

PROJECT DESIGN PHASE

SOLUTION ARCHITECTURE

DATE	1 NOVEMBER 2025
TEAM ID	NM2025TMID02682
PROJECT NAME	MEDICAL INVENTORY MANAGEMENT
MAXIMUM MARKS	4 MARKS

Solution Architecture

Goals of the Architecture:

- Ensure accurate real-time tracking of medical supplies and stock levels.
- Automate alerts for low inventory and expiry management.
- Maintain data integrity between suppliers, inventory, and usage records.
- Streamline hospital operations through efficient inventory workflows.

Key Components:

- Inventory Table: Stores details of all medical items (e.g., item name, category, batch number, expiry date, and quantity).
- Supplier Table: Contains vendor and supply chain data.
- Usage/Consumption Table: Logs medical item usage across departments.
- Reorder Management Module: Automates restocking requests when thresholds are reached.
- Business Rules and Workflows: Trigger notifications for low stock or upcoming expirations; prevent dispensing of expired or unapproved items; validate supplier information and incoming batch data.
- Dashboard: Provides a visual summary of inventory status, reorder alerts, and item distribution.

Development Phases:

1. Database Setup: Create tables for inventory, suppliers, and usage tracking.
2. Form and UI Design: Build intuitive interfaces for data entry and search.
3. Business Rule Configuration: Implement rules for validation, stock updates, and expiry alerts.
4. Workflow Automation: Set up reorder and approval processes.
5. Testing and Validation: Verify alerts, rule enforcement, and end-to-end data flow.

6. Reporting: Generate dashboards for inventory insights and audit logs.
Solution Architecture Description:

The Medical Inventory Management System is designed to provide hospitals and clinics with a centralized and automated solution for managing medical supplies. The system maintains a live inventory database that tracks stock levels, expiry dates, and supplier details. When stock levels drop below defined thresholds, automatic reorder requests are generated and sent to suppliers. Expired or low-quality items are flagged to ensure patient safety and regulatory compliance. This architecture integrates Business Rules, Automated Workflows, and Dashboards within a robust framework to reduce manual monitoring, enhance transparency, and ensure that healthcare providers always have essential medical supplies available when needed. The implementation ensures data integrity, traceability, and real-time analytics, supporting operational efficiency across all departments.

Example – Solution Architecture Diagram:

