

Title

Washington Health Benefit Exchange to the cloud and beyond: A journey of innovation and transformation

Category

Enterprise IT Management Initiatives

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Executive Summary

The Washington Health Benefit Exchange (Exchange) is a national leader in helping provide quality, affordable health insurance coverage to more than 1.8 million Washington state residents. Established in 2011 in response to the passage of the Affordable Care Act, the Exchange operates the *Washington Healthplanfinder*, a robust, innovative platform that enables individuals and families to browse, compare and enroll in health and dental plans. The state-based exchange works closely with the state Health Care Authority, Office of the Insurance Commissioner, and Department of Social and Health Services (as well as private insurers and provider directories) to ensure consumers have an informed, seamless experience.

The Exchange decided in 2017 to upgrade its aging, legacy system and move it to the Azure Cloud (*please see [Microsoft's case study](#)*). This allowed the Exchange to adopt and meet industry challenges and provide the flexibility to easily scale up or down while avoiding long-term capital expenses. The Exchange chose Azure Government Cloud as its public cloud option. Working with Deloitte, Microsoft and Oracle, the Exchange reviewed the infrastructure set-up to reduce redundant software and consolidate excess environments. The Exchange also introduced new security measures that adhere to the highest security standards. This was all built on best of breed technology while doing a Waterfall to Agile transformation, which reduces maintenance costs significantly.

The new system provides a modernized platform with future growth in mind including up-to-date operating systems, modularized environment, centrally managed accounts, anti-virus protection, security scanning, central logging, and an upgraded Oracle stack. The overhaul reduced maintenance costs significantly – driving a savings of more than \$2.5 million every five years – with a larger reduction likely after moving to new technologies. In addition to saving money, overall security was significantly improved, and system performance increased 75%.

With the new system in place, 2019 was the first year that Open Enrollment that did not have a major outage due to system failures or hardware failures.

In addition, the successful transition to a cloud infrastructure was critical to the Exchange's response to the COVID-19 pandemic. The loss of employment and employer-sponsored coverage led to a surge in customers seeking alternate health insurance options. The *Washington Healthplanfinder* website observed significant traffic increases which were easily handled with the cloud's increased capacity. In the past, increasing capacity would have required new hardware and taken days. The surge experienced by *Washington Healthplanfinder* was easily handled.

In the future, the Exchange is focused on ambitious innovation initiatives to optimize organizational performance and increase efficiency. These initiatives include modernization through modularity, DevSecOps automation, and Data Warehouse. The Exchange has also identified a set of best practices that enable it to support a complex and dynamic ecosystem of

Federal and State agencies, external vendors, carriers, providers, and individuals. As the marketplace continues to mature, the Exchange will employ these enterprise IT management initiatives to guarantee accessible, affordable, and high-quality health insurance for all Washingtonians.

Description of Business Problems and Solutions

The Exchange was created to manage and operate the *Washington Healthplanfinder*, a state-based marketplace for Washington residents to browse, compare, and enroll in health insurance coverage.

Cloud Migration and Data Security

Originally developed on a three-tier architecture (web, application and data), the *Washington Healthplanfinder* used Oracle SOA products to ensure security and compliance with CMS requirements for MITA (Medicaid IT strategy) compliance. The system was built over 175 servers comprised of environments from development through production, including disaster recovery. Its infrastructure utilized redundant firewall and IDS/IPS devices and Oracle's security stack for highly secure user authentication and authorization. As a health insurance marketplace, it was critical for the system to employ standards to ensure the security of data such as Personally Identifiable Information (PII), Internal Revenue Service (IRS) data and Federal Tax Information (FTI).

As data challenges and market demands grew, however, the Exchange had to reconsider its system architecture. The existing hardware was not scalable and limited the Exchange in storage, compute and capacity.

The Exchange chose to undergo a complete overhaul, transitioning fully to a secure cloud under Microsoft's Azure for Government offering. This represented a complete redesign of the infrastructure that included a full software and framework upgrade that involved collaboration with Deloitte (the Exchange's systems integrator), Microsoft and Oracle. Over the course of 18 months, the Exchange managed the services of these vendors to ensure a seamless and successful migration.

The transition resulted in a fully integrated central backend administrative domain, with all workloads utilizing this central authentication and authorization system. Resulting in upgrading and building 149 servers, on premise VOIP system to 100% cloud solution, micro-segmented network, six new PaaS services, 13 new products, centrally managed access, security scanning, central logging and an upgraded technology stack. Through innovative, industry-leading IT initiatives, the Exchange continues to improve its operating capabilities, revolutionizing how individuals access affordable and reliable health insurance coverage.

Network

The Exchange took ownership of down-managed services and all backend support technologies. This has allowed for higher visibility and the ability to drive security and performance standards. With this transition, the Exchange has significantly reduced its maintenance and upgrade costs. Additionally, by eliminating traditional infrastructure limitations, *Washington Healthplanfinder* can deliver new enhancements to consumers in a faster and more secure fashion. Allowing for a full modernization effort into a more modern modular architecture and streamlined automated delivery starting in July 2020 using cloud native technologies like GitHub, docker, and Kubernetes.

Security was also a top priority for the Exchange as it transitioned *Washington Healthplanfinder's* infrastructure to the cloud. The Azure network was built with a zero-trust policy to eliminate any gaps in system security and ensure users only had access to functions for which they had prior review and approval. With micro-segmentation as framework, and the strategy to encrypt wherever possible, the Exchange has instilled minimal access to the various components in the *Washington Healthplanfinder* Cloud by integrating security directly into the cloud infrastructure. Additionally, the Exchange introduced a Secure Software Development Lifecycle (SSDLC) process that included steps such as an Architecture Board Review (ABR) and threat modeling to protect data integrity and instill consumer confidence. Performance improvements increased, measuring up to four times faster than the previous system.

Significance to the Improvements of the Operation of Government

The Exchange recognizes the importance of serving Washington residents effectively without waste. Not only does the new system remain compliant with all federal and state-level regulations, the Exchange also constantly evaluates options to execute initiatives for better enterprise-wide IT management.

With the migration to Azure Government Cloud, the Exchange has more flexibility to manage and maintain its system infrastructure. Environments (i.e. DEV, TST, TRN) were systematically reviewed to determine which ones could be consolidated or decommissioned. Both hardware and software improvements were made with inbuilt upgrades, so *Washington Healthplanfinder* has the most up-to-date features.

Benefits of the Project (Financial and Non-Financial)

Washington Healthplanfinder provides more than 1.8 million Washington state residents with quality, affordable health insurance coverage and is recognized as one of the nation's top state health insurance exchanges. The Exchange continues to enhance its IT capabilities, which have yielded significant benefits:

- **Transitioned fully to Azure Government Cloud:** Migration to cloud allows the Exchange to be more nimble in addressing the ever-changing demands within the health insurance landscape without requiring significant hardware dependencies. *Washington Healthplanfinder* is the first state-based marketplace to transition to a 100% Government Cloud-based infrastructure that adheres to the highest security standards and is built on the best of breed technology.
- **Strengthened security standards:** A zero-trust policy ensures verification at all points of access to keep sensitive health and personal data safe.
- **Reduced maintenance costs:** An average of 10% Total Cost of Ownership (TCO) cost reduction.
- **Improved open enrollment for insurance customers:** With the new system in place, 2019 was the first year that Open Enrollment that did not have a major outage due to system failures or hardware failures.
- **Future growth:** We are now able to respond better to customer needs. We can modernize into a fully flexible and scalable application without impacting the stability and customer innovations.
- **Optimized infrastructure software and environments:** Review of existing system infrastructure allows the Exchange to manage the number and scale of the environments based on demand. This is important given that the system operates under high volume during the open enrollment period.

Looking forward, the Exchange is focused on additional initiatives to optimize organizational performance and efficiencies. Modularity, software replacement, and consolidation of software are some of the upcoming enhancements planned for *Washington Healthplanfinder*.

The Exchange has identified and optimized a set of best practices and processes enabling it to support a complex and dynamic ecosystem of federal and state agencies, external vendors, carriers, providers, and individuals. As the marketplace continues to mature, the Exchange will employ these enterprise IT management initiatives to provide accessible and affordable high-quality health insurance for all Washingtonians.