

CASE STUDY



Costco



PROJECT

Vertex AI Search for Retail Integration Case Study

OVERVIEW

Improving was engaged by Costco, the third largest retailer in the world, to enhance their e-commerce search functionality using Google's Vertex AI Search for Retail. The project aimed to replace Costco's existing search system with a more advanced, revenue-optimized solution. The partnership between Improving, Google, and Costco focused on integrating the Vertex AI technology into Costco's online ecosystem, ensuring scalability and better search relevance. The project covered key phases including technical discovery, solution design, implementation, and testing, resulting in a robust search solution poised for future growth.

BUSINESS PROBLEM

Costco faced significant challenges with their existing search system, provided by Lucidworks. The system was not optimized for revenue and lacked personalization capabilities, leading to suboptimal search results. Additionally, the cost of maintaining the Lucidworks solution was high, and it did not meet Costco's performance expectations. With a growing e-commerce presence, Costco needed a search solution that could deliver better relevance, optimize for revenue, and scale with their expanding online operations.

OUR APPROACH

Improving's approach involved a thorough technical discovery phase to understand the specific requirements and limitations of Costco's existing system. We then collaborated with Google to design and implement a solution that integrated Vertex AI Search for Retail into Costco's e-commerce platform. This included developing a search application that acted as a facade for the Google search technology, ensuring seamless integration with Costco's existing infrastructure. Our team focused on creating a scalable and adaptable solution, allowing for future growth and potential provider changes.

BUSINESS BENEFITS

- **Improved Search Relevance:** Enhanced search result quality by leveraging Google's AI technology.
- **Revenue Optimization:** Implemented search personalization to optimize for revenue based on user behavior.
- **Cost Savings:** Replaced the expensive Lucidworks solution with a more cost-effective Google Vertex AI system.
- **Scalability:** Developed a solution that scales with Costco's growing e-commerce operations.
- **Integration Flexibility:** Designed the system to support potential future changes in search technology providers.
- **Enhanced User Experience:** Provided a more intuitive and efficient search experience for Costco's customers.

TECHNOLOGIES AND METHODOLOGIES USED

- **Google Vertex AI Search for Retail:** Core search technology.
- **Google Kubernetes Engine (GKE):** Container orchestration for scalable applications.
- **Cloud Run:** Managed serverless environment for deploying applications.
- **Dataflow:** Real-time data processing and transformation pipelines.
- **Firestore:** Multi-region NoSQL database for scalable storage.
- **Redis Cloud:** In-memory data structure store for caching.
- **Google Pub/Sub:** Messaging service for event-driven systems.
- **Google Cloud Scheduler:** Schedule jobs to run at defined times or intervals.
- **Terraform:** Infrastructure as code for deployment automation.
- **Java, Python, JavaScript:** Programming languages used for application development.
- **Playwright, JMeter:** Tools for functional and performance testing.

PARTNERSHIPS

The project was a collaborative effort between Improving, Costco, and Google. Google played a crucial role in providing the Vertex AI technology and supporting the backend integration. Costco's global e-commerce division, IT executives, cloud team, IT security team, and other stakeholders worked closely with Improving to ensure the solution met their requirements and aligned with their technology direction. This partnership was essential for addressing the specific needs of Costco's diverse and expansive e-commerce operations.

CASE STUDY



LESSONS LEARNED

1. **Early Integration:** Integrating systems early in the project lifecycle helps identify and resolve issues sooner, improving overall project outcomes.
2. **Coordination Between Teams:** Effective communication and alignment of expectations between multiple teams and partners are crucial for project success.
3. **Follow Best Practices:** Adhering to best practices provided by subject matter experts ensures optimal use of technology and avoids potential pitfalls.
4. **Transparent Project Logging:** Maintaining detailed project logs with evidence of changes and approvals ensures transparency and accountability.
5. **Adaptability to Changes:** Allowing ample discovery and investigation time for architectural changes helps manage impacts on milestones and budgets.
6. **Stakeholder Identification:** Identifying all relevant stakeholders early in the project can prevent mid-project requirement changes and associated challenges.

CONCLUSION

This case study highlights Improving's ability to deliver a scalable, cost-effective, and revenue-optimized search solution for Costco using Google Vertex AI Search for Retail. Our collaborative approach, technical expertise, and adherence to industry best practices ensured a seamless integration with Costco's e-commerce platform. This project underscores our unique advantage in blending advanced AI technologies with practical, scalable solutions that drive business growth and enhance user experiences.