**PROJECT DESIGN PHASE**

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| **Date** | 19-06-2025 |
| **Team ID** | LTVIP2025TMID28927 |
| **Project Name** | Medical Inventory Management |
| **Maximum Marks** |  |

**PROBLEM–SOLUTION FIT**

**Objective of Problem–Solution Fit**  
The Problem–Solution Fit phase ensures the Medical Inventory Management system addresses real, high-impact issues faced by healthcare procurement teams and inventory managers. It ensures the solution is not only technically robust but directly aligned with practical day-to-day challenges in medical supply environments.

This phase helps:  
• Align system features with actual hospital/clinic inventory operations  
• Understand the behavioral patterns of procurement officers and staff  
• Increase solution adoption and operational efficiency  
• Minimize inventory-related risks before scaling

1. **Target Customer Segments**

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| Customer Type | Description |
| Inventory Managers | Monitor stock levels, identify low-stock or expiring items, and ensure compliance with medical inventory policies |
| Procurement Officers | Handle purchase orders, vendor communications, and ensure timely replenishment |
| Store Clerks / Staff | Receive stock, update item statuses, and maintain inventory logs |
| Hospital Admins | Oversee all inventory operations and require insights for audits and budgeting |

1. **Problem Statement (As-Is Situation)**  
   Healthcare and pharmacy inventory systems often rely on manual tracking or loosely connected spreadsheets, leading to:  
   • Manual purchase order generation  
   • No real-time alert for low or expired stock  
   • Lack of visibility into supplier performance  
   • Communication delays during order approval  
   • Frequent mismatches between ordered vs. received quantities

Key Problems Identified:  
• No centralized tracking of stock movement or expiry  
• Delayed stock replenishment leading to medical risks  
• Errors in pricing or quantity without proper validation  
• No automation in delivery tracking or procurement follow-up  
• Lack of dashboards to monitor supplier reliability or order volume

1. **Current Workaround (Before CRM Solution)**

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| Existing Practice | Limitation |
| Excel sheets to track stock | No real-time updates, error-prone |
| Phone/email to follow up on orders | No delivery tracking, manual effort |
| Manual entry of received items | Inconsistencies in received vs. ordered quantities |
| No expiry alert for medicines/supplies | Risk of using expired products |
| No insights into stock trends | Poor forecasting and budgeting |

1. Proposed Solution (To-Be State)  
   The “Medical Inventory Management” CRM is a Salesforce-based solution designed to automate inventory workflows and ensure secure, trackable stock management in clinical or hospital environments.

Core Solution Features:  
• Product/Medicine Object: Stores stock levels, expiry dates, and batch info  
• Purchase Order Automation: Create, manage, and track Purchase\_Order\_\_c records  
• Delivery Logging: Quantity\_Received and Actual\_Delivery\_Date tracked automatically  
• Trigger-Based Stock Update: Updates Current\_Stock\_Level\_\_c on Product\_\_cpost delivery  
• Expiry/Low Stock Alerts: Dashboards flag critical items using Roll-Up and Formula Fields  
• Email Alerts: Automated emails sent on delivery status or low stock  
• Role-Based Access: Restrict views and edits for different roles (e.g., Clerk vs. Admin)  
• Dashboards/Reports: Monitor supplier trends, order frequency, stock movement

1. How the Solution Solves the Problem

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| Problem | Feature/Function that Solves It |
| Stockout due to missed reorder | Dashboard alerts and expiry triggers |
| Manual stock logging | Record-Triggered Flows and Order\_Item\_\_c automation |
| No delivery tracking | Purchase\_Order\_\_c with status, delivery dates |
| No purchase analytics | Reports on purchase trends, supplier performance |
| Human error in calculations | Formula fields and validation rules |
| Poor access control | Profiles and Permission Sets based on roles |

1. Solution Adoption Channels  
   • Web-based Salesforce Lightning App  
   • Custom Tabs for Products, Orders, Suppliers  
   • Mobile-friendly dashboards for real-time stock checks  
   • Email alerts triggered upon delivery or purchase order creation  
   • Reports and dashboards visible only to authorized profiles
2. Solution Validation  
   The system was tested using test records and validated for:  
   • Trigger-based update of stock level post-delivery  
   • Alerts working for near-expiry and low-stock items  
   • Purchase Order and Delivery flow execution via test flows  
   • Dashboards accurately reflecting order and stock data  
   • Profiles correctly restricting Create/Edit access per role

Problem–Solution Fit Canvas for Medical Inventory Management

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| Section | Description |
| 1. Customer Segment(s) (CS) | - Inventory Managers (Hospitals/Clinics)- Procurement Officers- Admin Staff- Store Clerks |
| 2. Jobs-to-be-Done / Problems (J&P) | - Monitor inventory expiration- Track quantity ordered vs. received- Automate order and stock updates- Ensure secure and validated workflows |
| 3. Triggers (TR) | - Medicine expiry without alerts- Emergency stockouts- Supplier delays- Manual mismatches in data |
| 4. Emotions Before / After (EM) | Before: Stressed, reactive, anxious about complianceAfter: Confident, proactive, in control with clear data |
| 5. Available Solutions (AS) | - Excel/Google Sheets- Email-based orders- Manual reconciliationCons: Disconnected, error-prone, unscalable |
| 6. Customer Constraints (CC) | - Low tech skill in some staff- Budget limitations in small clinics- Resistance to system change |
| 7. Behaviour (BE) | - Check stock manually- Call suppliers for every PO- Use paper GRNs (goods received notes)- Update logs post-delivery manually |
| 8. Channels of Behaviour (CH) | Online: Email for procurement, some cloud spreadsheetsOffline: Paper invoices, verbal updates, manual stock books |
| 9. Problem Root Cause (RC) | - Lack of integrated system- No automation triggers- No data unification between departments |
| 10. Your Solution (SL) | CRM built on Salesforce with:- Custom Objects (Product, Supplier, Order, Delivery)- Trigger for automatic stock updates- Flows for email alerts- Dashboards for inventory trends- Profiles for secure access |

**PROPOSED SOLUTION**

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| S. No. | Parameter | Description |
| 1 | Problem Statement (Problem to be solved) | Hospitals and clinics often lack a centralized, automated system to manage procurement, inventory tracking, supplier coordination, and expiry alerts. Manual tracking using spreadsheets or paper logs results in delayed replenishment, expired stock usage, inventory mismatches, and compliance risks. |
| 2 | Idea / Solution Description | A cloud-based inventory management CRM built on the Salesforce platform tailored for medical supply and pharmacy management. The solution uses custom objects such as Product (medicine/equipment), Purchase Order, Order Item, Inventory Transaction, and Supplier. Key features include:- Low stock and expiry alerts via Dashboards and Flows- Trigger-based stock updates upon delivery- Email notifications for order status- Validation rules to prevent incorrect data entries- Reports and dashboards for procurement and compliance tracking- Role-based access using Profiles and Permission Sets |
| 3 | Novelty / Uniqueness | - Integrates procurement, stock management, delivery tracking, and reporting into a single intelligent system- Specifically designed for medical inventory workflows including batch tracking, expiry monitoring, and supplier performance- Primarily built using Salesforce declarative tools (Flows, Validation Rules) to ensure ease of use and quick deployment |
| 4 | Social Impact / Customer Satisfaction | - Improves operational efficiency, ensuring hospitals never run out of critical medicines or use expired supplies- Enhances staff productivity by eliminating manual logs and redundant tracking- Encourages digital transformation in healthcare supply chain- Supports better patient care through improved inventory availability and reliability |
| 5 | Business Model (Revenue Model) | - Can be offered as a SaaS (Software as a Service) product to hospitals, pharmacies, and clinics- Tiered subscription model based on number of users, storage needs, or feature access- Optional onboarding/training/support services can be monetized for additional revenue |
| 6 | Scalability of the Solution | - Salesforce infrastructure ensures scalability across multi-location hospitals or health networks- Extendable to mobile-based apps for on-the-go inventory checks- Easily integrates with barcode scanners, pharmacy POS systems, and supplier portals- Can be adapted for other inventory-heavy domains like dental clinics or diagnostic labs |

**SOLUTION ARCHITECTURE**

**What is Solution Architecture?**  
Solution Architecture provides the technical blueprint for implementing your business requirements into a working system. It bridges the gap between healthcare inventory challenges (like stock mismanagement or delayed orders) and platform-specific tools (e.g., Salesforce Flows, Apex triggers, validation rules) used to automate and streamline operations.

It includes:

* Structure of system components (custom objects, data relationships)
* Process automation logic and flow behavior
* Technology stack used for development
* User roles and deployment strategy

**Goals of the Solution Architecture for This Project:**

* Leverage Salesforce Lightning to digitize inventory, procurement, and supplier management workflows
* Clearly define custom objects: Product, Purchase Order, Order Item, Inventory Transaction, Supplier
* Automate business processes using Flows, Triggers, and Validation Rules
* Provide secure, role-based access via Profiles and Permission Sets
* Build a scalable, automated, and audit-compliant inventory solution for hospitals or clinics

**Core Components of the Architecture**

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| Layer | Component | Description |
| Presentation Layer | Salesforce Lightning UI | Users (inventory staff, procurement officers, admins) interact with the system via custom Lightning App pages and layouts |
| Business Logic Layer | Record-Triggered Flows, Apex Triggers, Validation Rules | Business automation such as updating inventory after delivery, validating expected vs. actual delivery dates, sending order confirmations |
| Data Layer | Custom Objects: Product, Purchase\_Order\_\_c, Order\_Item\_\_c, Inventory\_Transaction\_\_c, Supplier\_\_c | Stores structured healthcare inventory and procurement data. Objects are linked via Lookup and Master-Detail relationships |
| Security Layer | Profiles, Permission Sets | Role-based access ensures that only authorized staff (e.g., pharmacists, storekeepers) can access specific objects or fields |
| Reporting Layer | Reports and Dashboards | Visual representations of procurement spend, order delivery status, low-stock items, and supplier performance |

📊 Data Flow within the System

**User Journey Flow:**

1. Inventory Manager identifies low stock or upcoming expiries → Dashboard notifies → Product record reviewed
2. New purchase order is initiated → Purchase\_Order\_\_c created
3. Items added → Order\_Item\_\_c records created under the Purchase Order
4. Delivery received → Actual\_Delivery\_Date\_\_c filled, Inventory\_Transaction\_\_c logged
5. Inventory automatically updated → Trigger/Flow updates Product’s Current\_Stock\_Level\_\_c
6. Email sent to stakeholders → Flow notifies supplier or admin about status updates

**Sample Architecture Diagram (Conceptual)**

[Inventory Manager]  
↓   
[Product]  
↓   
[Purchase\_Order\_\_c] ← Lookup to Supplier  
↓ (Master-Detail)   
[Order\_Item\_\_c] ← Lookup to Product  
↓   
[Inventory\_Transaction\_\_c] ← Created when delivery is logged  
↓ (Flow/Trigger)   
[Product stock auto-updated]  
↓ (Flow)   
[Email sent to Supplier/Admin]

**Summary**

The Medical Inventory Management architecture enables:

* Streamlined procurement and stock tracking
* Automation of delivery updates and inventory adjustments
* Improved supplier communication via email automation
* Secure, role-based data handling
* Scalable system fit for multi-department or multi-location healthcare institutions