Project Design Phase – II

Technology Stack (Architecture & Stack)

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

Technical Architecture:

The deliverable includes the architecture diagram and detailed technology stack information as shown below.

Example: Medical Inventory Tracking and Alert System for Hospitals

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

Guidelines:

- Include all processes such as medicine management, alert system, and reporting as part of the application logic.
- Provide infrastructural demarcation (Frontend – Local Web, Backend – Cloud).
- Indicate external interfaces (like APIs for supplier or hospital systems).
- Specify database components and data flow.
- Show integration with alert services for email/SMS notifications.

Table-1: Components & Technologies

S.No	Component	Description	Technology
1.	**User Interface**	Admins and pharmacists interact through a web dashboard to manage inventory.	HTML, CSS, JavaScript, React.js
2.	**Application Logic – 1**	Handles adding, updating, and deleting medicine records.	Node.js / Express.js
3.	**Application Logic – 2**	Monitors expiry dates and generates alerts automatically.	Cron Jobs, Backend Logic
4.	**Application Logic – 3**	Generates and exports reports for management.	Node.js, PDF Generator Library
5.	**Database**	Stores medicine details, supplier info, and stock quantities.	MySQL / Firebase Firestore

S.No	Component	Description	Technology
6.	**Cloud Database**	For remote data backup and scalability.	Google Cloud Firestore / AWS RDS
7.	**File Storage**	Stores generated reports and logs.	AWS S3 / Local File System
8.	**External API – 1**	Used for sending email or SMS alerts to admins.	Twilio API / SendGrid API
9.	**External API – 2**	Optional integration with hospital management systems.	REST API
10.	**Machine Learning Model**	(Optional) Forecast demand for future stock using predictive analytics.	TensorFlow / Scikit-learn
11.	**Infrastructure (Server / Cloud)**	Application hosted on cloud for high availability and performance.	AWS EC2 / Google Cloud Platform

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Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	**Open-Source Frameworks**	Developed using open-source tools and libraries for flexibility.	Node.js, React.js
2.	**Security Implementations**	Secure login, data encryption, and restricted access for admins.	JWT Authentication, HTTPS
3.	**Scalable Architecture**	Can scale horizontally to support multiple hospitals or branches.	Cloud Auto-Scaling
4.	**Availability**	Hosted on a cloud platform ensuring 99.9% uptime.	Load Balancers, Cloud Hosting
5.	**Performance**	Optimized database queries and caching for faster response times.	Indexed Tables, Redis Cache