

PHASE IV: PROJECT DESIGN

Field	Details
Date	05 November 2025
Team ID	NM2025TMID07730
Project Name	Medical Inventory Management System
Maximum Marks	4 Marks

Title: Project Design Phase for “ “Medical Inventory Management System”

1. Objective

The objective of the Design Phase is to translate the defined requirements into a complete system architecture for the Medical Inventory Management System.

This phase focuses on creating the user interface (UI), process automation logic, security configuration, and analytical dashboards to streamline the management of medical supplies, purchase orders, and stock movements.

Key design focus areas:

- User Interface (Items, Suppliers, Purchase Orders, GRNs, Stock Pages)
- Process Automation (Flows, Approvals, Triggers)
- Security & Role-Based Access
- Real-Time Reporting & Inventory Dashboards

2. Design Overview

The Medical Inventory Management System is designed using Salesforce Lightning Experience, providing an intuitive, cloud-based, and automated inventory solution.

The system design includes:

- Five core objects — Item, Supplier, Purchase Order, Goods Receipt (GRN), Stock Ledger
- Screen Flows for PO creation and GRN entry
- Apex Trigger for auto stock balance update
- Reports & Dashboards for stock status, expiry, and supplier performance
- Role-based data visibility for clerks, managers, and finance users

3. User Interface (UI) Design

3.1 Lightning App Design

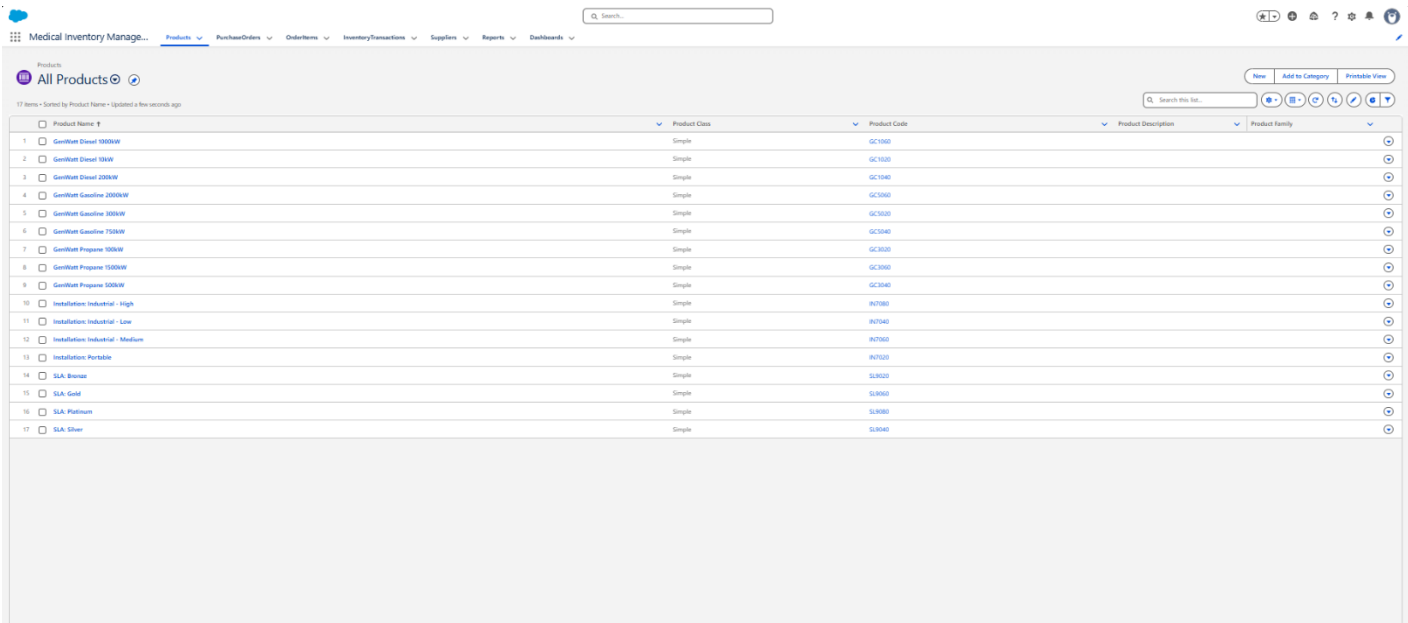
A custom Lightning App named “Medical Inventory Management” was created for store and purchase users.

Steps followed:

1. Setup → App Manager → New Lightning App
2. Added logo, app description, and branding color
3. Navigation tabs included:

- Home
- Items
- Suppliers
- Purchase Orders
- Goods Receipts (GRN)
- Stock Ledger
- Issues / Returns
- Reports & Dashboards

Design Principles Applied:



Principle	Purpose
Role-Based UI	Clerks see only assigned stores; Managers view all stock
Clean Layout	Streamlined tabs and record pages for faster navigation
Guided Navigation	Quick actions and flows for PO and GRN creation

3.2 Home Page Design

Component	Purpose
Quick Action Flow	“Create Purchase Order” – one-click procurement initiation
Dashboard View	Displays stock level summary, low-stock alerts, and expiry data
Announcement Panel	Shows purchase approvals, vendor updates, and maintenance alerts

4. Automation Design

Automation minimizes manual intervention for stock updates, reorder alerts, and validation checks.

4.1 Screen Flow – Lease Creation Flow

Flow Steps:

1. Select **Purchase Order**
2. Display linked items with ordered quantity
3. Enter received quantity, batch number, and expiry date
4. Auto-update **Stock Ledger** and PO status to “Received”
5. Show success confirmation — “Goods Received Successfully”

Outcome:

- Eliminates manual stock entry
- Ensures accurate GRN tracking and stock updates

4.2 Apex Trigger – Auto Stock Update

Trigger on: GRN Line Item Object:

```
IF (Status__c == 'Received') {  
    Item__r.Current_Stock__c += Quantity_Received__c;  
}
```

Trigger Event	Action
Before Insert / Update	Auto-update stock quantity at item level

Benefit:

Ensures real-time stock availability without manual adjustments.

5. Security Design

5.1 Profile-Based Access

Profile	Access Level
Store Clerk Profile	Create/Edit GRNs, Issues, Returns for assigned store
Inventory Manager Profile	Full CRUD on Items, Purchase Orders, GRNs
Finance Officer Profile	Read-only on stock, full access to purchase data
System Admin	Complete access and configuration control

5.2 Sharing Rules

Rule	Shared With	Purpose
Item.Stock_Status = "Low"	Inventory Manager	Automatically notifies managers to initiate the reorder process when stock levels drop below threshold.
GRN.Status = "Received"	Store Clerk & Finance	Enables both store clerks and finance users to update stock records and verify purchase completion.
Expiry_Date ≤ 30 Days	Store Clerks	Triggers alerts and restricts issue of near-expiry items to ensure patient safety and regulatory compliance.

Security Highlights:

- Ensures restricted access per user role
- Provides 360° visibility for management

6. Reporting and Dashboard Design

6.1 Reports Created

Report Type	Purpose
Item with Stock Ledger	Monitor real-time stock levels
Purchase Order with GRN	Track procurement efficiency
Near-Expiry Item Report	Proactive expiry control
Department Issue Summary	Analyze consumption trends

6.2 Dashboard Components

Component	Visual Type	Insight
Stock Overview	Donut Chart	Current stock by category
Expiry Summary	Bar Chart	Items expiring in next 30 days
Top Vendors	Line Chart	Vendor performance trends
Low-Stock Alerts	Table	Items below reorder level
Monthly PO Trends	Area Chart	Procurement cycle analysis

7. System Architecture Design

Layer	Component	Purpose
Presentation Layer	Lightning App UI	User interaction & operations
Logic Layer	Flows, Apex Triggers, Validation Rules	Automates core inventory processes

Data Layer	Custom Objects	Stores items, suppliers, and transactions
Analytics Layer	Reports & Dashboards	Provides insights & performance metrics

8. Design Constraints

Constraint	Impact	Solution
Large stock dataset	Slow dashboard refresh	Use summarized reports
Multiple alerts	User fatigue	Combine alerts into daily digest
Mobile layout scroll	Minor usability issue	Enable responsive page templates

9. Future Design Considerations

Enhancement	Benefit
Supplier performance analytics	Evaluate vendor efficiency
Barcode/QR integration	Speed up item receipt & issue
IoT-based auto-reorder sensors	Real-time inventory automation
AI-powered demand forecasting	Reduce overstock and wastage

10. Summary

The Project Design Phase establishes the structural, functional, and visual foundation of the Medical Inventory Management System.

Through Salesforce Lightning design, automated flows, secure access, and real-time dashboards, the system ensures:

- Fully automated stock and procurement lifecycle
- Simplified, user-friendly interface for non-technical staff
- Role-based security for compliance and control
- Comprehensive reporting for informed decision-making

This design enables a seamless transition to the Implementation & Testing Phase, ensuring that the solution is ready for deployment in a healthcare environment.