Project Design Phase

Solution Architecture

Date	1 November 2025
Team ID	NM2025TMID03427
Project Name	Medical Inventory Management
Maximum Marks	5 marks

Goals of the Architecture

• Ensure precise and reliable tracking of medical supplies, purchase orders, and product expiry dates.
• Maintain consistent data integrity across supplier, product, and transaction records.
• Automate stock alerts, restocking processes, and expiry notifications to minimize manual effort.
• Deliver real-time analytics and insights for improved visibility and control over inventory.
• Enhance operational efficiency while ensuring full compliance with healthcare regulations and standards.

Key Components

• **Supplier Table:** Stores detailed supplier information, including name, contact details, and associated product data.
• **Product Table:** Maintains product-specific details such as name, description, batch number, stock quantity, and expiry date.
• **Purchase Order Table:** Captures all purchase order information, including items ordered, received quantities, and pending deliveries.
• **Inventory Transaction Table:** Logs every stock inflow and outflow transaction, providing complete transparency and auditability.
• **Notification Module:** Generates automatic alerts for low stock, upcoming expirations, and overdue deliveries.
• **Dashboard & Reports:** Offers visual analytics on supplier performance, stock trends, consumption rates, and overall inventory health.

Development Phases

1. **Database Setup:**
   Create Salesforce objects and relationships for suppliers, products, purchase orders, and inventory transactions to establish the system's data foundation.
2. **User Interface Design:**
   Develop intuitive Lightning pages for supplier management, product cataloging, purchase tracking, and stock updates to enhance user experience.
3. **Automation & Logic:**
   Implement **Apex triggers**, workflows, and validation rules to automate processes such as stock updates, expiry alerts, and duplicate prevention.
4. **Testing & Validation:**
   Simulate real-world hospital inventory scenarios — add suppliers, place purchase orders, monitor expirations, and validate automated alerts for accuracy and reliability.
5. **Reporting & Analytics:**
   Design dashboards and reports to visualize inventory performance, supplier efficiency, and consumption metrics for strategic decision-making.

Solution Architecture Description

The **Medical Inventory Management System architecture** is built to deliver an accurate, automated, and scalable solution for managing medical inventory across healthcare facilities.

Leveraging **Salesforce's cloud platform**, the architecture seamlessly integrates multiple modules, including **Supplier Management, Product Tracking, Purchase Order Processing, and Notifications**. Each component is interconnected through well-defined relationships and automation logic to ensure data consistency and synchronization.

For instance, once a purchase order is approved, the system automatically updates stock levels in the Product Table. Similarly, as product expiry dates approach, the **Notification Module** triggers alerts to relevant staff, preventing the use of expired medicines and ensuring compliance with healthcare safety standards.

The cloud-based design supports **real-time data access**, strong security, and scalability across multiple hospitals or pharmacy branches. By automating routine operations, reducing human error, and providing analytical dashboards with forecasting insights, the architecture

empowers healthcare organizations to make smarter, data-driven decisions while maintaining patient safety and regulatory compliance

Example – Solution Architecture Diagram

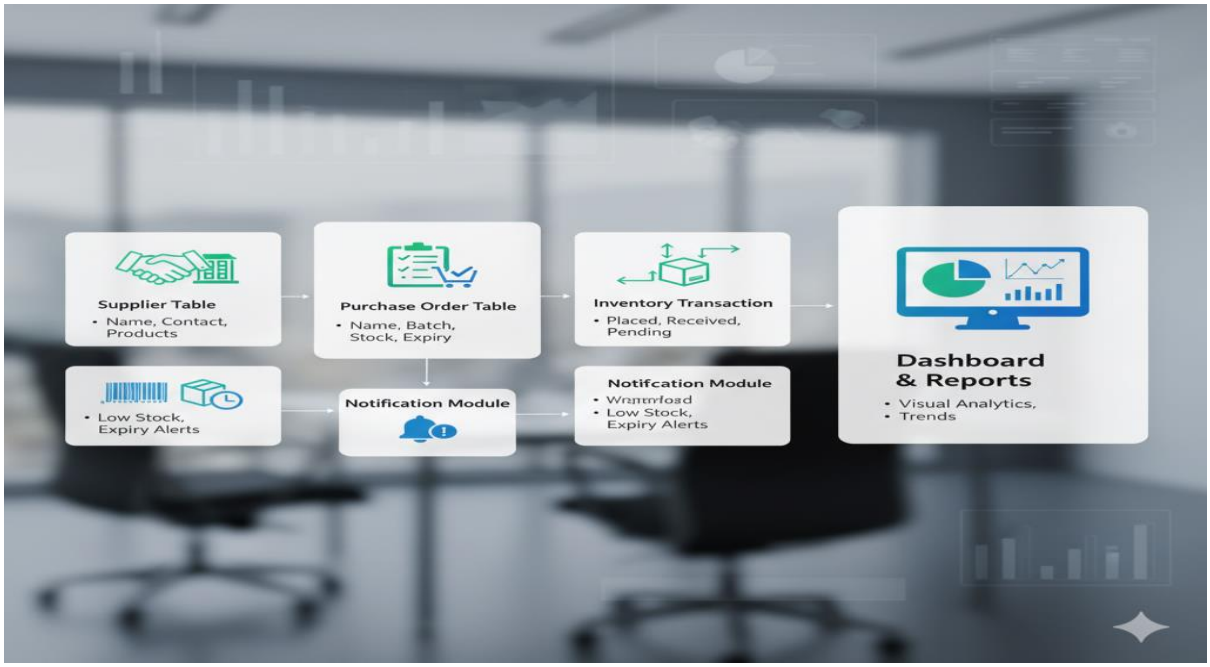

Figure 1: Architecture and Data Flow of the Medical Inventory Management System
(Illustration: A central Salesforce platform connected to modules for Supplier, Product, Purchase Order, Inventory, and Analytics, with data flow arrows showing automation and alert generation.)

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)