Final Project Proposal
Topic: VaxSphere - Vaccine Distribution System

Submitted By: Group 16
Akshit Verma - 002059756, Ethan Gomes - 002300753, Varun Singh - 002310584

–Approved by TA Shreya Jaiswal

Problem Statement

The **VaxSphere** project aims to address the inefficiencies and accountability challenges in the **Vaccine Distribution System** caused by siloed systems and fragmented processes for vaccine management. The lack of an integrated solution results in:

1. **Scheduling Issues**: Lack of a unified platform for patients to schedule vaccine appointments.
2. **Inventory Tracking**: Difficulty in tracking vaccine availability and usage at vaccine centers.
3. **Inefficient Logistics**: Poor coordination between vaccine makers, government, and transport providers.
4. **Demand Management**: Inability to identify and address vaccine shortages in real-time.
5. **Payment and Financial Flow Management**: Complications in managing billing and payments between distributors, providers, and other entities.

VaxSphere provides a centralized and streamlined approach to overcome these challenges and ensure efficient vaccine distribution and administration across all levels.

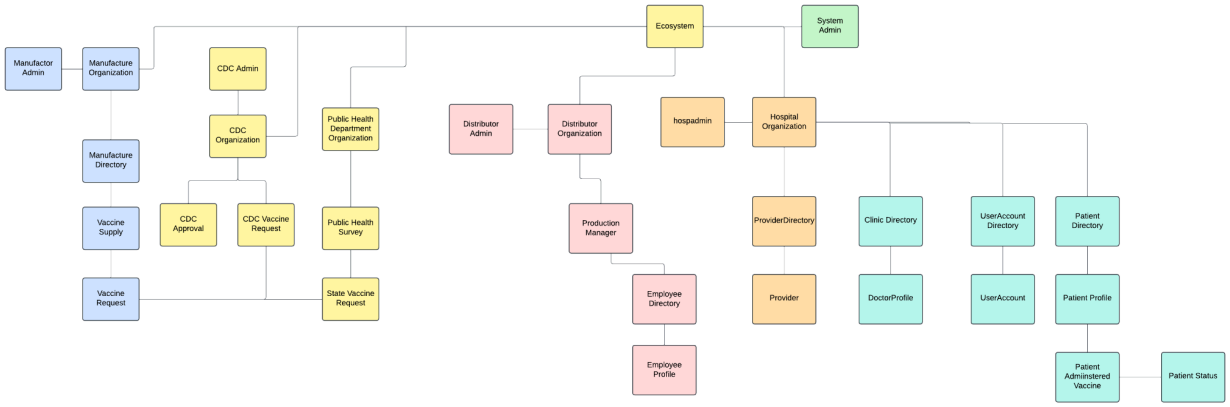
Proposed Solution

The **VaxSphere** system is an integrated Vaccine Distribution System designed to address the challenges of vaccine distribution and management by:

1. **Enabling Patient Scheduling**: Allows patients to schedule vaccinations through a user-friendly interface.
2. **Automating Workflows**: Streamlines processes for vaccine ordering, approval, distribution, and inventory management.
3. **Providing Real-Time Visibility**: Offers transparency into vaccine supply, demand, and stockpile status across all levels.
4. **Implementing Safety Monitoring**: Facilitates tracing of vaccine batches for recalls and adverse events, ensuring public safety.

5. **Enhancing Accountability and Efficiency**: Centralizes operations with role-based access, reducing inefficiencies and improving coordination.
6. **Enabling Transparent Financial Transactions**: Manages billing and payment flows among distributors, providers, and manufacturers efficiently.

High Level Component Diagram



Ecosystem Hierarchy

Enterprises:

Government

- Includes roles like **System Admin**, **PHD Admin**, and **CDC Admin**.
- Manages vaccine allocations, approvals, and coordination with vaccine makers.

Vaccine Makers

- Includes roles like **Manufacturer Admin** and **Manufacturer Employee**.
- Handles vaccine production, batch tracking, and inventory.

Distribution

- Includes roles like **Distributor Admin** and **Employee**.
- Manages vaccine deliveries and logistics.

Vaccine Centers and Hospitals

- Includes roles like **Hospital Admin** and **Provider**.
- Administers vaccines to patients and manages local inventory.

Satellite Clinics

- Includes roles like **Satellite Clinic Provider**.
- Administers vaccines at smaller locations and coordinates with parent vaccine centers.

Organizations:

1. **CDC Administration** (under Government Enterprise)
2. **State Public Health Department (PHD)** (under Government Enterprise)
3. **Vaccine Production** (under Manufacturers)
4. **Warehouse/Logistics Management** (under Distributor)
5. **Local Vaccine Distribution** (under Vaccine Centers)
6. **Clinic Operations** (under Satellite Clinics)
7. **Hospital Management** (under Hospital)
8. **Patient Management** (under Patient)

Roles:

1. **CDC**: Manages national vaccine allocation and monitors supply across states.
2. **Distributor**: Handles the logistics of vaccine delivery from manufacturers to providers.
3. **Enterprise Admin**: Oversees system configurations and user access within the enterprise.
4. **Manufacturer**: Produces and ensures quality control of vaccines for distribution.
5. **Patient**: Receives the vaccine and updates personal health information.
6. **Provider**: Administers vaccines to patients and documents vaccination details.
7. **Public Health Department**: Coordinates and implements vaccination programs at local or state levels.
8. **Satellite Clinic Provider**: Administers vaccines at smaller clinics, often in remote or underserved areas.
9. **System Admin**: Manages overall system operations, user roles, and security within the platform.

Use Cases:

1. **Patient Scheduling**: Patients log in to schedule vaccine appointments at nearby centers.
2. **Inventory Tracking**: Vaccine centers update inventory after every administered dose.
3. **Government Approvals**: Centers request vaccines → State PHD approves → CDC allocates and forwards requests to distributors.
4. **Transport Logistics**: Distributors manage vaccine deliveries to centers.
5. **System Administration:** Manage enterprises, roles, and users through the user management capabilities.

—----------**END OF DOCUMENT**—----------