interactive dashboards and reports for stock movement, supplier performance, and usage trends.

Ideation

Originality of Ideas:

Traditional inventory systems rely on spreadsheets or offline software, leading to data inconsistencies, limited automation, and human errors. This project innovatively integrates **Salesforce CRM** into the medical domain, offering a **cloud-based, automated, and scalable solution** for healthcare inventory operations. It bridges the gap between medical logistics and intelligent CRM systems.

Feasibility of Ideas:

The project is highly feasible using the **Salesforce Developer Edition**, which provides access to tools such as:

- **Custom Objects and Relationships**
- **Apex Classes and Triggers**
- **Flows, Process Builder, and Validation Rules**
- **Reports and Dashboards**
- **Role and Permission Management**

The system is cost-effective, requiring no additional hardware, and can scale easily for **multi-branch hospitals or pharmacy chains**.

Requirement Analysis:

Completeness of Requirements

The requirements were gathered through consultation with hospital administrators, pharmacists, and supply managers to ensure all operational needs were covered. Key functional areas include:

- **Medicine Management** — Track details like name, category, batch number, price, stock quantity, and expiry date.
- **Supplier Management** — Store supplier details, contact info, payment terms, and performance history.
- **Stock Tracking** — Log inventory transactions such as purchases, consumption, and returns.
- **Reorder and Expiry Alerts** — Automatically notify staff for restocking or removal of expired items.
- **Purchase Order Management** — Manage purchase orders with automatic total calculations and supplier linkage.
- **Reports and Dashboards** — Provide visual insights into inventory levels, supplier performance, and usage trends.

Project Design:

Design Completeness

The Salesforce configuration includes the following components:

Custom Objects

1. **Medicine (Product)** – Holds details about each medicine.
2. **Supplier** – Manages supplier contact and transaction information.
3. **Purchase Order** – Tracks orders placed with suppliers.
4. **Order Item** – Line items linking medicines to purchase orders.
5. **Inventory Transaction** – Logs stock changes (inflow/outflow).

Relationships

- **Supplier → Purchase Order:** Lookup Relationship
- **Purchase Order → Order Item:** Master-Detail Relationship
- **Medicine → Order Item:** Lookup Relationship

Page Layouts & Tabs

- Custom layouts for each object ensure clarity and ease of use. □ Tabs organized within a **Lightning App** for unified access.

Lightning App Components

- Home Page with KPIs and charts.
- Tabs for Medicines, Suppliers, Orders, and Reports. □ Quick Action Buttons for adding new records.

Innovation and Design

- **Lightning App Builder** was used to create a visually appealing and interactive interface.
- **Flows and Validation Rules** ensure data accuracy.
- **Automation Tools** handle reordering, expiry alerts, and total calculations.
- **Dashboards** visualize stock levels, supplier performance, and inventory trends in real-time.

Salesforce Development – Backend Milestone 1: Salesforce Developer Account Creation

Milestone-1

Activity 1: Creating Developer Account:

Creating a developer org in salesforce.

1. Go to <https://developer.salesforce.com/signup>
2. On the sign up form, enter the following details.
 3. Role : Developer
 4. Company : College Name
 5. County : India
 6. Postal Code : pin code
 7. Username : should be a combination of your name and company
This need not be an actual email id, you can give anything in the format username@organization.com Click on sign me up after filling these.

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Company*

Milestone-2

The screenshot shows the Salesforce Setup Home page. The left sidebar includes links for Setup Home, Service Setup Assistant, Multi-Factor Authentication Assistant, Release Updates, Lightning Experience Transition Assistant, Salesforce Mobile App, Lightning Usage, Optimizer, and Administration (Users). The main content area displays three cards: "Get Started with Einstein Bots" (Launch an AI-powered bot to automate your digital connections), "Mobile Publisher" (Use the Mobile Publisher to create your own branded mobile app), and "Real-time Collaborative Docs" (Transform productivity with collaborative docs, spreadsheets, and slides inside Salesforce). A "Create" button is located in the top right corner of the main content area.

1. Go to the setup page >> type Tabs in Quick Find bar
2. Click on tabs
3. Click on New (under custom object tab).
4. Select Object(Product) >> Select the tab style
5. Click on Next >> (Add to profiles page) keep it as default >> Click on Next (Add to Custom App) uncheck the include tab
- .

6. Make sure that the Append tab to user's existing personal customizations is checked.

7. Click save

Custom Tabs

You can create new custom tabs to extend Salesforce functionality or to build new application functionality.

Custom Object tabs look and behave like the standard tabs provided with Salesforce. Web tabs allow you to embed external web applications and content within the Salesforce window. Visualforce tabs allow you to embed Visualforce pages. Lightning Component tabs allow you to add Lightning components to the navigation menu in Lightning Experience and the mobile app. Lightning Page tabs allow you to add Lightning Pages to Lightning Experience and the mobile app.

Custom Object Tabs

No Custom Object Tabs have been defined

Web Tabs

No Web Tabs have been defined

Visualforce Tabs

No Visualforce Tabs have been defined

Activate Windows

Milestone-3

Step 1. Enter the Details

Step 1 of 3

Select an existing custom object or [create a new custom object now](#).

Object: Product

Tab Style: Stethoscope

(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: None

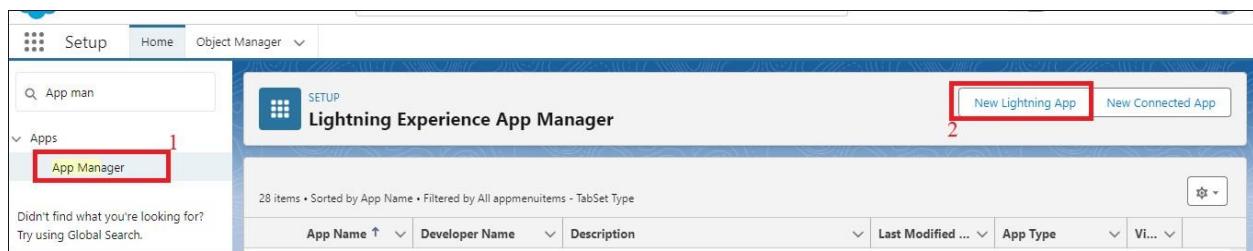
Description:

Next Cancel

Milestone 4- The Lightning App:

Activity 1: Create a Lightning App for Medical Inventory Management

1. From Setup, enter App Manager in the Quick Find and select App Manager.
2. Click New Lightning App.
3. Enter Medical Inventory Management as the App Name >> Click on upload image and add an image related to Medical Inventory then click next
4. Under App Options, leave the default selections and click next.
5. Under Utility Items, leave as is and click Next.
6. From Available Items, select Products, Purchase Orders, Order Items, Inventory Transactions, Suppliers, Reports, and Dashboards and move them to Selected Item and Click Next.
7. From Available Profiles, select System Administrator and move it to Selected Profiles.
8. Click Save & Finish.



Milestone 5- Fields:

To create fields in an object:

1. Click the gear icon and select Setup. This launches Setup in a new tab.
2. Click the Object Manager tab next to Home.
3. Select Product custom object.
4. Select Fields & Relationships from the left navigation
5. Click on New
6. Select Text field, click Next
7. Enter Field Label as “Product Name” and Length 255.
8. Select Required Field.
9. Click Next, Next, then Save & New.

The screenshot shows the Salesforce Object Manager interface. At the top, there's a navigation bar with 'Setup', 'Home', and a dropdown labeled 'Object Manager'. A red box surrounds the 'Object Manager' dropdown. Below it, the main area is titled 'Object Manager' and shows a table of objects. One row for 'Product' is highlighted with a red box; its API name 'Product_c' is also highlighted with a red box. The table includes columns for Label, API Name, Type, Description, Last Modified, and Deployed.

LABEL	API NAME	TYPE	DESCRIPTION	LAST MODIFIED	DEPLOYED
Fulfillment Order Product	FulfillmentOrderLineItem	Standard Object			
Opportunity Product	OpportunityLineItem	Standard Object			
Order Product	OrderItem	Standard Object			
Product	Product_c	Custom Object		18/06/2024	✓
Product	Product2	Standard Object			
Product Attribute	ProductAttribute	Standard Object			

Milestone 6 -Editing of Page Layouts:

Activity 1: To edit a Page Layout in Product Object:

The screenshot shows the Salesforce Page Layout editor for the 'Product' object. It has a toolbar with 'Save', 'Quick Save', 'Preview As...', 'Cancel', 'Undo', 'Redo', and 'Layout Properties'. On the left, there's a sidebar with 'Fields' and various options like Buttons, Quick Actions, etc. A red box highlights the 'Blank Space' section under 'Fields'. The main area shows the page layout with sections for 'Information' and 'System Information'. The 'Information' section is highlighted with a red box and contains fields for Product ID, Product Name, and Product Description, along with their respective values. The 'System Information' section contains fields for Created By, Last Modified By, and Owner.

Milestone 7 - Compact Layouts:

Activity 1: To create a Compact Layout to a Product Object

Skill Tags:

1. Go to setup >> click on Object Manager >> type object name(Product) in quick find box >> click on the Product object
2. Click on Compact Layouts in the sidebar .
3. Click on New.
4. Enter the Label as “Product Compact Layout”.
5. Select the Compact Layout Fields : Select Product name, Unit Price, Current Stock Level.
6. Click Save.

7. Click Compact Layout Assignment.
8. Click Edit Assignment.
9. Choose "Product Compact Layout" from the dropdown.
10. Click Save.

SETUP > OBJECT MANAGER
Product

Compact Layouts				
1 items, Sorted by Label				
LABEL	API NAME	PRIMARY	MODIFIED BY	LAST MODIFIED
System Default	SYSTEM	✓	SYSTEM	3 days ago

Quick Find New Compact Layout Assignment

- Details
- Fields & Relationships
- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts** 2
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Search Layouts

Milestone 9 – Profiles:

Activity 1: To create an Inventory Manager Profile:

Skill Tags:

1. Go to setup >> type profiles in quick find box >> click on profiles >> clone the desired profile (Standard User) >> enter profile name (Inventory Manager) >> Save.

2.

The screenshot shows the Salesforce Setup interface under the Profiles section. The 'Profiles' list includes:

Action	Profile Name	User License	Custom
<input type="checkbox"/>	Salesforce API Only System Integrations	Salesforce Integration	<input type="checkbox"/>
<input type="checkbox"/>	Silver Partner User	Silver Partner	<input type="checkbox"/>
<input type="checkbox"/>	Solution Manager	Salesforce	<input type="checkbox"/>
<input type="checkbox"/>	Standard Platform User	Salesforce Platform	<input type="checkbox"/>
<input type="checkbox"/>	Standard User	Salesforce	<input type="checkbox"/>
<input type="checkbox"/>	System Administrator	Salesforce	<input type="checkbox"/>

Milestone 10

Activity 1 : Create a Purchasing Manager Role.

Duration: 0.05 Hrs

Skill Tags:

1. Go to quick find >> Search for Roles >> click on Set Up Roles.

The screenshot shows the Salesforce Setup interface under the Roles section. The 'Understanding Roles' section displays a sample role hierarchy:

```
graph TD; CEO[CEO - President, CFO, VP Sales] --> WSD[Western Sales Director]; CEO --> ESD[Eastern Sales Director]; WSD --> WSRep1[Western Sales Rep]; WSD --> WSRep2[Eastern Sales Rep]; ESD --> ESRep1[Eastern Sales Rep]; ESD --> ESRep2[International Sales Rep];
```

Descriptions for each role level:

- Executive Staff:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other Executive Staff.
- Western Sales Director:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other Western Sales Directors.
- Eastern Sales Director:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other Eastern Sales Directors.
- International Sales Director:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other International Sales Directors.
- Western Sales Rep:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other Western Sales Reps.
- Eastern Sales Rep:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other Eastern Sales Reps.
- International Sales Rep:** View & edit data, roll up for all accounts, & generate reports for all accounts.
* Can't access data of other International Sales Reps.

Set Up Roles

Click on Expand All and click on add role under SVP, Sales & Marketing role.

Give Label as “Purchasing Manager” and Role name gets auto populated. Then click on Save.

3.

The screenshot shows the 'Roles' setup page. A new role is being created with the following details:

- Label:** Purchasing Manager
- Role Name:** Purchasing_Manager
- This role reports to:** SVP, Sales & Marketing

The 'Role Name' field and its associated help icon are highlighted with a red box. The 'Save' button at the bottom right is also highlighted with a red box.

Milestone 12 - Permission Sets:

The screenshot shows the 'Roles' setup page. A new role is being created with the following details:

- Label:** Inventory Manager
- Role Name:** Inventory_Manager
- This role reports to:** SVP, Sales & Marketing

The 'Role Name' field and its associated help icon are highlighted with a red box. The 'Save' button at the bottom right is also highlighted with a red box.

Milestone 14 - Triggers

Activity 1 : Create a Trigger to Calculate total amount on Order Item.

Skill Tags:

Step 1 : Login to Salesforce:

Log in to your Salesforce account with administrative privileges.

Step 2:

i)Navigate to Setup: Once logged in, click on the gear icon ?? (Setup) located at the top-right corner of the page. This will open the Setup menu.

ii)Click on Developer Console: Click on the "Developer Console" option from the Setup menu. This will open the Developer Console in a new browser tab or window.

Step 3:

i) In the Developer Console window, go to the top menu and click on "File". ii)Select New: From the dropdown menu under "File", select "New". iii)Choose Apex Trigger: This will open a new Apex Trigger editor tab. Create an Apex Trigger:

```
Trigger CalculateTotalAmountTrigger on Order_Item__c (after insert,  
after update, after delete, after undelete) {    // Call the handler class to  
handle the logic
```

```
    CalculateTotalAmountHandler.calculateTotal(Trigger.new,  
Trigger.old,      Trigger.isInsert, Trigger.isUpdate,  
      Trigger.isDelete, Trigger.isUndelete);  
}
```

Step 4:

i) In the Developer Console window, go to the top menu and click on "File".

ii)Select New: From the dropdown menu under "File", select "New".

iii)Choose Apex Class: Name it as CalculateTotalAmountHandler

```

public class CalculateTotalAmountHandler {

    // Method to calculate the total amount for Purchase Orders based on
    related Order Items public static void
    calculateTotal(List<Order_Item__c> newItems, List<Order_Item__c>
    oldItems, Boolean isInsert, Boolean isUpdate,
    Boolean isDelete, Boolean isUndelete) {

        // Collect Purchase Order IDs affected by changes in
        Order_Item__c records
        Set<Id> parentIds = new Set<Id>();

        // For insert, update, and undelete scenarios
        if (isInsert || isUpdate || isUndelete) {
            for
            (Order_Item__c ordItem : newItems) {
                parentIds.add(ordItem.Purchase_Order_Id__c);
            }
        }

        // For update and delete scenarios
        if (isUpdate || isDelete) {
            for
            (Order_Item__c ordItem : oldItems) {
                parentIds.add(ordItem.Purchase_Order_Id__c);
            }
        }

        // Calculate the total amounts for affected Purchase Orders
        Map<Id, Decimal> purchaseToUpdateMap = new Map<Id,
        Decimal>();

        if (!parentIds.isEmpty()) {
            // Perform an aggregate query to sum the Amount__c for each
            Purchase Order
            List<AggregateResult> aggrList = [
                SELECT Purchase_Order_Id__c, SUM(Amount__c)
            totalAmount
                FROM Order_Item__c

```

Milestone 15 – Reports:

Activity 1: Create a Purchase Orders based on Suppliers(Summary) Report

Skill Tags:

1. Click App Launcher
2. Select Medical Inventory Management App
3. Click on Reports tab
4. Click on New Report.
5. Click the report type as Purchase Orders Click Start report.

Create Report

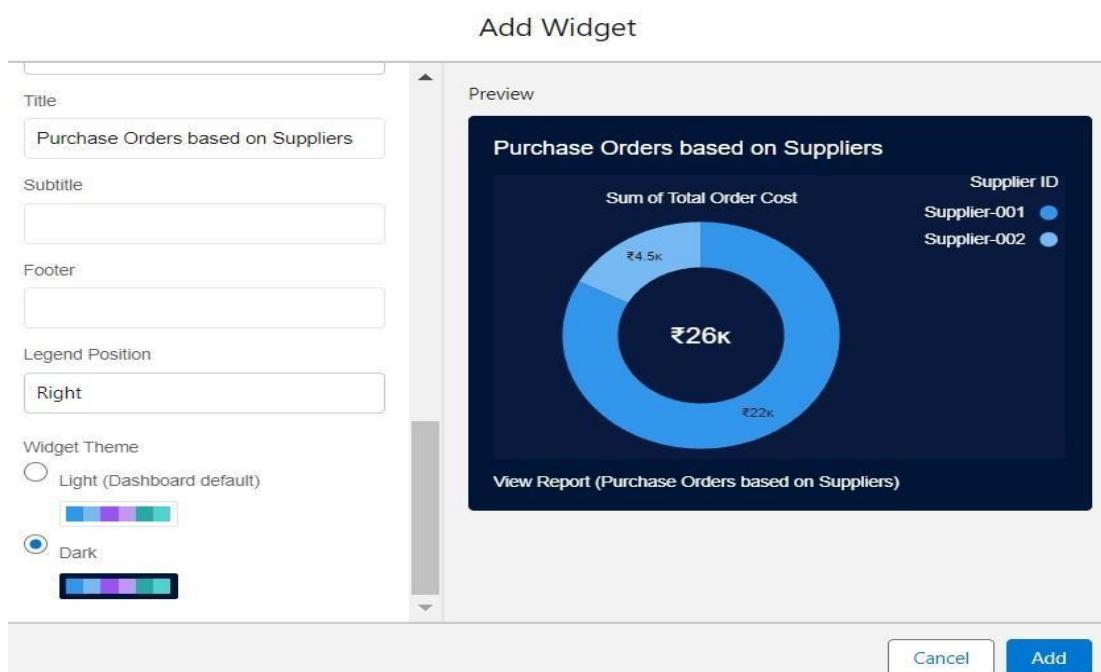
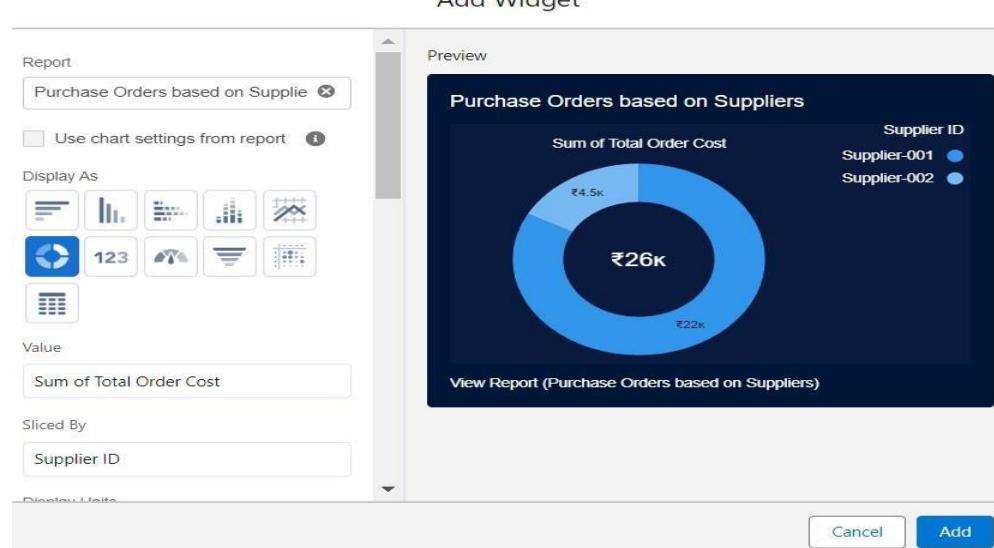
Report Type Name	Category
Purchase Orders	Standard
Purchase Orders with Supplier ID	Standard
Purchase Orders with Order Items	Standard
Purchase Orders with Order Items and Product ID	Standard
Inventory Transactions with Purchase Order ID	Standard

Milestone 16 – Dashboards:

Activity 1: - Create Dashboard

Skill Tags:

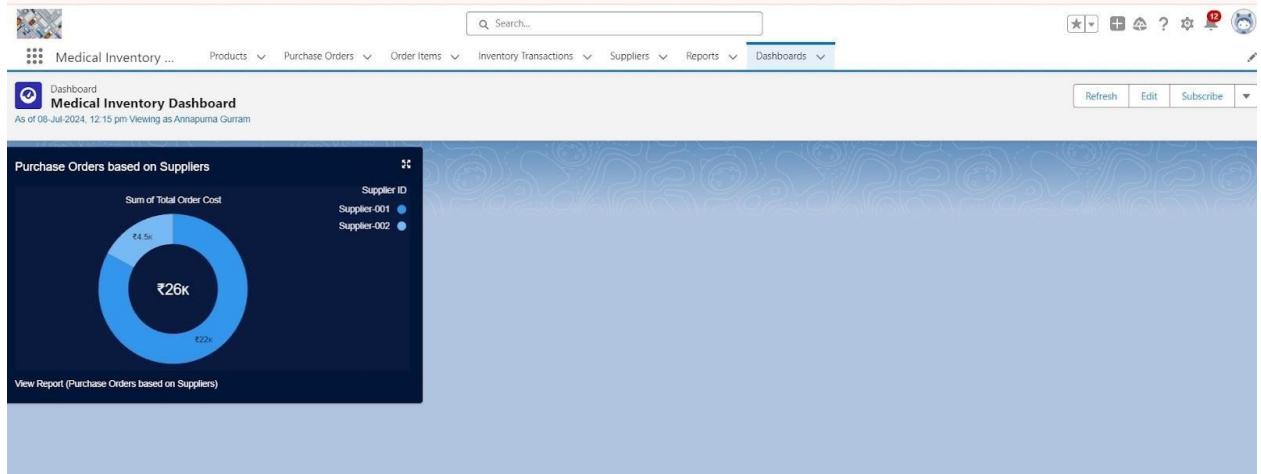
1. Click on the Dashboards tab from the Medical Inventory Management application.
2. Click on the new dashboard.
3. Give name - Medical Inventory DashBoard
4. Click create
5. Click on +widget
6. Select the Purchase Orders based on Suppliers Report
7. For the data visualization select any of the charts, tables etc. as per your choice/requirement
8. Click add.



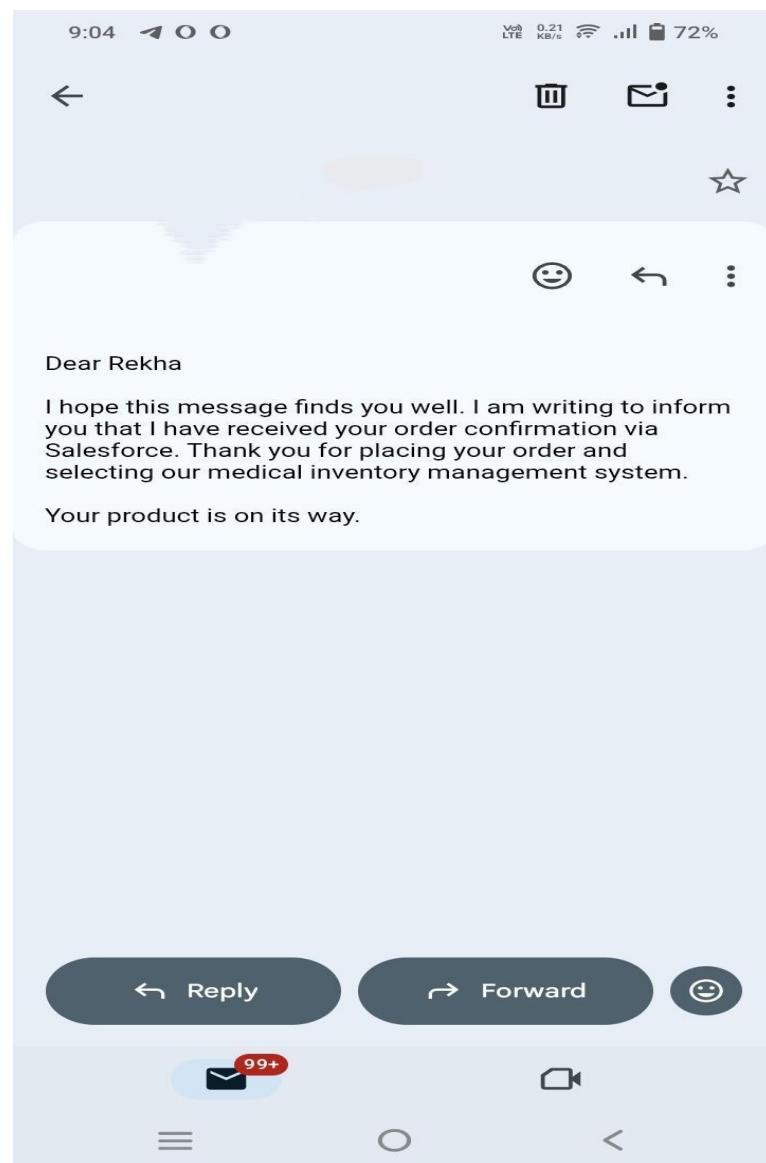
Activity 2: View Dashboard:

Skill Tags:

1. Click on App Launcher on the left side of the screen.
2. Search Medical Inventory Management & click on it.
3. Click on Dashboard Tab.
4. Click on Medical Inventory DashBoard see graph view of records



You will find notification like this and you will get an email check..



User Experience Considerations

- **Intuitive Navigation:** Simple tabs and clear icons for ease of access.
- **Responsive Layouts:** Optimized for both desktop and mobile Salesforce apps.
- **Role-Specific Interfaces:** Admins manage configurations; pharmacists handle daily stock operations.
- **Dashboards:** Offer color-coded insights for quick decisionmaking.

Project Development

Code Quality

All Apex classes follow Salesforce **best practices**:

- Modular and reusable methods.
- Bulkified triggers for handling multiple records.
- Proper exception handling and logging mechanisms.
- Descriptive comments for readability.

Apex Trigger and Handler

Trigger: CalculateTotalAmountTrigger

HandlerClass: CalculateTotalAmountHandler

Functionality:

Automatically calculates and updates the total amount in a Purchase Order when related Order Items are inserted, updated, or deleted.

Example Logic Flow:

1. Trigger detects changes in Order Items.
2. Handler retrieves related Purchase Orders.
3. Handler recalculates total amounts.
4. Updated totals are saved automatically.

Adherence to Timelines:

Project phases were completed systematically:

Phase	Activity	Duration	Status
1	Requirement Gathering	1 Week	Completed
2	Object and Field Setup	2 Weeks	Completed
3	Automation and Triggers	2 Weeks	Completed
4	UI Design and Dashboards	1 Week	Completed
5	Testing and Deployment	1 Week	Completed

Testing and Debugging:

Comprehensive testing validated all functionalities:

- Flows and validation rules worked correctly.
- Email alerts were functional (with minor spam filter issues).
- Data integrity and performance were verified.
- Security configurations (roles, profiles, permission sets) were properly enforced.

Use of Best Practices:

- Adopted **Trigger-Handler Design Pattern** in Apex.
- Implemented **Flows and Validation Rules** for process automation.
- Applied **Role-Based Security** for controlled access.
- Designed **Dynamic Dashboards** for visual analytics.
- Followed **Lightning UI Standards** for a modern look and feel.
- Ensured **Scalability** for future features and integrations.

Conclusion:

The **Medical Inventory Management System** effectively showcases how Salesforce CRM can be leveraged to automate healthcare inventory operations.

Key achievements include:

- Automated medicine tracking and expiry monitoring.
- Supplier and purchase order management.
- Real-time stock visibility and analytics.
- Reduced manual workload and data errors.

By combining Salesforce automation tools with robust data design, this system ensures **efficiency, accuracy, and transparency** in medical inventory workflows.

Future Enhancements:

- **Mobile App Integration:** For on-the-go stock management.
- **ERP Integration:** To connect with accounting and billing systems.
- **AI-Based Forecasting:** Predict medicine demand and optimize purchases.

References :

- <https://developer.salesforce.com/signup>
- <https://trailhead.salesforce.com>
- <https://help.salesforce.com>
- <https://www.salesforceben.com>
- <https://admin.salesforce.com>

