MarkLogic Provides Access to Healthcare Insurance for Millions of Americans

More Than Eight Million Applications Processed on Healthcare.gov

HealthCare.gov

CUSTOMER:
The US Department of Health and Human Services (HHS) Centers for Medicare and Medicaid Services (CMS)

INDUSTRY:
Government

CHALLENGES:
Data complexity and changing fast;
No set specifications;
Compressed timeline;
Multiple data sources

CUSTOMER USE CASE:
Data consolidation,
Master data management,
Content management and delivery

BENEFITS:
Schema-agnostic database model,
High performance, Scalability;
Enterprise configuration:
  Security
  ACID transactions
  High Availability
  Disaster Recovery

OVERVIEW

Following the approval of the Affordable Care Act of 2010, the US Department of Health and Human Services (HHS) Centers for Medicare and Medicaid Services (CMS) needed to design, build, and implement a technology platform capable of enrolling millions of Americans in new healthcare plans. CMS's driving vision was to enable better access to healthcare for all Americans through smart and efficient tools and systems that would also help reduce costs.

CHALLENGES

CMS had to develop a Health Insurance Marketplace (HIM) and Data Services Hub (DSH) that would allow millions of Americans to shop for insurance, check their eligibility against dozens of federal and commercial data sources, and provide a way for state health exchanges to connect. This was the first time the US government would tackle an IT project of this kind. CMS had to overcome some daunting challenges:

Strict time constraints. CMS was mandated by ACA to launch on October 1, 2013.

Stringent security requirements. Whatever solution CMS chose, it would have to provide the transactional consistency, reliability, disaster recovery, security, and auditing capabilities required for the federal government.

Multiple data sources. The system would need to take in a vast array of data from states, health plan providers, and government entities to evaluate applicants' eligibility status, including the Department of Homeland Security; the Internal Revenue Service; the Social Security Administration; and Veterans Affairs.

An unknown data specification. As with most large-scale implementations, when development started, the data specification was not yet determined. There were numerous changing factors driven by insurance providers and participating states. The database needed to be able to handle constant change and a schema that could evolve.

Scalability. From the outset, CMS knew the marketplace would serve individuals from as many as 51 jurisdictions (the states plus Washington, D.C.). CMS needed a technology that could scale rapidly, on cost-effective commodity hardware, to meet any level of demand.

MarkLogic®

THE SOLUTION

CMS concluded that the MarkLogic Enterprise NoSQL database platform provided the scalability and agility required to meet an 18-month timeframe from software procurement to launch. The teams working on this initiative realized the effort to complete this project would take too long using a traditional relational database.

MarkLogic's schema-agnostic data model ingests data as-is and adapts to modifications, as new data sources are included and as policies or regulations change, to help meet tight deadlines.

MarkLogic was the only platform able to process massive amounts of poly-schematic information while simultaneously offering ACID-compliant transactions.

WHY MARKLOGIC?

Faster time to production. MarkLogic helped CMS get the Healthcare.gov site running within 18 months. In less than 5 months after the website launched, MarkLogic supported 5,500+ transactions per second (TPS-back-end transactions to database) to help over 8 million people sign up for health insurance.

Nearly limitless scalability with record-breaking performance. MarkLogic has supported 160,000 concurrent users and delivered over 99.9% availability. More than 99.99% of queries have logged response times of less than 0.1 seconds, without any data loss or data inconsistencies.

A seamless online shopping experience for Healthcare.gov users. MarkLogic's schema-agnostic data model provided CMS the ability to manage and integrate data "as is" so data from multiple states, government agencies, health plan providers, and personal information from millions of Americans did not have to be recoded. This allowed the system to qualify Americans and provide them competitive healthcare coverage and options.

Confidence to manage and integrate confidential user information. MarkLogic's enterprise-grade NoSQL database platform meant CMS did not have to sacrifice any of the enterprise features expected from a traditional database, such as government-grade security, ACID transactions, and HA/DR, and could take full advantage of a NoSQL schema-agnostic document model that handled the heterogeneous and unstructured data.