Project Title: Medical Inventory Management System (Salesforce Platform)

Date: November 02, 2025

Team ID: NM2025TMID01274

Maximum Marks: 4 Marks

Phase 5: Project Design Phase II - Solution Requirements

Functional Requirements

The following are the functional requirements for the Medical Inventory Management System Salesforce platform:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Medical Product Registration	Registration through Form; Entry via Barcode/SKU; Batch Import for Multiple Products
FR-2	Product Verification	Product code validation; Supplier credential verification; Regulatory compliance confirmation
FR-3	Product Listing & Catalog	Staff can list medical products (name, code, quantity, units, expiry date, lot number, pricing, image)
FR-4	Inventory Location Setup	Healthcare facilities can register storage locations (warehouses, departments, surgical suites, field locations); Define reorder thresholds and minimum stock levels
FR-5	Location Verification	Location credential validation; Capacity assessment; Contact person confirmation
FR-6	Supplier Registration	Suppliers can create profiles with availability, service hours, and delivery information
FR-7	Automated Reorder Assignment	System automatically creates purchase orders and assigns delivery tasks to suppliers based on stock levels and reorder points
FR-8	Reorder Notification	Procurement staff receive real-time SMS/email notifications for items below reorder thresholds
FR-9	Status Tracking	Staff can update inventory receipt and consumption status (Ordered, Received, Stocked, Consumed) via mobile app/web
FR-10	Expiry Date Confirmation	System alerts staff of approaching expiry dates and confirms product rotation and removal
FR-11	Data Protection Rules	System prevents deletion of medical products assigned to active inventory records or pending orders
FR-12	Transaction Protection	System prevents deletion of inventory transactions with recorded usage or pending reconciliation
FR-13	Dashboard Reporting	Real-time dashboards show: inventory levels by location, items below reorder points, products approaching expiry, consumption rates, cost per unit, waste reduction %

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-14	Analytics & Insights	Historical reports, product usage trends, supplier performance, seasonal consumption patterns, cost analysis
FR-15	Audit Trail & Compliance	System captures and displays complete audit logs showing all modifications to inventory records, lot tracking, and regulatory compliance documentation

Non-Functional Requirements

The following are the non-functional requirements for the Medical Inventory Management System Salesforce platform:

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	The platform interface should be intuitive and user-friendly for all stakeholders (procurement officers, clinical staff, administrators, suppliers) with minimal training required. Mobile app must be responsive and accessible for field staff.
NFR-2	Security	Only authorized admins and assigned staff can access/update inventory records and purchase orders. Product and patient-related information must be encrypted. Two-factor authentication for sensitive operations and data exports.
NFR-3	Reliability	The system must correctly validate all inventory records before preventing deletion. Zero data loss for completed transactions. 99.5% uptime guarantee for production system.
NFR-4	Performance	Reorder checks and validation must occur within <2 seconds. Dashboard reports must load within <5 seconds. Real-time notifications delivered within <30 seconds of threshold trigger. Barcode scanning response <1 second.
NFR-5	Availability	The platform should be accessible 24/7 for clinical staff to record consumption and view inventory. Scheduled maintenance windows should not exceed 2 hours/month, preferably during low-usage hours.
NFR-6	Scalability	The system must handle 10x growth in inventory volume (products, locations, transactions) without performance degradation. Support simultaneous tracking of 10,000+ inventory records daily. Autoscaling cloud infrastructure.
NFR-7	Maintainability	Clean, well-documented code with modular design for easy updates. API-driven architecture for future integrations with EHR systems, barcode scanners, and supplier ordering platforms.
NFR-8	Compliance	HIPAA compliance for healthcare data; FDA compliance for medical device tracking; adherence to healthcare data security regulations; audit logs for all data modifications; transparent data privacy policy.
NFR-9	Compatibility	Support iOS, Android, Windows, and macOS. Compatible with modern web browsers (Chrome, Firefox, Safari, Edge). Works on devices with limited connectivity (offline mode support for barcode scanning).
NFR- 10	Disaster Recovery	Daily automated backups; disaster recovery plan with <4-hour RTO (Recovery Time Objective) and <1-hour RPO (Recovery Point Objective). Geographically redundant backup systems.

Acceptance Criteria

Requirement	Acceptance Criteria

FR-1 to FR-6	All registration forms functional; barcode/SKU verification working; batch import processing 500+ products successfully
FR-7 to FR-9	Automated assignment of 95%+ reorder tasks; notifications delivered within 30 seconds; <2% assignment errors
FR-10 to FR-12	Expiry date alerts capture 100% of approaching products; deletion prevention working 100% for products in active use; no accidental data loss
FR-13 to FR-15	Dashboards load <5 seconds; audit reports accurate within 99.9%; compliance documentation complete for regulatory review
NFR-1 to NFR- 5	UI SUS (System Usability Scale) ≥ 70; zero unauthorized access incidents; <2 sec response time for 95% of requests; 99.5% uptime
NFR-6 to NFR- 10	Handle 10,000 simultaneous users; support 1000+ inventory updates/day; clean code with >80% test coverage; HIPAA/FDA compliant; 4-hour RTO

System Architecture & Technical Specifications

Technology Stack

Component	Technology
Cloud Platform	Salesforce Platform-as-a-Service (PaaS) with Health Cloud
Frontend	Lightning Web Components (LWC) for web; Salesforce Mobile App for field staff
Backend	Salesforce Apex classes and REST APIs
Database	Salesforce SOQL/database with enhanced security
Automation	Salesforce Flows, Process Builder, Business Rules, Validation Rules
Integration	REST APIs for barcode scanners (Zebra, Symbol), EHR systems (Epic, Cerner), SMS notifications (Twilio), email services (SendGrid)
Security	OAuth 2.0, AES encryption at rest and in transit, SSL/TLS, Field-level security

Data Model & Custom Objects

Medical_Product: Product code, name, description, unit of measure, pricing, supplier ID, regulatory classification, safety data

Inventory_Location: Location name, type (warehouse/department/suite), capacity, reorder threshold, minimum stock level, contact person, address

Supplier: Name, contact information, service hours, delivery zones, performance rating, payment terms, delivery lead time

Usage_Record: Product ID, location ID, quantity consumed, date/time, staff member, lot number, serial number, procedure/department

Purchase_Order: Product ID, supplier ID, quantity ordered, unit price, order date, expected delivery date, delivery status, received quantity

Inventory_Transaction: Product ID, location ID, transaction type (receipt/consumption/adjustment), quantity, date/time, lot number, user, notes

Key Business Rules

BR No.	Business Rule
BR-1	Prevent deletion of medical products assigned to active inventory records or pending purchase orders
BR-2	Prevent deletion of inventory transactions with recorded usage or pending reconciliation
BR-3	Auto-create purchase orders when stock falls below reorder threshold; auto-notify suppliers
BR-4	Automatic notification triggers on reorder event, delivery receipt, and expiry date approaches
BR-5	Audit log all critical operations (product creation/deletion, stock adjustments, delivery confirmations) with timestamp and user identification
BR-6	Enforce FEFO (First-Expired-First-Out) inventory rotation based on lot number and expiry date
BR-7	Prevent stock consumption if product quantity is insufficient; trigger alert notification

Constraints & Dependencies

Constraints

- **Budget:** Limited for development; primarily leveraging Salesforce native features and opensource integrations
- **Timeline:** 27 days for complete development, testing, and deployment
- **Team Size:** 4 members with specific healthcare IT and Salesforce skill sets
- **Data Privacy:** HIPAA, FDA, and healthcare data security compliance required
- **System Integration:** Must work with existing EHR systems and hospital infrastructure

Dependencies

- Salesforce platform availability and API rate limits
- Third-party barcode scanner/EHR system reliability and integration support
- Healthcare facility IT infrastructure and network connectivity
- Supplier system compatibility and responsiveness for automated ordering
- Staff participation and adoption during pilot testing
- Data accuracy and completeness from healthcare stakeholders

Conclusion

Phase 5 establishes comprehensive functional and non-functional requirements for the Medical Inventory Management System on Salesforce. These requirements ensure the system is secure, scalable, reliable, and compliant with healthcare regulations for all stakeholders including procurement officers, clinical staff, administrators, and suppliers. With clear acceptance criteria and technical specifications, the development team has a precise roadmap to deliver a solution that maximizes inventory management efficiency, ensures

patient safety, minimizes waste, and guarantees regulatory compliance. The defined business rules, data model, and system architecture provide a robust foundation for building an enterprise-grade medical inventory platform that drives operational excellence in healthcare organizations.