Project Design Phase

Solution Architecture

Date	31 October 2025
Team ID	NM2025TMID06633
Project Name	Medical Inventory Management
Maximum Marks	2 Marks

Introduction

The Solution Architecture for the Medical Inventory Management System defines the framework that enables hospitals to efficiently monitor, track, and manage medical supplies in real-time. By integrating technologies such as RFID, IoT, and cloud computing, the architecture supports automated data collection, predictive analytics, and secure data sharing across departments.

Goals of the Architecture

The primary goals of this architecture are to: 1. Ensure real-time visibility of medical stock using RFID-enabled automation. 2. Reduce manual errors and avoid stock shortages or overstocking. 3. Provide cloud-based synchronization for seamless hospital-wide access. 4. Integrate predictive AI for demand forecasting and restocking alerts. 5. Improve patient care by ensuring the availability of essential supplies.

Key Components

The key components of the Medical Inventory Management architecture include: RFID Tags and Readers, Cloud or On-premise Server, Database System, AI Engine, Mobile Hospital App, and EHR Integration.

Development Phases

The development process follows four main phases: 1. Requirement Analysis, 2. System Design, 3. Implementation, 4. Testing & Deployment.

Solution Architecture Description

The architecture operates through an interconnected system of RFID-enabled tracking devices and a cloud-based management platform. Each inventory item is tagged with an RFID chip, which communicates with RFID readers placed across hospital departments. The collected data is transmitted to the cloud server, where AI-driven analytics predict demand and alert staff about low or expiring stocks. Integration with EHR ensures that stock data aligns with patient prescriptions and usage patterns.

Conclusion

The Medical Inventory Management Solution Architecture provides a scalable, automated, and data-driven framework for hospitals to manage medical assets efficiently. Through IoT and AI integration, it ensures continuous availability of supplies while minimizing errors and improving decision-making.

Reference

https://www.scnsoft.com/blog/hospital-inventory-management