

# Project Design Phase

## Problem – Solution Fit Template

Date	7 Nov 2025
Team ID	NM2025TMID06700
Project Name	Medical inventory management
Marks	2 Marks

### Problem–Solution Template: Medical Inventory Management System

## 1. Problem Statement

Hospitals, clinics, and pharmacies face challenges in managing medical inventory. Manual tracking methods (paper/excel) often lead to:

- Stockouts or overstocking of critical medical supplies
- Expired drugs not being identified on time
- Lack of real-time visibility of inventory across departments
- Delays in reporting and restocking
- Increased operational cost and inefficiencies

These issues affect patient care, financial management, and safety compliance.

## 2. Goal (Objective)

To design a **Medical Inventory Management System (MIMS)** that automates inventory tracking, reduces waste, and ensures availability of required medical supplies at the right time.

## 3. Scope

The system will:

- Maintain records of all medical items (drugs, equipment, consumables)
- Monitor stock levels, expiry dates, and batch numbers
- Generate alerts and reports
- Support multi-location inventory access (pharmacy, wards, stores)
- Enable user roles (admin, pharmacist, staff)

## 4. Stakeholders

Stakeholder	Role / Responsibility
Hospital Admin	Approves stock purchase & view reports
Pharmacist/Inventory Manager	Updates inventory, checks expiry
Medical Staff	Request items
Vendor/Supplier	Supplies inventory

## 5. Solution Overview

A centralized **web/mobile application** that:

- Tracks inventory levels in real time
- Uses barcode/RFID for quick scanning
- Sends notifications when stock is low or near expiry
- Generates usage and audit reports
- Auto-reorders based on threshold values

## 6. Proposed Solution Features

### ✓ Functional Requirements

ID	Requirement
FR1	Login and role-based authentication
FR2	Add, update, or delete inventory items
FR3	Real-time stock level tracking
FR4	Barcode/RFID scanning for item identification
FR5	Low-stock and expiry alerts
FR6	Generate inventory and audit reports
FR7	Purchase request and vendor management

### ✓ Non-Functional Requirements

Category	Requirement
Performance	Stock check/update < 2 seconds
Security	Data encryption, role-based access
Reliability	System available $\geq 99.5\%$ uptime
Scalability	Handles growing inventory data
Usability	Intuitive UI for medical staff

## 7. Technology Stack (Example)

Layer	Technology
Frontend	React / Angular / Flutter
Backend	Node.js / Java Spring Boot / Python Django
Database	MySQL / PostgreSQL / MongoDB
Hardware Integrations	Barcode / RFID Scanner
Hosting	AWS / Azure / On-premise server

## 8. Success Metrics (KPIs)

Metric	Expected Improvement
Stock accuracy	↑ 90%
Expired item waste	↓ 50%
Inventory processing time	↓ 70%
Downtime for critical supplies	↓ 80%

## 9. Expected Outcomes

- Reduced medicine wastage due to expiry
- Faster decision-making with real-time visibility
- Improved patient care with timely availability of supplies
- Audit-ready digital records for compliance