Project Design Phase–II

Technology Stack (Architecture & Stack)

Team ID: 6D24F58C3BFCDC0B2754A4CE3927F280
Project Name: Medical Inventory Management System (Salesforce)
Maximum Marks: 4 Marks

Technical Architecture

The **Medical Inventory Management System (Salesforce)** is designed as a cloud-based, modular, and scalable architecture that connects suppliers, purchase orders, products, and expiry tracking through a unified Salesforce platform.

The system follows a **multi-tier architecture**, combining user interface, business logic, data layer, and integration components.
It operates entirely on the Salesforce Cloud, ensuring security, reliability, and high availability without external server maintenance.

Guidelines Followed:

- Includes application logic and data processing blocks.
- Distinguishes between **Salesforce Cloud (PaaS)** and **Local User Interface**.
- Defines external integrations such as supplier APIs and hospital ERP connections.
- Indicates all **data storage, workflow automation, and analytics** components.
- Integrates optional support for **AI-driven inventory predictions** (future scope).

Table-1: Components & Technologies

S.No	Component	Description	Technology
1	**User Interface**	Users interact via Salesforce Lightning Experience (Admin, Pharmacist, Storekeeper).	Salesforce Lightning Web Interface
2	**Application Logic–1**	Handles supplier, product, and purchase order operations.	Salesforce Apex Classes, Flow Builder

3	**Application Logic–2**	Manages expiry alerts and automated reorder logic.	Process Builder, Scheduled Apex Jobs
4	**Application Logic–3**	Generates dashboards and real-time analytics for suppliers and stock.	Salesforce Reports & Dashboards
5	**Database (Core Data Storage)**	Stores supplier, product, purchase order, and expiry details.	Salesforce Standard & Custom Objects
6	**Cloud Database**	Data managed in Salesforce multi-tenant cloud infrastructure.	Salesforce Cloud (PaaS)
7	**File Storage**	Stores supplier documents, purchase receipts, and audit logs.	Salesforce Files, Attachments, ContentVersion
8	**External API–1 (Integration)**	Integration with external ERP or hospital billing system for order reconciliation.	REST API / Webhooks
9	**External API–2 (Optional)**	Integration with pharmacy inventory or supplier APIs for automatic updates.	RESTful JSON API
10	**Machine Learning Model (Optional)**	Predicts reorder points and demand based on usage trends (future upgrade).	TensorFlow Model integrated via Apex Callouts
11	**Infrastructure (Server / Cloud)**	Fully cloud-hosted and managed under Salesforce SaaS model.	Salesforce Cloud Platform (SaaS/PaaS)

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1	**Open-Source Frameworks**	Not applicable (Salesforce is a proprietary platform).	–
2	**Security Implementations**	Uses multi-layered security with profiles, roles, and field-level access.	Salesforce Shield, Profiles, Permission Sets
3	**Scalable Architecture**	Horizontally scalable cloud infrastructure managed by Salesforce.	Salesforce Hyperforce Cloud Architecture

4	**Availability**	High uptime (99.9%) with redundant instances across regions.	Load-balanced Salesforce Data Centers
5	**Performance**	Optimized through indexed queries, caching, and asynchronous jobs.	SOQL Optimization, Apex Batch Jobs
6	**Data Backup & Recovery**	Automated daily backups and recovery options via Salesforce trust architecture.	Salesforce Data Recovery Services
7	**Compliance**	Ensures healthcare data compliance (HIPAA-ready configuration).	Salesforce Security & Compliance Framework
8	**Maintainability**	Modular low-code workflows allow easy updates without redeployment.	Salesforce Flow, Declarative Tools

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🧩 Technical Architecture Description

The system's **architecture** ensures that each module — Supplier, Product, Purchase Order, and Expiry Tracking — communicates seamlessly through defined Salesforce relationships and Apex logic.
Data entered through the **Lightning Web Interface** is processed by **Flow Builder** and stored in **Salesforce Objects**. Automated jobs perform expiry checks daily and trigger alerts via the **Notification System**.

External APIs enable integration with hospital ERP or supplier databases for synchronized inventory control.
This architecture maintains high availability, data accuracy, and compliance, while remaining scalable enough to integrate predictive AI modules in future releases.

Example – Solution Architecture Diagram

Figure 1: System Architecture – Medical Inventory Management System (Salesforce)
Flow:
User → Salesforce UI → Apex Logic → Data Objects → Expiry Alerts → Dashboards → External APIs (ERP/Pharmacy Systems)

Reference:

https://developer.salesforce.com/docs/atlas.en-us.platform_events.meta/platform_events/platform_events_intro.htm
https://developer.salesforce.com/docs/atlas.en-us.apexcode.meta/apexcode/apex_intro.htm
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https://developer.salesforce.com/docs/atlas.en-us.lightning.meta/lightning/intro_framework.htm

https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/