Project Briefing: Smart Healthcare Outreach Platform

In a recent project, I served as the lead Salesforce administrator and developer for a public health organization needing to digitize patient outreach and program management. They faced challenges with fragmented data, manual tracking, and a lack of visibility into program effectiveness.

I designed and implemented a custom Salesforce solution, the "Smart Healthcare Outreach Platform." This solution leverages the full power of the Salesforce platform, combining standard configuration with advanced custom development to create a secure, scalable system.

Here are the specific use cases that highlight the technical and business value delivered.

1. Use Case: Ensuring Patient Safety with Validation Rules (Standard) 🛡️

- **Business Challenge:** Data integrity is non-negotiable in healthcare. The organization was concerned about data entry errors that could lead to severe patient safety incidents, such as administering a vaccine to a patient with a known allergy.
- **My Solution:** I implemented several critical **Validation Rules** to act as a digital safety net:
    - **Allergy Check:** A rule on the `Vaccination_Record__c` object prevents a user from saving a record if the related patient's Contact has the "Allergy to Vaccine" checkbox ticked.
    - **Risk Justification:** Another rule ensures that if a visit is flagged as "High Risk," the health worker must provide a text justification before the record can be saved.
    - **Data Logic:** Rules to prevent future birthdates ensures basic demographic accuracy .
- **Business Impact:** This directly enhanced patient safety by preventing critical medical errors at the point of data entry and enforcing data quality standards .

2. Use Case: Enforcing Complex Logic with Apex Trigger Handlers ⚡

- **Business Challenge:** Beyond simple field checks, the organization needed to ensure patients were not enrolled in wellness programs they were not eligible for based on complex criteria like age restrictions defined in parent records.
- **My Solution:** I implemented a **Logic-Less Apex Trigger** on the `Patient_Pathway__c` object.
    - **Implementation:** The trigger delegates logic to a handler class, `PatientPathwayTriggerHandler`.
    - **Logic:** Before a record is saved (`before insert`), the code efficiently bulk-queries patient ages and compares them against the `Minimum_Age__c` field on the related `Wellness_Program__c`.

    - **Action:** If the patient is underage, the system blocks the transaction with a custom error message.
- **Business Impact:** This enforces complex compliance rules that standard validation rules cannot handle, ensuring strict adherence to health program guidelines.

3. Use Case: Driving Strategy with Reports and Dashboards 📊

- **Business Challenge:** Program managers and regional health officers were "flying blind," unable to quickly determine program coverage, identify bottlenecks, or allocate resources effectively .
- **My Solution:** I created a suite of analytics tools:
    - **Custom Report Types:** Linked Contacts (Patients) with their Program Enrollments to analyze data across objects.
    - **Regional Health Dashboard:** Built a dashboard featuring a "Health Program Coverage" chart that groups patients by status (Due, Overdue, Completed) and a "High Risk Report" to monitor critical cases by region .
- **Business Impact:** This provided leadership with real-time, actionable insights, allowing them to track campaign progress and make data-driven decisions to improve public health outcomes .

4. Use Case: Professional Document Generation with Visualforce 📄

- **Business Challenge:** Patients required official proof of their completed wellness programs. The manual process of creating certificates was slow and inconsistent.
- **My Solution:** I developed a dynamic **Visualforce Page** (`VFP_ProgramCertificate`) rendered as a high-resolution PDF.
    - **Design:** The page features a custom "Medical Certificate" layout with a full-page background using Static Resources, dynamic patient data, and digital signatures.
    - **Access:** I exposed this via a custom LWC (`programCertificateList`) in the portal, allowing patients to download their certificates instantly.

5. Use Case: Next-Gen Patient Experience (LWC & Glassmorphism) 💻

- **Business Challenge:** The legacy patient experience was disconnected and relied on phone calls. The organization wanted a modern, app-like interface to increase engagement .
- **My Solution:** I built a fully custom **Experience Cloud** portal using **Lightning Web Components (LWC)**:
    - **Custom UI:** Replaced standard layouts with "Dark/Light Glassmorphism" cards, animated gradients, and interactive sliders (`ageBasedNutrients`, `vitaminFinder`).
    - **Dashboards:** Created dedicated LWC dashboards (`appointmentDashboard`, `enrollmentDashboard`) that give patients a visual summary of their specific health data.

- **Business Impact:** The portal empowered patients with self-service access, reducing administrative workload and modernizing the service delivery model .

6. Use Case: Automating Clinical Governance (Approval Processes) ✅

- **Business Challenge:** High-risk patient visits required strict oversight. The previous email-based process was untraceable .
- **My Solution:** I configured a standard **Approval Process** on the `Appointment__c` object. When flagged as "High Risk," the record locks and routes to the manager for sign-off .
- **Business Impact:** This created a permanent, auditable history of clinical decisions .

7. Use Case: Proactive Care with Salesforce Flow 🤖

- **Business Challenge:** Missed follow-up appointments were a major issue due to manual tracking .
- **My Solution:** I utilized Salesforce Flow to automate routine tasks:
  - **Record-Triggered Flow:** Automatically generates a task for the health worker whenever a `Next_Follow_up_Date__c` is populated.
  - **Scheduled Flow:** Runs daily to identify upcoming immunization due dates and assigns reminder tasks 7 days in advance.
- **Business Impact:** These flows shifted the organization to a proactive care model.

Summary of Technical Implementation

Data Model:

- **Objects:** `Wellness_Program__c`, `Patient_Pathway__c` (Enrollment), `Appointment__c`, `Vaccination_Record__c`, `Clinical_Note__c`.
- **Relationships:** Master-Detail and Lookup relationships connecting patients (Contacts) to their clinical data.

Development:

- **Apex:** Trigger Handler pattern for validation; `without sharing` controllers for secure portal data access.
- **LWC:** Extensive use of CSS variables, animations (`@keyframes`), and LMS (Lightning Message Service).
- **Visualforce:** PDF rendering using `applyHtmlTag="true"` and Static Resources for assets.

Security:

- **OWD:** Implemented a **Private** sharing model for Contacts.
- **Sharing Sets:** Configured to grant portal users secure access strictly to their own records .