MEDICAL INVENTORY MANAGEMENT

Project Design Phase Report

TEAM ID	NM2025TMID07179
PROJECT NAME	MEDICAL INVENTORY MANAGEMENT
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1. Introduction

The **Project Design Phase** is the stage where the conceptual ideas and plans from the previous phases (Ideation and Planning) are translated into a detailed technical structure.
In this phase, the **system architecture, data model, process flows, user interface, and automation logic** are designed for implementation in Salesforce. The aim is to ensure that the Medical Inventory Management System (MIMS) is scalable, efficient, and aligned with healthcare requirements.

2. Objective of the Design Phase

The primary objectives of the design phase are:

- To design a **blueprint** for the entire Medical Inventory Management System.
- To define **data models**, **object relationships**, and **user interfaces** within Salesforce.
- To plan the **workflow automation**, **security**, and **integration architecture**.
- To ensure that all designs support the business logic and project goals established in earlier phases.

3. System Architecture Design

The system architecture defines how different components of the Salesforce application interact.

Key Layers:

- **Presentation Layer:** Lightning pages, apps, tabs, and record pages that users interact with.
- **Application Layer:** Apex classes, triggers, and flows that handle business logic and automation.
- **Database Layer:** Salesforce objects and fields storing all medical inventory data.

Core Components:

- **Custom Objects:**
  - *Medicine__c* – Stores medicine details like name, category, expiry date, quantity.
  - *Supplier__c* – Maintains supplier information and contact details.
  - *Purchase_Order__c* – Handles stock procurement and supplier orders.
  - *Inventory_Transaction__c* – Logs stock in/out operations.

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4. Data Model and Entity Relationship (ER) Design

The data model visually represents how different objects relate to each other:

- **Medicine__c** → related to **Purchase_Order__c** (Lookup or Master-Detail)
- **Purchase_Order__c** → linked to **Supplier__c**
- **Inventory_Transaction__c** → linked to **Medicine__c** and **Purchase_Order__c**

Relationships:

- One Supplier → Many Purchase Orders
- One Purchase Order → Many Medicines
- One Medicine → Many Inventory Transactions

This structure ensures data consistency and easy tracking of medical stock movements.

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5. Workflow and Process Design

Salesforce's automation tools are planned in this stage to simplify inventory operations.

Key Automation Features:

- **Record-Triggered Flows:** Auto-update stock quantity after purchase or consumption.
- **Approval Process:** For verifying new supplier or purchase order creation.
- **Apex Triggers:** Calculate total purchase cost or send expiry alerts.
- **Validation Rules:** Prevent incorrect data entry (e.g., negative stock or expired dates).

6. User Interface (UI) Design

User experience is enhanced through customized Salesforce Lightning Pages.

UI Components:

- **Home Page:** Dashboard displaying total medicines, low stock, and alerts.
- **Medicine Page:** Details about medicine name, batch number, expiry date, quantity.
- **Supplier Page:** Contact and transaction history of suppliers.
- **Reports & Dashboards:** Real-time visualization of inventory levels, purchase patterns, and alerts.

The design ensures a simple, user-friendly interface for admins, pharmacists, and managers.

7. Security and Access Design

Security planning ensures that sensitive medical and supplier data is protected.

Security Measures Include:

- **Role Hierarchies:** Admin, Pharmacist, Supplier Manager.
- **Profile Permissions:** Controlled access to create, edit, or delete records.
- **Field-Level Security:** Hides sensitive information such as pricing or supplier IDs.

8. Integration Design (if applicable)

If required, Salesforce can integrate with external healthcare ERP systems, supplier portals, or hospital databases through:

- **API Integrations (REST/SOAP)**
- **Salesforce Connect** for real-time data synchronization.

9. Output of Design Phase

Deliverables from this phase include:

- **System Architecture Diagram**
- **Entity Relationship Diagram (ERD)**
- **Workflow and Process Flow Diagrams**
- **UI Mockups** and **Dashboard Layouts**
- **Security and Permission Matrix**

10. Conclusion

The **Project Design Phase** acts as the technical foundation for system development. It transforms the conceptual framework into a **structured, visual, and functional blueprint** ready for implementation. Through Salesforce's advanced tools like custom objects, Lightning components, Flows, and Apex, the design ensures that the **Medical Inventory Management System** will be efficient, secure, and capable of handling real-world healthcare inventory challenges.