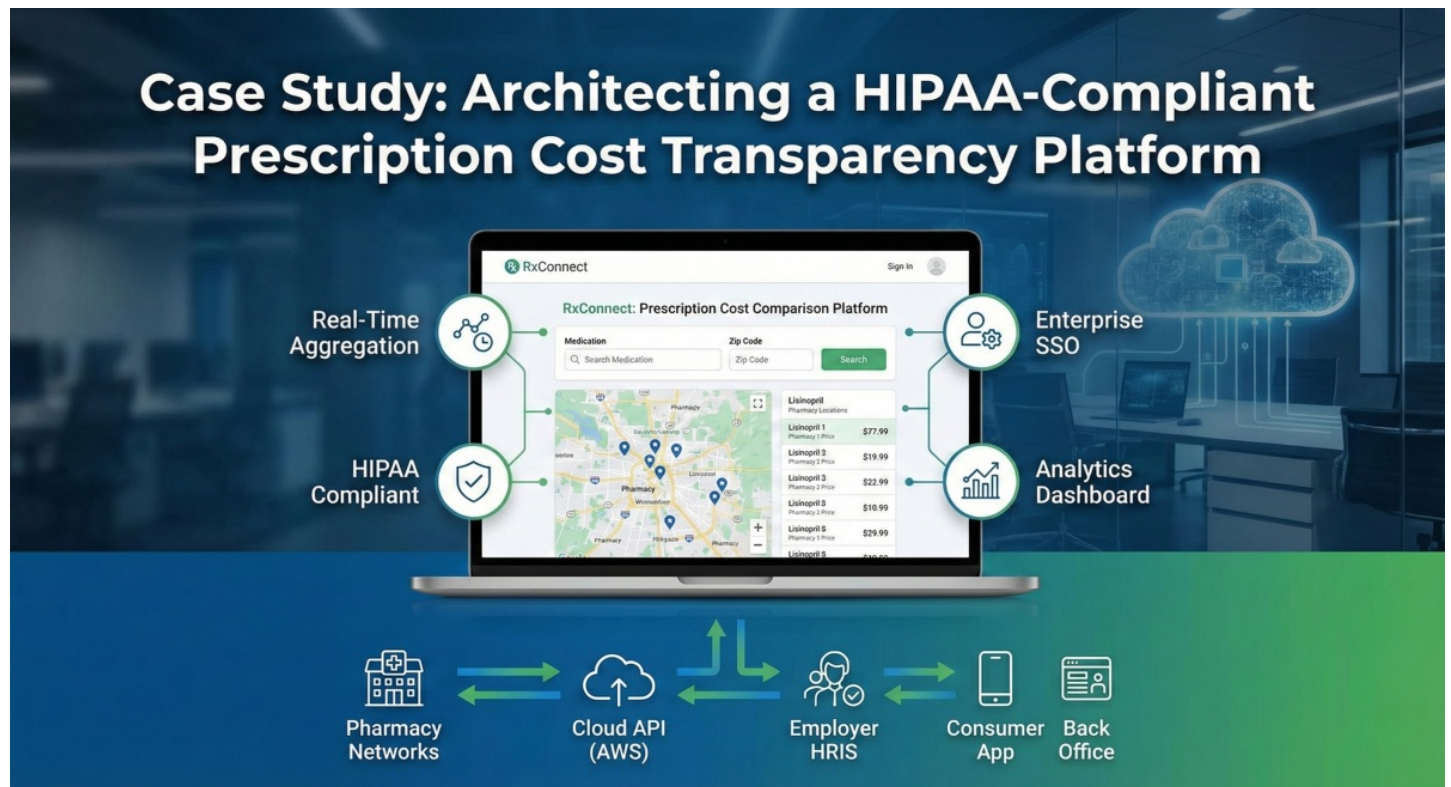


Prescription Cost Comparison Platform



Architecting a HIPAA-Compliant Prescription Cost Transparency Platform

Codebru partnered with a healthcare technology innovator to build a comprehensive ecosystem designed to simplify prescription drug cost comparison. By aggregating real-time data from disparate pharmacy networks, the platform functions as a powerful comparison engine for medications, empowering consumers to locate the lowest prices while enabling employers to offer tangible health benefits to their workforce.

The Challenge

The US prescription drug market is notoriously opaque, with prices varying wildly between pharmacies and benefit networks. Our client required a scalable, high-throughput solution capable of:

1. **Data Aggregation:** Querying multiple pharmacy benefit managers and discount networks in parallel to find the absolute lowest price in milliseconds.
2. **Complex B2B2C Logic:** Serving individual consumers while simultaneously supporting deep integrations with large Employer Groups and HR platforms for automatic employee onboarding.
3. **Financial Accuracy:** Managing a multi-tiered revenue-sharing model involving distributors, brokers, and sales agents.
4. **Compliance:** Adhering to strict HIPAA standards for data privacy and security.

The Solution

We engineered a multi-application ecosystem hosted on AWS, separating concerns between consumer engagement, business operations, and core data processing.

1. Consumer Web Application

The client-facing portal is a highly responsive Single Page Application (SPA) designed for conversion and speed.

- **Real-Time Aggregation:** Users search for a medication, and our engine queries over a dozen pricing networks simultaneously, ranking results by price and distance.
- **Geolocation & Mapping:** Integrated interactive maps guide users to the exact pharmacy location offering the best deal.
- **Whitelabel Architecture:** The codebase supports environment-based builds, allowing for the deployment of fully branded versions of the platform for specific benefits partners without code duplication.

- **Tech Stack:** React 18, TypeScript, Vite, MobX, Material UI.

2. Enterprise Integrations & SSO

To support the B2B model, we implemented robust Single Sign-On (SSO) capabilities. The system integrates directly with major Human Resources Information Systems (HRIS) and Benefits Administration platforms.

- **Automated Onboarding:** Employees of partner companies can seamlessly access the platform using their existing corporate credentials.
- **Data Synchronization:** Nightly automated jobs synchronize thousands of employee records and eligibility data via secure API connections.

3. Operational Command Center (Back Office)

For platform administration, we developed a powerful dashboard to manage the complex business logic behind the scenes.

- **Revenue Management:** The system automates the calculation of multi-tiered commission structures, tracking claim usage from the pharmacy counter back to the specific partner or agent.
- **Analytics & Reporting:** Administrators have access to real-time data visualization regarding user growth, claim adjudications, and system health.
- **Tech Stack:** Vue 3, Vuestic UI, Tailwind CSS, Chart.js.

Technical Architecture & Security

The backbone of the platform is a robust API designed for high availability and security.

- **Backend:** Node.js API utilizing a type-safe ORM for database interactions.
- **Performance:** Aggressive caching via Redis ensures that high-traffic loads do not degrade the search experience.
- **Infrastructure:** Deployed on **AWS** in a fully **HIPAA-compliant** configuration. All data in transit and at rest is encrypted, utilizing enterprise-grade identity management and rigorous rate-limiting to protect against abuse.
- **Automated Logistics:** Background processes handle the heavy lifting of reconciling pharmacy claim files via secure SFTP.

Technology Summary

Component	Technologies
Marketing Site	WordPress CMS
Consumer Web App	React, TypeScript, MobX, Material UI
Admin Back Office	Vue 3, Vuestic UI, Tailwind CSS, Chart.js
Backend API	Node.js, Express, Prisma ORM
Database & Cache	MySQL, Redis
Infrastructure	AWS (HIPAA Compliant), Docker, PM2

Result

The platform successfully bridges the gap between complex pharmacy benefit networks and the average consumer. It now processes thousands of searches daily, handles automated employee onboarding for major corporate partners, and provides a secure, intuitive, and beautiful interface for users to compare and lower their healthcare costs.

Source URL:<https://www.codebru.com/prescription-cost-comparison-platform>