Swish and Elastic enable a U.S. Department of Energy National Laboratory to enhance their internal search capabilities with AI

Introduction

This Department of Energy National Laboratory is one of the premier research facilities in the U.S., dedicated to advancing science and technology through cutting-edge research and innovation. They employ teams of people that are at the forefront of advancements in fields such as energy, materials science, computing, and biology. Most importantly this lab advances the science behind our national security, protecting nuclear materials to enable their secure, peaceful use for energy production, medical applications, and scientific discovery worldwide.

The Problem

Limitations in the lab's search capabilities were impeding the ability to conduct thorough literature reviews, stay informed about broad scientific developments, and make well-informed decisions pertaining to research projects. Employees reported that their existing search system was untrustworthy due to subpar speed, relevance, and ease of use. As an alternative, they were manually browsing the A-Z index for what they needed which meant that they were unable to consistently locate all necessary and available information.

Because of technological advances and improvements to search methods, the speed of information retrieval and the breadth and depth of searches at the lab were falling short of expectations. They needed to optimize their enterprise search capabilities to foster a self-service culture based in trust and quality outcomes.

Additional National Laboratory Challenges

- **Limited search accuracy**
- **Inefficient retrieval**
- **Insufficient UI/UX**
- **Comprehensive database access**

> **"We don't even use the search function today. Instead, we use the A-Z index because it's more reliable."**
>
> -HR Onboarding Staff

Solutions

Swish was awarded a contract to implement Elastic's Elasticsearch and develop a customized, enhanced web UI/UX with Vector search, Machine Learning pipelines and Generative AI answers for user queries. Elasticsearch's limitless ingestion, vector database with transformer models, and retrieval augmented generation (RAG) capabilities, coupled with generative AI integrations, provide the laboratory with a powerful capability to significantly enhance their internal search capabilities. This new Intelligent Search application connects users to the Elasticsearch engine, improving the search interface in the key areas of contextual relevancy, speed, and user experience. This innovative enhancement also yields important search analytics and search feedback components that are used to continually improve search results.

Results

Using Swish services and Elastic's powerful search capabilities, the lab was able to empower users with greater insights, improved cross-project data sharing, and overall elevated user satisfaction and productivity. The amount of time it takes to find information was significantly decreased. Users regained trust in their search results and were able to make more informed decisions. Onboarding for new personnel was also greatly simplified with a question-based generative AI platform that enables them to ask a question and get a contextually accurate answer.

Summary

DoE National Laboratories are dedicated to advancing science and technology through cutting-edge research and innovation. The ability to ask questions and get contextually relevant and trustworthy answers is critical to this lab's success. However, they were facing obstacles with search that left them unable to efficiently access scientific databases, trust the accuracy of the data, and conduct searches with the required speed. In addition, they continued to suffer from a very low user experience satisfaction rating. Swish developed a new Intelligent Search capability leveraging Elasticsearch while integrating a near real-time generative AI search experience and analytics for all types of data; structured, unstructured, numerical, and more. The increased search speed provided confidence in search accuracy, expanded search capacity and greatly improved employee insights and morale.

About Swish

Swish is a provider of technology solutions and engineering services to the U.S. Federal Government with a focus on high-quality outcomes for customers. Since 2006, Swish has delivered high-performance solutions and services to the Federal Government market ensuring that customer's digital service capabilities, performance, and security exceed expectations and requirements. Swish is a Service-Disabled, Veteran-Owned and HUBZone certified Small Business.

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