elastic | LG CNS

SUCCESS STORY

LG CNS implements Elasticsearch hybrid, vector, and generative AI capabilities to improve accuracy and reduce data retrieval times

Region
South Korea

Industry
Software and Technology

Solution
Elasticsearch

Achieved 95% search relevance with hybrid search

- Significant improvement in search accuracy, increasing from 75% with full-text search alone to 95% using hybrid search.

Reduced mass data search time by more than half

- Mass data retrieval time was reduced from 0.2s to 0.1s, with the speed of answer generation improvements through

Improved employee search experience in terms of knowledge management

- LG CNS has advanced its KM model by encoding corporate documents through AI models and indexing in Elasticsearch.

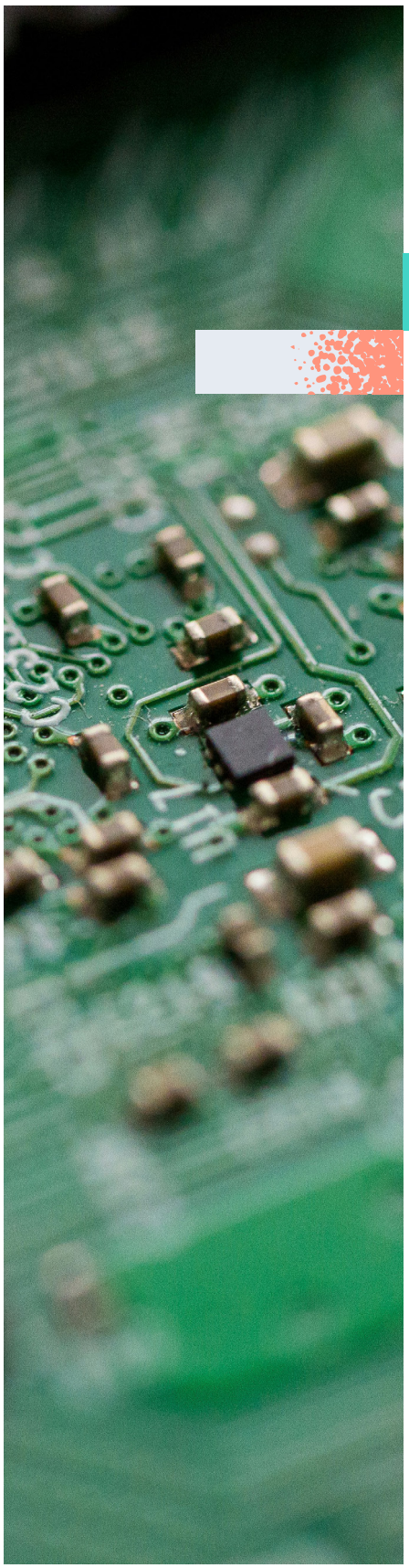
KeyLook AI Algorithm Merges with Elasticsearch to Halve Search Times and Supercharge Knowledge Management

LG CNS is Korea's leading IT services company. Established as a subsidiary of LG Group in 1987, it provides consulting, system integration, network integration, and business-process outsourcing services.

In addition to participating in large-scale public IT infrastructure projects, LG CNS is actively entering the global market through partnerships with development centers and global corporations.

With the advent of generative AI, many companies have introduced related technologies to keep up with these advancements. To address this demand, LG CNS is developing projects with generative AI and providing services to those companies. In particular, its KeyLook AI search algorithm is a retrieval augmented generation (RAG) system being developed at its in-house AI center, LG CNS D&A Lab.

The end goal is to improve the overall search function of KeyLook so that its applications can cover all search-related fields. LG CNS also hopes to achieve its vision of innovation in the knowledge-management (KM) field through its search algorithm. To do this, several obstacles first had to be overcome.



> "Elasticsearch is a platform that provides high-quality services in the search market, and we found it to be a well-designed and reliable solution."

Kim Young-min
LG CNS Language AI Lab Professional

The need to adopt a vector search algorithmic approach

During the deployment of the Retrieval Augmentation Generation (RAG) system, LG CNS needed to address the issue of the existing search algorithm not understanding user intent. This required shifting from keyword-based search algorithms to a context-based vector search method. To improve database search capabilities for storing and performing searches, the research center focused on developing a model to enhance search accuracy and considered introducing external solutions.

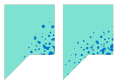
"If a user searched for the term 'blockchain' in Korean, they wouldn't get results for the English search term. This could be solved manually, but required far more man-hours than expected," says Kim Young-min, Communications and Partnership Team Lead at LG CNS D&A Lab.

Achieving 95% search accuracy with hybrid search

LG CNS adopted Elasticsearch to enhance the accuracy and speed of its AI search model. After evaluating various search engine solutions for vector search, Elasticsearch proved to be the most efficient in terms of computing resources and offered the best performance for the KNN algorithm, significantly speeding up vector search. Most importantly, Elasticsearch supported the sparse vector modules that LG CNS required.

"We found that only Elasticsearch supported our semantic-search use cases. The sparse vector search developed during our research showed very good performance, and we wanted a search engine that could be equipped with it," says Kim. "Elasticsearch's sparse vector module allows us to perform searches even when keywords are not exact matches and when they include words with similar meanings or contain typos. The results of adopting Elasticsearch with the help of our partners have been remarkable."

"We tested the Keylook AI model on the KorQuAD 2 data set and combined three modules, including Elasticsearch's full-text search, vector search, and semantic search. As a result, our search accuracy increased by 20%, from 75% to 95%," says Kim. "Sparse vector search enables us to find documents containing synonyms of the search term, while dense vector search focuses on recognizing colloquial sentences and understanding intent. By combining these modules with hybrid search, we significantly improved performance."



> The integration of the KeyLook algorithm with the Elasticsearch platform has been instrumental in enabling us to search and utilize the knowledge we need in a GenAI-powered conversational format."

Kim Young-min
LG CNS Language AI Lab Professional

Reducing mass data search time by more than half

Search improvements go beyond improving accuracy. To process massive amounts of data, you must be able to retrieve the information you want to search for quickly. Initially, LG CNS used data in memory and experienced slow search processing speed and limitations in memory expansion.

Given that Elasticsearch can process large amounts of data at scale, LG CNS incorporated the platform on-premise to improve the search speed of its Keylook AI search algorithm.

“We benefited from the Elasticsearch platform in terms of memory management,” says Kim. “The more data we have, the faster Elasticsearch can process it. With Elasticsearch’s optimization and hybrid support, the time it takes to search 110,000 questions and 10,000 documents in Korean web documents has been reduced by more than half, from 0.2 to 0.1 seconds.”

Improving the employee search experience with knowledge management

Adopting Elasticsearch has also reaped benefits for LG CNS employees.

The Keylook AI algorithm leverages generative-AI models to encode corporate data and index it within Elasticsearch. When a user enters a question on a search site, Keylook AI identifies related documents and delivers answers to ChatGPT. ChatGPT then delivers search results to users by compiling user-friendly, easy-to-understand answers.

Thanks to Elasticsearch’s strong security and indexing capabilities, LG CNS deployed its updated search function and is currently piloting it in the Knowledge Management sector.

Administrators utilize these security features to filter information based on access rights by level and provide search results, improving overall enterprise knowledge search performance.

Unlike traditional full-text search methods, which are bogged down by irrelevant information, Elasticsearch boasts fast search speeds thanks to its inverted index method. This method lets a searcher find documents containing the desired information quickly.

“We were able to evolve our Knowledge Management service business model by encoding corporate documents using AI models and Elasticsearch’s unique reverse-indexing approach, which allows users to quickly find the information they are looking for,” Kim explains.

LG CNS provides comprehensive consulting, system construction and operation services, using expertise earned from large-scale IT project success.

Expanding business into the next-gen KM service industry

While innovating with Elasticsearch, the LG CNS team prioritized user satisfaction and convenience.

Recalling the journey to improve the performance of KeyLook's AI search algorithm, Kim expresses his confidence in Elasticsearch's versatility and support. "We were very satisfied with Elasticsearch," he says. "We saw a good synergy between the various features that Elasticsearch provides through queries and the AI search model that LG CNS focused on. Elastic's aggregation capabilities allow us to process and analyze data in real-time, enabling us to quickly access the latest information, such as the top 10 search terms and queries similar to users' questions. This supports our decision-making process and allows us to respond swiftly."

"We are exploring ways to increase the speed and accuracy of KeyLook AI by leveraging more features supported by Elasticsearch," Kim continues. "Furthermore, LG CNS is expanding its business in next-generation knowledge-management services that transform scattered information into valuable assets."

According to its technology acquisition roadmap, LG CNS plans to provide multilingual technical support in addition to Korean with the KeyLook AI feature and aims to expand its global market for such AI services.

