

Project Design Phase

Solution Architecture

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Project Name: Medical Inventory Management

Goals of the Architecture

- Ensure **accurate tracking** of medical supplies, purchases, and expiry dates.
- Maintain **data integrity** across supplier, product, and transaction records.
- Automate **alerts and restock processes** to reduce manual intervention.
- Provide **real-time insights and analytics** for better inventory control.
- Improve **operational efficiency and compliance** with healthcare standards.

Key Components

- **Supplier Table:** Stores supplier details such as name, contact information, and product association.
- **Product Table:** Contains product name, description, batch number, stock level, and expiry date.
- **Purchase Order Table:** Records details of orders placed, received, and pending.
- **Inventory Transaction Table:** Logs stock inflow and outflow for transparency.
- **Notification Module:** Triggers alerts for low stock and upcoming expiries.
- **Dashboard & Reports:** Provides visual analytics on supplier performance, stock status, and product usage trends.

Development Phases

1. **Database Setup:**

Create Salesforce objects (tables) for suppliers, products, purchase orders, and transactions.

2. **User Interface Design:**

Build Lightning pages for supplier entry, product catalog, purchase tracking, and stock management.

3. **Automation & Logic:**

Implement **Apex triggers and validation rules** to automatically update stock counts, send expiry alerts, and prevent duplicate entries.

4. **Testing & Validation:**

Simulate real hospital inventory operations — add suppliers, create purchase orders, track product expiry alerts, and test automated workflows.

5. **Reporting & Analytics:**

Generate dashboards showing inventory trends, supplier performance, and consumption patterns for data-driven decision-making.

Solution Architecture Description

The **Medical Inventory Management System** architecture is designed to provide an automated, accurate, and scalable solution for handling medical stock across hospitals and pharmacies.

Built on **Salesforce**, the architecture integrates multiple functional modules including **Supplier Management, Product Tracking, Purchase Orders, and Notifications**.

Each module interacts through defined relationships and automated triggers, ensuring data synchronization and consistency. For example, when a new purchase order is approved, the system automatically updates product stock levels. Similarly, when expiry dates approach, the **Notification Module** sends alerts to staff, ensuring no expired medicines are used.

This cloud-based design ensures **real-time access, security, and scalability** across multiple healthcare branches. The architecture reduces manual workload, enhances safety compliance, and supports smarter decision-making through **analytics dashboards and forecasting capabilities**.

Example – Solution Architecture Diagram

Figure 1: Architecture and Data Flow of Medical Inventory Management System

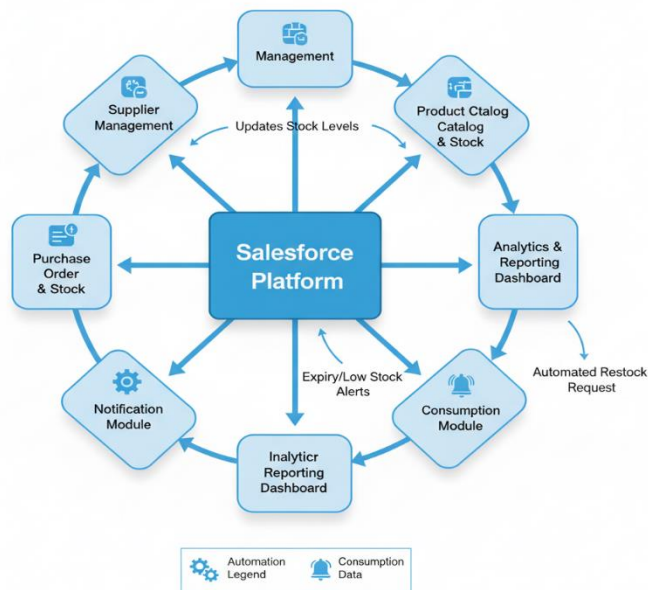


Figure 1: Architecture and Data Flow of the Medical Inventory Management System

(Illustration: A central Salesforce platform connected to modules for Supplier, Product, Purchase Order, Inventory, and Analytics, with data flow arrows showing automation and alert generation.)

Reference

- Salesforce Developers Blog. “*Designing Scalable Architectures for Healthcare Applications.*” (2024)
- HealthIT.gov. “*Digital Transformation in Medical Inventory and Supply Chain Systems.*” (2023)
- AWS Architecture Blog. “*Cloud-Based Architecture for Healthcare Data Management.*” (2024)