**PROJECT DESIGN**

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| --- | --- |
| Date | 29-05-2025 |
| Team ID | LTVIP2025TMID28829 |
| Project Name | Medical Inventory Management |
| Maximum Marks | 4 Marks |

**4.2 Proposed Solution**

**Introduction**

The **Medical Inventory Management System** is designed as a scalable, cloud-based solution built on Salesforce to eliminate inefficiencies in managing hospital stock, procurement, expiry tracking, and reporting. The proposed solution addresses real-time operational needs of **Inventory Managers, Procurement Officers, Vendors, and Administrators**, while complying with hospital policies and audit standards.

This section describes the **proposed solution architecture, module-wise functions, key workflows**, and how the system solves the problems defined in earlier phases.

**4.2.1 Solution Goals**

The solution is designed to achieve the following primary objectives:

| **Objective** | **Description** |
| --- | --- |
| **Automate** | Eliminate manual paperwork for stock tracking, requisitions, and reporting. |
| **Alert** | Enable timely alerts for low stock and expiry-based items. |
| **Optimize** | Ensure efficient procurement and vendor performance monitoring. |
| **Visualize** | Provide clear dashboards for hospital administrators and department heads. |
| **Secure & Audit** | Maintain accurate logs of inventory movement and user actions. |

**4.2.2 Solution Overview**

The system consists of **6 core modules**, each mapped to a user role and corresponding business process:

| **Module** | **Primary User** | **Key Features** |
| --- | --- | --- |
| Inventory Control | Inventory Manager | Add/edit stock, track expiry, receive items, set thresholds |
| Purchase Management | Procurement Officer | Raise requisitions, generate POs, manage vendor communications |
| Vendor Management | Admin, Procurement | Maintain vendor database, delivery history, and feedback |
| Notifications & Alerts | All Roles | Triggered by low stock, expiry, pending approvals |
| Reporting & Dashboards | Admin | Graphical insights into usage, wastage, procurement cycle |
| Audit & Compliance Logs | Admin, Auditors | Track user activities, changes, and transaction logs |

**4.2.3 End-to-End Workflow**

Below is an outline of the **core process flow** that binds all modules:

1. **Stock Update**
   * Inventory Manager adds or updates stock records using a form.
   * Expiry date, quantity, and vendor details are entered.
   * System auto-checks threshold and triggers alerts if needed.
2. **Requisition & Approval**
   * If stock is low, the Inventory Manager creates a requisition.
   * A multi-level approval process is triggered (e.g., Head of Department → Finance).
   * Upon approval, a PO is auto-generated and linked to the vendor.
3. **Vendor Interaction**
   * PO is emailed to the vendor.
   * Upon delivery, items are checked in, and discrepancies (if any) are recorded.
4. **Stock Receiving & Verification**
   * Delivered quantity is logged using barcode or manual input.
   * Inventory is updated, and the purchase record is closed.
5. **Expiry & Idle Stock Monitoring**
   * Weekly jobs scan stock for upcoming expiry or no-movement.
   * Users receive alerts and can act early to avoid wastage.
6. **Report Generation**
   * Monthly and ad-hoc reports are available on stock trends, vendor performance, wastage, and compliance.
   * All data is exportable in Excel or PDF formats.

**4.2.4 User Experience Design**

The interface uses **Salesforce Lightning Experience**, offering a clean, responsive design:

* **Homepage Dashboard**: Shows color-coded indicators (e.g., green = sufficient stock, red = expired).
* **Quick Actions**: One-click options to “Add Stock”, “Raise Requisition”, or “Generate Report”.
* **Filters**: Filter by department, category, or vendor to isolate key insights.
* **Role-Specific Layouts**:
  + Inventory Manager sees inventory modules.
  + Procurement Officer sees approval requests and PO tracking.
  + Admin has global visibility and control.

Mobile users can access the same features through the **Salesforce Mobile App**.

**4.2.5 How Salesforce Enables the Solution**

| **Salesforce Feature** | **How It Supports the Solution** |
| --- | --- |
| **Custom Objects** | Models inventory, purchase orders, stock logs, vendors |
| **Flow Builder** | Automates alerts, approval chains, and record creation |
| **Validation Rules** | Prevents entry errors (e.g., expiry date before today, quantity < 0) |
| **Reports & Dashboards** | Visualize data by stock level, expiry, usage, and vendor trends |
| **Profiles & Permission Sets** | Role-based access (e.g., Inventory Manager can't delete vendor records) |
| **Field History Tracking** | Audits critical field changes like stock quantity and expiry |
| **Approval Processes** | Streamlines procurement with defined approver roles and audit trail |
| **Scheduled Flows / Apex Jobs** | Background scans for expiry alerts and monthly summaries |

**4.2.6 Scalability and Flexibility**

The proposed solution is built to scale and adapt:

| **Dimension** | **Scalability Feature** |
| --- | --- |
| **Departments** | Multi-department tagging on inventory and requisitions |
| **Vendors** | Unlimited vendors supported with ratings and performance metrics |
| **Future Integration** | REST API-ready to connect with hospital billing, ERP, or vendor systems |
| **New Requirements** | New fields, rules, or workflows can be added without code through Salesforce Setup tools |

**4.2.7 Benefits of the Proposed Solution**

| **Benefit** | **Details** |
| --- | --- |
| **Reduced Wastage** | Timely alerts prevent expiry-based product losses |
| **Increased Efficiency** | Automated approvals and reporting reduce manual work |
| **Audit Readiness** | Logs and reports maintain compliance with regulatory standards |
| **Real-Time Visibility** | Dashboards offer up-to-date stock insights |
| **Improved Vendor Accountability** | Performance data encourages reliable vendor partnerships |
| **Adaptable UI** | Optimized for desktop and mobile environments |

**Conclusion**

The proposed Salesforce-based solution is **modular, robust, and user-centric**, tailored specifically to solve the operational challenges faced by hospital inventory systems. It replaces outdated manual processes with **automated workflows, real-time reporting, intelligent alerts**, and a scalable structure — all within a **secure and compliant cloud environment**.

This design lays the foundation for the next phase: **Solution Architecture** and detailed **ER & Security Models**, which bring the system to life technically.