

SmartBiotech — Phase 10: Final Project Summary

Introduction

The SmartBiotech Lab CRM project was designed as a comprehensive Salesforce application to streamline biotechnology laboratory operations. It focuses on patient management, genetic test processing, doctor collaboration, lab scheduling, and automated reporting. The project was developed in multiple phases covering data modeling, automation, Apex logic, user interface, integrations, and analytics.

Phase 1 — Project Planning

The initial phase defined the scope and objectives of SmartBiotech Lab CRM. Key goals included managing Patients, Doctors, Genetic Tests, Sample in a centralized system; automating test scheduling, cost tracking, and notifications; and providing dashboards for operational and financial insights. Project timelines, resources, and Salesforce capabilities were aligned with biotech lab processes.

Phase 2 — Org Setup & Configuration

The Salesforce org was configured for SmartBiotech operations: Company Profile, Business Hours, and Fiscal Year were defined. Users, Roles, and Profiles (Lab Admin, Doctor, Technician, Finance) were created. Organization-Wide Defaults and Sharing Rules were configured for record-level access. A sandbox was established for testing prior to deployment, ensuring a secure foundation for future development.

Phase 3 — Data Model & Record Types

Custom objects and fields were designed to represent real-world entities: Patient__c, Doctor__c, Genetic_Test__c, Sample__c. Key fields included Test_ID__c, Scheduled_Date__c, Cost__c, Test_Status__c, and Turnaround_Days__c, etc. Record Types were created for different Genetic Test categories, Page Layouts and Compact Layouts were optimized for each role, and relationships ensured data integrity.

Phase 4 — Process Automation

Declarative automation was implemented using Salesforce Flows and Process Builder: FLW_Welcome_Patient sends a welcome email to patients upon registration. Test Scheduling Flow auto-generates Lab Assignments when a Genetic Test is booked. Email Notifications alert lab staff and doctors about test creation and completion. Validation Rules ensure mandatory fields (Test ID, Doctor, Patient) are filled, reducing manual effort and improving consistency.

Phase 5 — Apex Programming

Apex automation extended CRM capabilities: GeneticTestCostTrigger updates Test Status based on Cost. PaymentStatusManager synchronizes payment updates with test records. GeneticTestDateManager calculates expected completion and auto-updates status by schedule. AutoTestScheduler (Schedulable Apex) auto-creates assignments for patients with pending tests. These Apex components introduced advanced automation beyond declarative limits.

Phase 6 — User Interface Development

Custom UIs were built using Lightning App Builder: Record Pages for Patient, Doctor, and Genetic Test with related lists and quick actions. Dynamic forms show relevant fields by status (Pending, In Progress, Completed, etc). Home Page dashboards summarize test counts, upcoming schedules, and payments, ensuring an intuitive user experience for doctors and lab staff.

Phase 7 — Integration & External Access

Integration capabilities were explored: planned support for Email Alerts and APIs for test updates, with future enhancements including integration with external lab devices and hospital systems through Salesforce Connect or Named Credentials. This phase laid the groundwork for SmartBiotech Lab's interoperability expansion.

Phase 8 — Data Management & Deployment

Data for Patients, Doctors, and Test Templates was imported using Data Import Wizard. Backup jobs were configured via Export Services. Deployment was executed using Change Sets between sandbox and production to ensure system reliability and data safety.

Phase 9 — Reporting, Dashboards & Analytics

Comprehensive reporting was built: reports for Genetic Tests by Doctor, Payments by Status & Revenue, and Test Turnaround Performance. Dashboards in the SmartBiotech / Clinical Reports folder visualize lab efficiency, pending tests, and revenue growth. Security reviews covered OWD, session settings, and FLS compliance, providing management with actionable insights.

Conclusion

The SmartBiotech Lab CRM project successfully demonstrated how Salesforce can be used to build a complete, intelligent CRM solution for biotechnology laboratories. All major aspects were covered — from data modeling and process automation to Apex development, user interface customization, integration, and reporting.

The system is scalable, secure, and fully aligned with real-world laboratory operations such as patient registration, genetic test scheduling, cost tracking, and result management. It meets all academic and functional project requirements while showcasing strong automation capabilities.