

Requirement Analysis

Solution Requirements

Date: 2025-11-10

Team ID: NM2025TMID02283

Project Name: Medical Inventory Management on Salesforce

Maximum Marks / Priority: High

Functional Requirements (Epic → Stories / Sub-tasks)

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR- 1	Item & Catalog Management	Create/edit/delete medical items (drugs, consumables, devices). Fields: SKU, name, description, unit, unit cost, manufacturer, batch/lot, expiry date, storage conditions, controlled substance flag. Bulk import via CSV.
FR- 2	Supplier & Purchase Order Management	Add/manage suppliers. Create Purchase Orders (PO), receive shipments (GRN), record batch & expiry on receipt, attach invoices, match PO → invoice.
FR- 3	Stock In (Receiving)	Record incoming stock by PO or ad-hoc receipt. Assign batch/lot, expiry, storage location, quantity, and auto-update stock levels. Validation for controlled items.
FR- 4	Stock Out (Issue / Dispense)	Issue items to departments, wards, patients or external clinics. Support issuance against requisitions/orders, picklists, and decrement stock by FIFO/FEFO rules.
FR- 5	Requisition & Approval Workflow	Create requisitions (web UI / mobile), multi-level approvals, auto-routing based on thresholds, convert approved requisitions to picklists/issue transactions.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-6	Reorder & Threshold Management	Define min/max and reorder points per item/location. Auto-generate reorder suggestions and replenishment POs or alerts when stock \leq threshold.
FR-7	Expiry, Quarantine & Recall Management	Track expiry per batch. Automatic expiry alerts (configurable window), move near-expiry to quarantine location, support lot recall and bulk actions to mark unusable.
FR-8	Batch / Lot & Serial Number Tracking	Maintain batch/lot and serial tracking where required. Traceability from receipt \rightarrow issue \rightarrow patient/order for at least N months (configurable).
FR-9	Returns & Adjustments	Process returns to supplier, returns from wards/patients, and inventory adjustments with reason codes and approval. Maintain audit trail.
FR-10	Role-Based Access & User Management	Admins can create roles (Pharmacist, Storekeeper, Clinician, Auditor), assign permissions. Only authorized roles can delete items/transactions; support soft delete + restore.
FR-11	Reporting & Dashboards	Prebuilt dashboards: stock levels, near-expiry, slow/fast moving items, consumption by department, vendor performance, PO status. Custom report builder for admins.
FR-12	Integration (EHR / Accounting / Barcode)	Integrate with EHR for patient dispenses, with accounting for invoices, and with barcode scanners/label printers for receiving/issuing. Support REST APIs and outbound events.
FR-13	Audit Logging & Compliance	Immutable audit log for all inventory transactions, user actions, approvals. Exportable logs for audits and regulatory compliance (HIPAA/GxP where applicable).
FR-14	Notifications & Alerts	Push/email/Salesforce in-app alerts for approvals, low stock, expiry, failed integrations, and recall events. Configurable recipients/thresholds.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-15	Mobile & Offline Support	Mobile interface for scanning, receiving, issuing with limited offline capability and background sync when online.

Acceptance Criteria (examples for key FRs)

- **FR-3 Stock In:** When a GRN is created against a PO with batch and expiry, the system increases available stock and shows new lot on item ledger. Test: receive 100 units → stock +100; batch visible in lot list.
 - **FR-6 Reorder:** When item quantity ≤ reorder point, system generates reorder suggestion and notifies purchasing. Test: set reorder point 50, current stock 49 → alert generated.
 - **FR-7 Expiry:** Items with expiry within configured window (e.g., 90 days) appear in near-expiry report and receive quarantine option.
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Non-Functional Requirements

NFR No.	Non-Functional Requirement	Description / Measurable Criteria
NFR-1	Usability	Intuitive UI for pharmacists and storekeepers. Typical flows (receive/issue/reconcile) ≤ 3 clicks from main screen. Provide quick-search and barcode scanning.
NFR-2	Security & Compliance	Role-based access control, field-level encryption for PHI, TLS in transit, encrypted at rest. Meet applicable regulations (HIPAA/GxP/local healthcare laws). Two-factor for admin roles.
NFR-3	Reliability / Data Integrity	Transactional integrity — no lost or partial updates. Use ACID transactions for stock updates; reconcile jobs run nightly. Error rate < 0.1% per month.
NFR-4	Performance	Typical receive/issue transaction completes < 2s under normal load. Reports load within 5s for standard date ranges. API response time < 300ms for single record fetch.

NFR No.	Non-Functional Requirement	Description / Measurable Criteria
NFR-5	Availability	99.9% system uptime during business hours. Maintenance windows announced and scheduled off-peak.
NFR-6	Scalability	Able to support growth to 10k SKUs and 100 concurrent users without degradation. Horizontal scaling for web/API layers.
NFR-7	Auditability & Traceability	Immutable audit trails stored for configurable retention (e.g., 7 years). All create/update/delete operations logged with user, timestamp, and reason.
NFR-8	Backup & Disaster Recovery	Daily backups, point-in-time recovery for DB, RTO < 4 hours, RPO < 1 hour for critical systems.
NFR-9	Interoperability	Provide REST APIs and outbound events (Platform Events) for integrations. Support HL7/FHIR adapter for EHR integrations (if required).
NFR-10	Maintainability & Extensibility	Modular Apex/Lightning components, well-documented APIs, automated tests (unit ≥ 80% coverage) and CI/CD pipeline for deployments.
NFR-11	Localization & Accessibility	Support regional date/currency formats, multiple languages if required. Web Content Accessibility Guidelines (WCAG) AA compliance for key screens.
NFR-12	Monitoring & Alerting	Real-time monitoring (errors, integration failures, job failures). Alerting to SRE/ops via email/Slack when key thresholds hit.

Data Model (high level)

- **Item (SKU):** id, name, sku, unit, category, storage_location, min_qty, max_qty, reorder_point, controlled_flag.
- **Batch / Lot:** id, item_id, batch_number, quantity_on_hand, expiry_date, received_date, location.
- **Transaction (Ledger):** id, type(receipt/issue/adjustment/return), item_id, batch_id, qty, source_ref (PO/Requisition), user_id, timestamp, reason.
- **Supplier, PO, Requisition, User, Role, AuditLog**

Example User Stories (for sprint planning)

- As a Pharmacy Storekeeper, I want to scan a supplier box barcode and record a GRN so I can update inventory quickly.
- As a Department Nurse, I want to request consumables and have the request routed for approval so I can get supplies without manual forms.
- As an Auditor, I want to export immutable transaction logs for a date range so I can verify compliance.

Implementation Notes / Salesforce Considerations

- Use **Salesforce Objects** (custom objects) for Item, Batch, Transaction; Lightning pages for UI.
 - Use **Platform Events** for integration and async processing (receipts, large imports).
 - Use **Apex** for critical transactional logic (stock updates) with database transactions to ensure consistency.
 - Leverage **Flow** for approval flows and common automations where possible.
 - Use **Shield** (Platform Encryption & Event Monitoring) if PHI / regulatory requirements exist.
 - Add **Test Classes** for Apex with positive/negative scenarios and bulk tests.
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