

# Requirement Analysis

## Solution Requirements

**Date:** 2025-11-10

**Team ID:** NM2025TMID02283

**Project Name:** Medical Inventory Management on Salesforce

**Maximum Marks / Priority:** High

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## Functional Requirements (Epic → Stories / Sub-tasks)

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR- Item & Catalog	1 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- Purchase Order	2 Management	Supplier & Add/manage suppliers. Create Purchase Orders (PO), receive shipments (GRN), record batch & expiry on receipt, attach invoices, match PO → invoice.
FR- Stock In (Receiving)	3	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- Stock Out (Issue / Dispense)	4	Issue items to departments, wards, patients or external clinics. Support issuance against requisitions/orders, picklists, and decrement stock by FIFO/FEFO rules.
FR- Requisition & Approval Workflow	5	Create requisitions (web UI / mobile), multi-level approvals, auto-routing based on thresholds, convert approved requisitions to picklists/issue transactions.

<b>FR No.</b>	<b>Functional Requirement (Epic)</b>	<b>Sub Requirement (Story / Sub-Task)</b>
<b>FR- 6</b>	Reorder & Threshold Management	Define min/max and reorder points per item/location. Auto-generate reorder suggestions and replenishment POs or alerts when stock ≤ threshold.
<b>FR- 7</b>	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.
<b>FR- 8</b>	Batch / Lot & Serial Number Tracking	Maintain batch/lot and serial tracking where required. Traceability from receipt → issue → patient/order for at least N months (configurable).
<b>FR- 9</b>	Returns & Adjustments	Process returns to supplier, returns from wards/patients, and inventory adjustments with reason codes and approval. Maintain audit trail.
<b>FR- 10</b>	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.
<b>FR- 11</b>	Reporting & Dashboards	Prebuilt dashboards: stock levels, near-expiry, slow/fast moving items, consumption by department, vendor performance, PO status. Custom report builder for admins.
<b>FR- 12</b>	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.
<b>FR- 13</b>	Audit Logging & Compliance	Immutable audit log for all inventory transactions, user actions, approvals. Exportable logs for audits and regulatory compliance (HIPAA/GxP where applicable).
<b>FR- 14</b>	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- Mobile & Offline Support 15		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.

## Non-Functional Requirements

NFR No.	Non-Functional Requirement	Description / Measurable Criteria
NFR- 1		Intuitive UI for pharmacists and storekeepers. Typical flows Usability (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		Typical receive/issue transaction completes < 2s under normal performance load. Reports load within 5s for standard date ranges. API response time < 300ms for single record fetch.

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

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## 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.
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## 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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