

# Making smarter connections with Knowledge Graphs

**Dr. Jans Aasman, CEO, Franz Inc. and our AllegroGraph customer, Essilor, were interviewed for this KMWorld Article:**

Graph database technology is among the fastest-growing sectors in the IT industry, with an expected increase of more than 20% per year over the next 5 years, according to MarketsAndMarkets. Just under \$2 billion in 2021, this market is expected to exceed \$5 billion by 2026. The primary factor that will drive this growth is the ability of graph databases to reveal relationships, and their ability to perform near-real-time queries that leverage these relationships. They also can ingest many data types from multiple repositories and use existing taxonomies and ontologies. These capabilities allow them to use existing resources rather than requiring replacement of legacy systems.



Early developers of graph databases included tech giants such as Google, Meta (formerly Facebook), and LinkedIn, which used them for detecting relationships among their users; Amazon and Netflix also used them to power their recommendation engines. Now, graph database technology has become accessible to companies of all sizes for these applications and many others. In addition, significant strides have been made in simplifying the development and use of graph databases.

## **Managing supply chain complexity**

Supply chain management has proved to be a productive application for graph databases. Essilor is a French company that makes ophthalmic products and operates a worldwide

network of production plants, prescription laboratories, and distribution centers. The company supplies corrective lenses, glasses, and sunglasses to opticians and optical chains. It also markets to consumers via online retailers that Essilor owns and/or operates directly.

The portfolio of materials and products required for the manufacture of Essilor's ophthalmic products is complex; the catalogs contain hundreds of thousands of variations of stock and finished lens products offered at more than 500 locations worldwide. In addition, Essilor has fabrication labs and branches in many countries. "To manage the internal supply chain and to control supply risks, we must be able to model complex product configurations in order to have visibility into our supply situation," said Mel Yuson, director of enterprise architecture, Essilor AMERA.

Essilor tried a number of approaches, including third-party solutions, but these were unsuccessful because of the extensive customization required. An in-house system using relational database technology was not able to model the complex relationships of Essilor's extensive product configurations. In a final effort to solve the problem, Essilor decided to develop a semantic knowledge graph based on AllegroGraph from Franz, Inc. A staff engineer at Essilor had seen AllegroGraph at a trade show a few years earlier and recommended that the company explore this option.

The selection of AllegroGraph was based on two major factors. "The most important factor was the maturity of AllegroGraph for production deployment," commented Yuson. "Our first production application was deployed just 9 months after engaging the company." The second factor was the reputation Franz had for providing customer support. "We received excellent consulting help and technical support throughout our development process and after deployment," he added.

Now that the fulfillment system is in place, Essilor can

manage the supply and delivery of each product efficiently. “We have full visibility into our supply chain,” continued Yuson, “and we can understand the impact before a fabrication lab goes down for maintenance, greatly minimizing the risk of order disruption. Timely delivery and order impact predictability risks have been significantly ameliorated with the deployment of our supply chain fulfillment system.”

Essilor is considering other applications for AllegroGraph, including using it to support the company’s pricing system. “Every region has great flexibility in special pricing and promotion,” Yuson explained. “The current pricing system, which is based on relational tables, is very cumbersome to update and change. With Franz’s semantic knowledge graph approach, the pricing system would be much simpler to use, more adaptive to changes, and easier to administer.”

Also on the road map are several projects using AI and machine learning to predict equipment breakdowns, optimize maintenance periods, and improve efficiencies at the fabrication lab. “The idea is to correct any problem before it causes a breakdown that could cause serious supply chain issues,” Yuson concluded.

Graph databases are used to present aggregated data in call centers and to integrate information from hospital systems to make analytics easier. “In many call centers, agents have to open multiple screens to resolve customer issues,” said Jans Aasman, CEO of Franz, Inc., “and they are often able to solve only 60% of the problems the first time, which presents an expensive challenge.” Relational databases generally do not work well because they don’t provide a comprehensive connection with all the data related to a client.

When a knowledge graph is used, the outbound target becomes the core entity of the knowledge graph, and every action is an event object, such as an outbound call or text interaction. “The data is streaming from different databases and is

connected in the knowledge graph for processing to provide a 360-degree view of that target for a streamlined sales process,” said Aasman. “This provides sales agents with all the background knowledge about a customer along with competitive information on a single screen and delivered in real-time—an ideal knowledge-driven sales tool.”

For companies that want to get started with graph databases, the advice Aasman offers is to aim first for the low-hanging fruit. “Pick a high-value project that is supported by data and one for which developing an ontology is feasible,” he advised. Finally, extract data from multiple sources and put it into a knowledge graph so people can get an overview that would not otherwise be available through traditional database architecture in order to demonstrate the value of graph databases.

Data fabric is the next level of maturity for data integration, according to Aasman, and it can make very effective use of knowledge graph technology. “This architecture provides a systematic approach to search a variety of databases for relevant information,” he observed. “It can document every table, column, and description of data; what business line owns the database; and who is responsible for it, as well as what applications are affected if it goes down.”