

Medical Inventory Management

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	1 NOV 25
Team ID	NM2025TMID04716
Project Name	Medical Inventory Management System

Technical Architecture

The **Medical Inventory Management System** is designed using a **Salesforce-based cloud architecture**, which provides automation, data security, scalability, and real-time processing. The architecture is developed to automate all key functions of medical inventory — including supplier management, product tracking, purchase order generation, and stock management.

This system integrates multiple Salesforce technologies to ensure that users can manage medical data efficiently while maintaining integrity and reliability. The application runs completely on a cloud platform, ensuring accessibility from any location without local infrastructure dependency.

The architecture includes the following core layers:

- **User Interface Layer** – Enables administrators and managers to interact through a responsive web dashboard.
- **Application Logic Layer** – Implements automation through validation rules, flows, and triggers to maintain real-time updates.
- **Database Layer** – Stores supplier, product, and purchase order data securely within Salesforce's cloud database.
- **Analytics Layer** – Provides dashboards and reports for real-time analysis of stock and supplier performance.
- **Integration Layer** – Supports possible API integration with hospital management systems or ERP platforms in future upgrades.

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Guidelines Followed

- Includes all major modules as separate logic components (Supplier, Product, Purchase Order, and Inventory).
- Hosted fully on Salesforce Cloud, eliminating the need for local server maintenance.
- Ensures high-level data protection through Salesforce security protocols and access controls.
- Utilizes automated workflows to improve system efficiency and accuracy.
- Supports extensibility for integration with third-party APIs such as barcode scanners or hospital data systems.

Components and Technologies

S.No	Component	Description	Technology Used
1	User Interface	Interface for users such as administrators, pharmacists, and purchase managers to interact with the system.	Salesforce Lightning Web UI
2	Application Logic – 1	Handles supplier and product data validation and ensures proper record creation.	Salesforce Flow Builder and Validation Rules
3	Application Logic – 2	Automates total cost calculation and purchase order updates using triggers.	Apex Triggers and Classes

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S.No	Component	Description	Technology Used
4	Application Logic – 3	Sends expiry alerts and low-stock notifications to users.	Salesforce Flow and Scheduled Trigger
5	Database	Stores details of suppliers, products, purchase orders, and stock transactions.	Salesforce Cloud Database
6	Cloud Database	Centralized cloud storage for data security and scalability.	Salesforce Data Cloud
7	File Storage	Stores related files such as invoices or supplier documents.	Salesforce Files / Attachments
8	External API (Optional)	Integration support for hospital ERP or pharmacy management systems.	REST API Integration
9	Machine Learning Model	Optional extension for predictive stock analytics.	Einstein Analytics (Future Integration)
10	Infrastructure (Server / Cloud)	Entire system hosted and managed on Salesforce Cloud.	Salesforce SaaS Platform

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Application Characteristics:

S.No	Characteristic	Description	Technology Used
1	Open-Source Frameworks	Not applicable as Salesforce is a proprietary cloud platform.	-
2	Security Implementations	Role-based access control and permission sets restrict unauthorized access. Salesforce Shield provides platform encryption, event monitoring, and transaction security to protect sensitive healthcare data.	Profiles, Roles, Permission Sets, Salesforce Shield
3	Scalable Architecture	Cloud-based design supports horizontal and vertical scaling to accommodate growth and demand.	Salesforce Cloud Architecture
4	Availability	Highly available with redundant Salesforce instances ensuring 99.9% uptime through load-balanced cloud infrastructure.	Load-Balanced Cloud Infrastructure

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S.No	Characteristic	Description	Technology Used
5	Performance	Optimized workflows, indexed queries, and Apex code optimization enhance system responsiveness.	Apex Code Optimization, Indexed Tables
6	Data Backup and Recovery	Automated backup and restore mechanisms using Salesforce's export and backup tools safeguard against data loss.	Salesforce Data Export and Backup
7	User Experience	Interactive, intuitive Lightning UI facilitates quick navigation and efficient user interaction.	Salesforce Lightning Experience