

MEDICAL INVENTORY MANAGEMENT

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TEAM ID : LTVIP2025TMID30494

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FINAL DOCUMENTATION

| | |
|--------------|------------------------------|
| Date | 28 June 2025 |
| Team ID | LTVIP2025TMID30494 |
| Project Name | Medical Inventory Management |

1. INTRODUCTION

1.1 Project Overview

The **Medical Inventory Management** system is a Salesforce-based application designed to simplify inventory operations in healthcare. It streamlines medicine tracking, supplier coordination, and purchase order management with automation features such as Flows, Scheduled Jobs, and Apex triggers.

Key Modules:

- Stock Monitoring
- Purchase Order Lifecycle
- Automation
- Supplier Performance Management
- Real-time Reporting & Dashboards

1.2 Purpose

The main objective is to eliminate manual inventory tracking errors and enable timely procurement, expiry management, and process transparency—ensuring safe and efficient hospital operations.

2. IDEATION PHASE

2.1 Problem Statement

Manual inventory tracking leads to expired stock use, supply delays, and limited visibility into stock levels—posing risks to patient safety and operational efficiency.

2.2 Empathy Map

- **Think & Feel:** “What if the stock expires before use?”
- **Hear:** “Supplies are delayed again.”
- **See:** Irregular delivery timelines, outdated stock entries
- **Say & Do:** Uses Excel sheets, manually checks inventory

- **Pain:** Unreliable alerts, high error risk
- **Gain:** Automated stock alerts, supplier history tracking

2.3 Brainstorming

Ideas included:

- PO auto-calculation using Apex
- Inventory dashboards
- Custom supplier scorecards

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

From stock shortage detection to PO approval and product delivery, Inventory and Purchase Managers interact with dashboards, flows, and data-driven insights throughout the process.

3.2 Solution Requirements

- **Salesforce Platform**
 - **Custom Objects:** Product, Supplier, Purchase Order, Order Item, Inventory Transaction
 - **Automation:** Flows, Apex, Validation Rules
 - **Reports:** Supplier Summary, Expiry Forecast, PO History
 - **Access Control:** Profiles, Permission Sets

3.3 Data Flow Diagram

- **Inventory Manager:** Updates stock, monitors expiry
- **Purchase Manager:** Generates PO → Flow triggers approval → Order delivered → Inventory updated

3.4 Technology Stack

- **Platform:** Salesforce
- **Logic Layer:** Apex, SOQL, Flows
- **Data Layer:** Custom Objects
- **Visualization:** Reports & Dashboards

4. PROJECT DESIGN

4.1 Problem–Solution Fit

Automating the inventory and procurement cycle addresses expiry risks, approval delays, and inconsistent data tracking.

4.2 Proposed Solution

A low-code Salesforce application using Apex, Flows, and dashboards to manage inventory lifecycle, with alerts, approval logic, and real-time tracking.

4.3 Solution Architecture

- **Frontend:** Lightning Experience UI
- **Backend:** Custom Objects & Triggers
- **Automation:** Scheduled Flows, Approval Processes
- **Security:** Role-based access
- **Reporting:** Dashboards + Custom Report Types

5. PROJECT PLANNING & SCHEDULING

- **Week 1:** Object & Field Setup
- **Week 2:** Flow & Validation Rule Implementation
- **Week 3:** Apex Trigger Creation & Testing
- **Week 4:** Report Building & Dashboard Design
- **Week 5:** Final Testing & Documentation

Objects:

The screenshot shows the Salesforce Object Manager interface. The top navigation bar includes 'Setup', 'Home', 'Object Manager', and a search bar. The main area displays the 'Product' object details. On the left, a sidebar lists various object settings: Fields & Relationships, Page Layouts, Lightning Record Pages, Buttons, Links, and Actions, Compact Layouts, Field Sets, Object Limits, Record Types, Related Lookup Filters, Search Layouts, List View Button Layout, Restriction Rules, Scoping Rules, Object Access, and Triggers. The main content area shows the 'Details' tab for the Product object. It includes fields for Description, API Name (Product__c), Singular Label (Product), Plural Label (Products), and several checkboxes for Enable Reports, Track Activities, and Track Field History. Deployment status is listed as Deployed. A link to Standard salesforce.com Help Window is also present. At the bottom right are 'Edit' and 'Delete' buttons.

SETUP > OBJECT MANAGER
Purchase Order

Details

Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Search Layouts
List View Button Layout
Restriction Rules
Scoping Rules
Object Access
Triggers

Details

Description
API Name: Purchase_Order_c
Custom: ✓
Singular Label: Purchase Order
Plural Label: Purchase Orders

Enable Reports: ✓
Track Activities
Track Field History
Deployment Status: Deployed
Help Settings
Standard salesforce.com Help Window

Edit Delete

SETUP > OBJECT MANAGER
Order Item

Details

Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Search Layouts
List View Button Layout
Restriction Rules
Scoping Rules
Object Access
Triggers

Details

Description
API Name: Order_Item_c
Custom: ✓
Singular Label: Order Item
Plural Label: Order Items

Enable Reports: ✓
Track Activities
Track Field History
Deployment Status: Deployed
Help Settings
Standard salesforce.com Help Window

Edit Delete

SETUP > OBJECT MANAGER
Inventory Transaction

Details

Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Search Layouts
List View Button Layout
Restriction Rules
Scoping Rules
Object Access
Triggers

Details

Description
API Name: Inventory_Transaction_c
Custom: ✓
Singular Label: Inventory Transaction
Plural Label: Inventory Transactions

Enable Reports: ✓
Track Activities
Track Field History
Deployment Status: Deployed
Help Settings
Standard salesforce.com Help Window

Edit Delete

SETUP > OBJECT MANAGER
Supplier

Details

Description

API Name
Supplier__c

Custom
✓
Singular Label
Supplier
Plural Label
Suppliers

Enable Reports
✓
Track Activities

Track Field History

Deployment Status
Deployed
Help Settings
Standard salesforce.com Help Window

Edit **Delete**

Fields & Relationships

- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Search Layouts
- List View Button Layout
- Restriction Rules
- Scoping Rules
- Object Access
- Triggers

Fields:

SETUP > OBJECT MANAGER
Product

Fields & Relationships
10 Items, Sorted by Field Label

| FIELD LABEL | FIELD NAME | DATA TYPE | CONTROLLING FIELD | INDEXED |
|---------------------|------------------------|--------------------|-------------------|---------|
| Created By | CreatedBy | Lookup(User) | | |
| Current Stock Level | Current_Stock_Level__c | Number(18, 0) | | |
| Expiry Date | Expiry_Date__c | Date | | |
| Last Modified By | LastModifiedBy | Lookup(User) | | |
| Minimum Stock Level | Minimum_Stock_Level__c | Number(18, 0) | | |
| Owner | OwnerId | Lookup(User,Group) | ✓ | |
| Product Description | Product_Description__c | Text Area(255) | | |
| Product Id | Name | Text(80) | ✓ | |
| Product Name | Product_Name__c | Text(25) | | |
| Unit Price | Unit_Price__c | Currency(16, 2) | | |

SETUP > OBJECT MANAGER
Purchase Order

Details

Description

API Name
Purchase_Order__c

Custom
✓
Singular Label
Purchase Order
Plural Label
Purchase Orders

Enable Reports
✓
Track Activities

Track Field History

Deployment Status
Deployed
Help Settings
Standard salesforce.com Help Window

Edit **Delete**

Fields & Relationships

- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Search Layouts
- List View Button Layout
- Restriction Rules
- Scoping Rules
- Object Access
- Triggers

Purchase Order

| Fields & Relationships | | | | |
|------------------------|---------------------------|------------------------------------|-------------------|---------|
| FIELD LABEL | FIELD NAME | DATA TYPE | CONTROLLING FIELD | INDEXED |
| Actual Delivery Date | Actual_Delivery_Date__c | Date | | |
| Created By | CreatedById | Lookup(User) | | |
| Expected Delivery Date | Expected_Delivery_Date__c | Date | | |
| Last Modified By | LastModifiedById | Lookup(User) | | |
| Order Count | Order_Count__c | Roll-Up Summary (COUNT Order Item) | | |
| Order Date | Order_Date__c | Date | | |
| Owner | OwnerId | Lookup(User/Group) | ✓ | |
| Purchase Order Id | Name | Text(80) | ✓ | |
| Supplier ID | Supplier_ID__c | Lookup(Supplier) | ✓ | |
| Total Order Cost | Total_Order_Cost__c | Currency(16, 2) | | |

Order Item

| Fields & Relationships | | | | |
|------------------------|----------------------|-------------------------------|-------------------|---------|
| FIELD LABEL | FIELD NAME | DATA TYPE | CONTROLLING FIELD | INDEXED |
| Amount | Amount__c | Formula (Currency) | | |
| Created By | CreatedById | Lookup(User) | | |
| Last Modified By | LastModifiedById | Lookup(User) | | |
| Order Item Id | Name | Text(80) | ✓ | |
| Product ID | Product_ID__c | Lookup(Product) | ✓ | |
| Purchase Order ID | Purchase_Order_ID__c | Master-Detail(Purchase Order) | ✓ | |
| Quantity Ordered | Quantity_Ordered__c | Number(18, 0) | | |
| Quantity Received | Quantity_Received__c | Number(18, 0) | | |
| Unit Price | Unit_Price__c | Formula (Currency) | | |

Inventory Transaction

| Fields & Relationships | | | | |
|------------------------|----------------------|------------------------|-------------------|---------|
| FIELD LABEL | FIELD NAME | DATA TYPE | CONTROLLING FIELD | INDEXED |
| Created By | CreatedById | Lookup(User) | | |
| Last Modified By | LastModifiedById | Lookup(User) | | |
| Owner | OwnerId | Lookup(User/Group) | ✓ | |
| Purchase Order ID | Purchase_Order_ID__c | Lookup(Purchase Order) | ✓ | |
| Total Order Cost | Total_Order_Cost__c | Formula (Currency) | | |
| Transaction Date | Transaction_Date__c | Date | | |
| Transaction Id | Name | Text(80) | ✓ | |
| Transaction Type | Transaction_Type__c | Picklist | | |

Validation and Flows :

Purchase Order Validation Rule

Validation Rule Detail

- Rule Name: Expected_Delivery_Date_Validation
- Error Condition Formula: (Expected_Delivery_Date__c - Order_Date__c) > 7
- Error Message: The Expected Delivery Date should not exceed 7 days
- Description: Expected Delivery Date Validation
- Created By: Balaji Gudur (6/23/2025, 3:29 AM)
- Modified By: Balaji Gudur (6/23/2025, 3:29 AM)

Actual Delivery Date Updating

Flow Detail

| | | |
|---|--|---|
| Flow Label: Actual Delivery Date Updating | Description: Actual Delivery Date Updating | Flow API Name: Actual_Delivery_Date_Updating |
| Environment: Default | Active Version: 1 | Namespace Prefix: |
| Triggers: Record--Run Before Save | Modified By: Balaji Gudur (6/23/2025, 4:00 AM) | Type: Auto-launched Flow |
| | | URL: /flow/Actual_Delivery_Date Updating |
| | | Activated/Deactivated by: Balaji Gudur (6/23/2025, 4:00 AM) |
| | | Created By: Balaji Gudur (6/23/2025, 3:29 AM) |

Flow Versions

| Action | Flow Label | Version | Description | Built with | Created Date | Type | Status | Progress Status | Run in Mode | API Version for Running the Flow | Log Metrics to Data Cloud |
|-------------------------|-------------------------------|---------|-------------------------------|--------------|--------------------|--------------------|--------|-----------------|--------------|----------------------------------|---------------------------|
| Open Run Deactivate | Actual Delivery Date Updating | 1 | Actual Delivery Date Updating | Flow Builder | 6/23/2025, 5:09 AM | Auto-launched Flow | Active | Activated | Default Mode | 64.0 | |

Apex Code :

```
File ▾ Edit ▾ Debug ▾ Test ▾ Workspace ▾ Help ▾ < >
CalculateTotalAmountTrigger.aprx CalculateTotalAmountHandler.apxc
Code Coverage: None ▾ API Version: 64 ▾ Go To
trigger CalculateTotalAmountTrigger on Order_Item__c (after insert, after update, after delete, after undelete) {
    CalculateTotalAmountHandler.calculateTotal(Trigger.new, Trigger.old, Trigger.isInsert, Trigger.isUpdate, Trigger.isDelete, Trigger.isUndelete);
}
```

File • Edit • Debug • Test • Workspace • Help • < >

CalculateTotalAmountTrigger.apxc CalculateTotalAmountHandler.apxc

Code Coverage: None • API Version: 64 Go To

```

1 public class CalculateTotalAmountHandler {
2     public static void calculateTotal(List<Order_Item__c> newItems, List<Order_Item__c> oldItems, Boolean isInsert, Boolean isUpdate, Boolean isDelete, Boolean isUndelete) {
3         Set<Id> parentIds = new Set<Id>();
4         if (isInsert || isUpdate || isUndelete) {
5             for (Order_Item__c ordItem : newItems) {
6                 parentIds.add(ordItem.Purchase_Order__Id__c);
7             }
8         }
9         if (isUpdate || isDelete) {
10            for (Order_Item__c ordItem : oldItems) {
11                parentIds.add(ordItem.Purchase_Order__Id__c);
12            }
13        }
14     Map<Id, Decimal> purchaseToUpdateMap = new Map<Id, Decimal>();
15     if (!parentIds.isEmpty()) {
16         List<AggregateResult> aggrList = [
17             SELECT Purchase_Order__Id__c, SUM(Amount__c) totalAmount
18             FROM Order_Item__c
19             WHERE Purchase_Order__Id__c IN :parentIds
20             GROUP BY Purchase_Order__Id__c
21         ];
22         for (AggregateResult aggr : aggrList) {
23             Id purchaseOrderId = (Id)aggr.get('Purchase_Order__Id__c');
24             Decimal totalAmount = (Decimal)aggr.get('totalAmount');
25             purchaseToUpdateMap.put(purchaseOrderId, totalAmount);
26         }
27     List<Purchase_Order__c> purchaseToUpdate = new List<Purchase_Order__c>();
28     for (Id purchaseOrderId : purchaseToUpdateMap.keySet()) {
29         Purchase_Order__c purchaseOrder = new Purchase_Order__c(Id = purchaseOrderId, Total_Order_Cost__c = purchaseToUpdateMap.get(purchaseOrderId));
30         purchaseToUpdate.add(purchaseOrder);
31     }
32     if (!purchaseToUpdate.isEmpty()) {
33         update purchaseToUpdate;
34     }
35   }
36 }
37 }
```

Dashboards

Medical Inventory ... Products Purchase Orders Order Items Inventory Transactions Suppliers Reports Dashboards

Search... ★ + ? ⚡ 🔍

Medical Inventory Dashboard
Medical Inventory DashBoard
As of Jun 28, 2025, 10:41 PM Viewing as Balaji Gudur

Refresh Edit Subscribe

Purchase Orders based on Suppliers

| Supplier ID | Sum of Total Order Cost |
|-------------|-------------------------|
| SUP001 | \$168.8 |
| SUP002 | \$135 |
| SUP003 | \$100 |
| SUP004 | \$90 |
| SUP005 | \$40 |
| SUP006 | \$300 |

[View Report \(Purchase Orders based on Suppliers\)](#) As of Jun 28, 2025, 10:41 PM

Complete Purchase Details Report

| Purchase Order | Sum of Amount |
|----------------|---------------|
| PO011 | \$168.8 |
| PO012 | \$135 |
| PO013 | \$100 |
| PO014 | \$90 |
| PO015 | \$40 |
| PO016 | \$300 |

[View Report \(Complete Purchase Details Report\)](#) As of Jun 28, 2025, 10:41 PM

Functional Testing

New Purchase Order

* = Required Information

Information

| | | |
|-------------------------------------|--|--|
| * Purchase Order Id PO021 | Actual Delivery Date 7/10/2025 | |
| * Supplier ID SUP002 | Total Order Cost \$100.00 | |
| * Order Date 6/28/2025 | Owner Balaji Gudur | |
| Expected Delivery Date 7/12/2025 | ∅ We hit a snag. Review the errors on this page. <ul style="list-style-type: none"> The Expected Delivery Date should not exceed 7 days | |

∅ Cancel Save & New Save

Flow Builder Actual Delivery Date Updating - V2 Debug Run: Actual Delivery Date Updating 6/29/2025, 10:20 AM Completed

Edit Flow Convert to Test Debug Again Save As New Version Save Activate

Record-Triggered Flow Start

```

graph TD
    Start((Record-Triggered Flow Start)) --> GetPurchaseRecord[Get Purchase Record]
    GetPurchaseRecord --> Assignment[Assignment]
    Assignment --> UpdateOrder[Updating Purchasing Order]
    UpdateOrder --> End((End))
  
```

Debug Details

Expand All Basic Debug Log

Search this list...

Get Records: GET PURCHASE RECORD

We couldn't retrieve any records.

Assignment: Assignment

2 variables were updated.

Update Records: Updating Purchasing Order

One or more Purchase_Order_c records are ready to be updated.

Rollback

How the Interview Finished

The flow interview ran for 1.07 seconds and finished on June 29, 2025 at 10:20 AM.

6. DEVELOPMENT HIGHLIGHTS

- Built objects with fields: Product (Expiry, Quantity), PO (Expected Delivery, Total Amount), Supplier
- Triggers for PO total calculation
- Validation Rules for delivery constraints
- Record Pages and Tabs for each object
- Dashboards for Stock Overview and Supplier Analysis
- Deployed Permission Sets for role separation

7. TESTING

- Functional testing for record saves, and trigger outputs
- Validation rule triggers (e.g., invalid dates)
- Dashboard visuals checked against data changes
- Flow testing for correct alerting and field auto-updates

8. RESULTS

- Real-time visibility into stock health
- Automated expiry and delivery tracking
- Improved procurement planning and supplier accountability
- Reduced manual errors and data duplication

9. ADVANTAGES & DISADVANTAGES

Advantages:

- Real-time expiry and inventory alerts
- Automated PO lifecycle
- Enhanced staff coordination
- Scalable to multi-unit hospitals

Disadvantages:

- Requires internet access
- Learning curve for non-technical users
- Setup time if expanded to include integrations

10. CONCLUSION

The Medical Inventory Management app improves patient safety, operational reliability, and procurement accuracy by combining intuitive Salesforce design with healthcare-specific workflows.

11. FUTURE SCOPE

The Medical Inventory Management system is built for scalability and forward compatibility. Future enhancements may include:

1. Integration with Barcode Scanners

Allow faster stock updates and receipt confirmations using barcode-enabled devices or mobile apps.

2. AI-Driven Stock Forecasting

Use predictive analytics to forecast medicine usage trends and automate reordering before shortages occur.

3. Mobile App Access

Provide doctors and staff with quick access to inventory data from mobile devices on hospital floors or remote sites.

4. Multi-Branch Inventory Sync

Support centralized or distributed tracking across multiple hospital departments, buildings, or locations.

5. IoT Integration for Storage Monitoring

Integrate with temperature and humidity sensors to track conditions for sensitive medicine stock.

6. Digital Signature Workflow

Approve Purchase Orders and contracts using digital signing tools (e.g. Adobe Sign, DocuSign).

7. Integration with Government Procurement Portals

Link your PO process with e-marketplaces for seamless vendor approvals and policy compliance.

8. Advanced Role-Based Analytics

Provide role-specific dashboards (e.g. pharmacist vs procurement head) to personalize insights and simplify actions.

Demo Video link :

<https://drive.google.com/file/d/1wl9Q7XZ6qg6vgHKphBI-30DLMTqUTfAh/view?usp=sharing>