Project Design Phase

Solution Architecture

Date: 03/11/2025
Team ID: NM2025TMID05036
Project Name: Medical Inventory Management
Maximum Marks: 4 Marks

Goals of the Architecture:

- Ensure accurate and real-time medical stock tracking.
- Provide automated alerts for low stock and expired medicines.
- Maintain data integrity across all inventory transactions.
- Reduce manual work in hospitals and pharmacies through automation.
- Improve patient safety and healthcare efficiency through reliable inventory visibility.

Key Components:

- **Medicine Table** – stores details such as medicine name, batch number, expiry date, and quantity.
- **Supplier Table** – manages supplier information and purchase records.
- **Alert System Module** – triggers notifications for low stock or upcoming expiry.
- **User Interface (Web Dashboard)** – allows pharmacists and admins to view, add, and update inventory.
- **Database (MySQL / Cloud Firestore)** – ensures secure and scalable data storage for all inventory records.

Development Phases:

1. Create medicine and supplier database structure.
2. Design user interface for inventory management.
3. Implement alert mechanisms for low stock and expiry dates.
4. Test CRUD (Create, Read, Update, Delete) operations for data accuracy.
5. Validate notifications and reporting modules.
6. Deploy the system and conduct performance testing.

🧩 **Solution Architecture Description:**

The **Medical Inventory Management** architecture is designed to streamline how hospitals and pharmacies track and manage medicines. It integrates a centralized database with a user-friendly interface that allows real-time updates, automated alerts, and efficient data handling.

The architecture focuses on maintaining accurate medicine records, reducing human errors, and ensuring timely alerts for expired or low-stock medicines. The system follows a modular design — separating inventory data, alert logic, and user interface — making it easier to scale and maintain.

During development, modules for medicine management, supplier records, and alert automation are created and tested for consistency and reliability. This ensures the system supports smooth healthcare operations, minimizes wastage, and strengthens medical service delivery.

Example – Solution Architecture Diagram:

(You can insert your own system diagram here, e.g., data flow showing "User → Web App → Database → Alert Module")

Reference:

https://aws.amazon.com/blogs/industries/voice-applications-in-clinical-research-powered-by-ai-on-aws-part-1-architecture-and-design-considerations/