# Knowledge graphs enhance customer experience through speed and accuracy

**KMWorld's recent article covers AllegroGraph and Franz's customer N3 Solutions.**

The Full Article – KMWorld

Knowledge graphs are a way to model enterprise knowledge and represent complex interrelationships in data. Information stored in a graph database can enable rapid retrieval of well-targeted results and provide insights into customers' interests and needs. Gartner predicts a 100% per-year growth in applications for graph analytics and databases for the next several years. Although knowledge graphs have been deployed by major companies such as Google, Amazon, and LinkedIn due to their ability to incorporate relationships in their analyses as well as their speed, only in the last 5 years has their use become more widespread.

N3 is an outsourced sales company for major organizations that sell complex B2B software, hardware, and tech solutions. It supports businesses in 92 countries, provides services in 25 languages, and holds thousands of hours of conversations every month with customers and prospects. "In today's world of complex products, it takes a well-educated team to tell the story about how this technology can help a company become more competitive," said Shannon Copeland, COO of N3. "The sales team needs to be able to instantly access the information they need to do their job."

## Faster insights

The company has been operating for 16 years, and in the last few years began an initiative to manage its knowledge in a more intentional way. “We generate a great deal of data,” noted Copeland, “and we wanted to make more effective use of it to understand our customers. And because of the speed at which business is transacted now, we needed to get insights right away, not a month later in a report.”

N3 built a data model to reflect the essential data elements and the associations among them and decided that a knowledge graph was the best way to represent the information. After looking into partner options, N3 chose to work with Franz, Inc., which provides a semantic graph database called AllegroGraph. “We decided to work with Franz because of its extensive experience and the fact that it had worked with a variety of industries,” Copeland said.

The system built by N3 allows sales teams to organize signals from the market in a way that allows them to better explain the products to prospective buyers. “We build relationships with tech buyers on behalf of our clients,” continued Copeland. “Our employees are typically college graduates who would like to begin their careers in sales and marketing in tech solutions. They take ownership of their territory and we help them be as sophisticated as a future CMO would be.” The resources supplied by the knowledge graph provide the support the sales team needs to tailor information to each prospective customer.

The specific expertise required by the team varies depending on the products being sold, the geographic region, and other factors, and the knowledge graph supports these needs. For example, if a team in southern Portugal needs to know the preferences of that market, the associations built into the graph database can provide the information that is essential for them. “The information we can access helps customers

understand the answers to their questions very quickly," Copeland commented. "We believe the experience that the customers have helps them scope out what they need and what the road map might be."

The strength of graph databases

A graph databases is a type of NoSQL database that stores data according to associations among data elements rather than in the rows and columns of a relational database. Because graph databases use a dynamic schema rather than a fixed, table-based one, adding new data types and categories is much easier. And because they are semantics-based, graph databases have strengths in inferring intent, producing answers to questions, and making recommendations. They can also make inferences about possible associations from existing associations.

A graph database also provides much more context than a relational database and therefore can return more relevant results when a user is searching; they also integrate data from multiple sources. "At one telecom company we worked with, customer service reps might have [had] to open 15 databases to find out what went wrong and what the solution was," said Jans Aasman, CEO of Franz. "We took their core customer data, billing information, every CRM call, and every action and put them into AllegroGraph, and the customer service reps were finally able to respond in a meaningful way, whether that was to make an offer to the customer or provide appropriate technical support." The capability of graph databases to overcome silos and provide an integrated view of the customer is one of its strengths.

In order to create the graph database on which the knowledge graph is built, the relationships among entities need to be mapped. In the case of a hospital patient, the patient is the core entity, and the events are medical encounters or lab results, which may come out of different databases or a data

warehouse. “The mapping is a major project, but it only needs to be done once,” Aasman pointed out. “After that, the relationships do not need to be regenerated during the search because they are indexed in AllegroGraph, which makes retrieval very rapid.”

---

# AllegroGraph Named to 100 Companies That Matter Most in Data

***Franz Inc. Acknowledged as a Leader for Knowledge Graph Solutions***

**Lafayette, Calif., June 23, 2020 –** Franz Inc., an early innovator in Artificial Intelligence (AI) and leading supplier of Semantic Graph Database technology for Knowledge Graph Solutions, today announced that it has been named to The 100 Companies That Matter in Data by Database Trends and Applications. The annual list reflects the urgency felt among many organizations to provide a timely flow of targeted information. Among the more prominent initiatives is the use of AI and cognitive computing, as well as related capabilities such as machine learning, natural language processing, and text analytics. This list recognizes companies based on their presence, execution, vision and innovation in delivering products and services to the marketplace.

“We’re excited to announce our eighth annual list, as the industry continues to grow and evolve,” remarked Thomas Hogan, Group Publisher at Database Trends and Applications. “Now, more than ever, businesses are looking for ways transform how they operate and deliver value to customers with greater

agility, efficiency and innovation. This list seeks to highlight those companies that have been successful in establishing themselves as unique resources for data professionals and stakeholders."

"We are honored to receive this acknowledgement for our efforts in delivering Enterprise Knowledge Graph Solutions," said Dr. Jans Aasman, CEO, Franz Inc. "In the past year, we have seen demand for Enterprise Knowledge Graphs take off across industries along with recognition from top technology analyst firms that Knowledge Graphs provide the critical foundation for artificial intelligence applications and predictive analytics.

Our recent launch of AllegroGraph 7 with FedShard, a breakthrough that allows infinite data integration to unify all data and siloed knowledge into an Entity-Event Knowledge Graph solution will catalyze Knowledge Graph deployments across the Enterprise."

Gartner recently released a report "How to Build Knowledge Graphs That Enable AI-Driven Enterprise Applications" and have previously stated, "The application of graph processing and graph databases will grow at 100 percent annually through 2022 to continuously accelerate data preparation and enable more complex and adaptive data science." To that end, Gartner named graph analytics as a "Top 10 Data and Analytics Trend" to solve critical business priorities. (*Source: Gartner, Top 10 Data and Analytics Trends, November 5, 2019)*.

"Graph databases and knowledge graphs are now viewed as a must-have by enterprises serious about leveraging AI and predictive analytics within their organization," said Dr. Aasman "We are working with organizations across a broad range of industries to deploy large-scale, high-performance Entity-Event Knowledge Graphs that serve as the foundation for AI-driven applications for personalized medicine, predictive call centers, digital twins for IoT, predictive supply chain

management and domain-specific Q&A applications – just to name a few."

**Forrester Shortlists AllegroGraph**

AllegroGraph was shortlisted in the February 3, 2020 Forrester Now Tech: Graph Data Platforms, Q1 2020 report, which recommends that organizations "Use graph data platforms to accelerate connected-data initiatives." Forrester states, "You can use graph data platforms to become significantly more productive, deliver accurate customer recommendations, and quickly make connections to related data."

**Bloor Research covers AllegroGraph with FedShard**

Bloor Research Analyst, Daniel Howard noted "With the 7.0 release of AllegroGraph, arguably the most compelling new capability is its ability to create what Franz refers to as "Entity-Event Knowledge Graphs" (or EEKGs) via its patented FedShard technology." Mr. Howard goes on to state "Franz clearly considers this a major release for AllegroGraph. Certainly, the introduction of an explicit entity-event graph is not something I've seen before. The newly introduced text to speech capabilities also seem highly promising."

**AllegroGraph Named to KMWorld's 100 Companies That Matter in Knowledge Management**

AllegroGraph was also recently named to KMWorld's 100 Companies That Matter in Knowledge Management. The KMWorld 100 showcases organizations that are advancing their products and capabilities to meet changing requirements in Knowledge Management.

**Franz Knowledge Graph Technology and Services**

Franz's Knowledge Graph Solution includes both technology and services for building industrial strength Entity-Event Knowledge Graphs based on best-of-class tools, products,

knowledge, skills and experience. At the core of the solution is Franz's graph database technology, AllegroGraph with FedShard, which is utilized by dozens of the top F500 companies worldwide and enables businesses to extract sophisticated decision insights and predictive analytics from highly complex, distributed data that cannot be uncovered with conventional databases.

Franz delivers the expertise for designing ontology and taxonomy-based solutions by utilizing standards-based development processes and tools. Franz also offers data integration services from siloed data using W3C industry standard semantics, which can then be continually integrated with information that comes from other data sources. In addition, the Franz data science team provides expertise in custom algorithms to maximize data analytics and uncover hidden knowledge.

---

# Ubiquitous AI Demands A New Type Of Database Sharding

Forbes published the following article by Dr. Jans Aasman, Franz Inc.'s CEO.

The notion of sharding has become increasingly crucial for selecting and optimizing database architectures. In many cases, sharding is a means of horizontally distributing data; if properly implemented, it results in near-infinite scalability. This option

enables database availability for business continuity, allowing organizations to replicate databases among geographic locations. It's equally useful for load balancing, in which computational necessities (like processing) shift between machines to improve IT resource allocation.

However, these use cases fail to actualize sharding's full potential to maximize database performance in today's post-big data landscape. There's an even more powerful form of sharding, called "hybrid sharding," that drastically improves the speed of query results and duly expands the complexity of the questions that can be asked and answered. Hybrid sharding is the ability to combine data that can be partitioned into shards with data that represents knowledge that is usually un-shardable.

This hybrid sharding works particularly well with the knowledge graph phenomenon leveraged by the world's top data-driven companies. Hybrid sharding also creates the enterprise scalability to query scores of internal and external sources for nuanced, detailed results, with responsiveness commensurate to that of the contemporary AI age.

Read the full article at Forbes.

# NEW! – Franz's AllegroGraph 7 Powers First Distributed Semantic Knowledge Graph Solution with Federated-Sharding

***FedShard™, Entity-Event Data Modeling and Browser-based Gruff Drives Infinite Data Integration, Holistic Insights and Complex Reasoning***

Franz Inc., an early innovator in Artificial Intelligence (AI) and leading supplier of Semantic Graph Database technology for Knowledge Graph Solutions, today announced AllegroGraph 7, a breakthrough solution that allows infinite data integration through a patented approach unifying all data and siloed knowledge into an Entity-Event Knowledge Graph solution that can support massive big data analytics. AllegroGraph 7 utilizes unique federated sharding capabilities that drive 360-degree insights and enable complex reasoning across a distributed Knowledge Graph. Hidden connections in data are revealed to AllegroGraph 7 users through a new browser-based version of Gruff, an advanced visualization and graphical query builder.

"Large enterprises have Knowledge Graphs that are so big that no amount of vertical scaling will work," said Jans Aasman, CEO of Franz Inc. "When these organizations want to conduct new big data analytics, it requires a new effort by the IT department to gather semi-usable data for the data scientists, which can cost millions of dollars, waste valuable time and still not provide a holistic data architecture for querying across all data. ETL, Data Lakes and Property Graphs only exacerbate the problem by creating new data silos.

AllegroGraph 7 takes a holistic approach to mixed data, unifying all enterprise data with domain knowledge, including taxonomies, ontologies and industry knowledge – making queries across all data possible, while simplifying and accelerating feature extraction for machine learning."

To support ubiquitous AI, a Knowledge Graph system will have to fuse and integrate data, not just in representation, but in context (ontologies, metadata, domain knowledge, terminology systems), and time (temporal relationships between components of data). The rich functional and contextual integration of multi-modal, predictive modeling and artificial intelligence is what distinguishes AllegroGraph 7 as a modern, scalable, enterprise analytic platform. AllegroGraph 7 is the first big temporal knowledge graph technology that encapsulates a novel entity-event model natively integrated with domain ontologies and metadata, and dynamic ways of setting the analytics lens on all entities in the system (patient, person, devices, transactions, events, and operations) as prime objects that can be the focus of an analytic (AI, ML, DL) process.

AI applications and complex reasoning analytics require information from both databases and knowledge bases that contain domain information, taxonomies and ontologies in order to conduct queries. Some large-scale knowledge bases cannot be sharded because they contain highly interconnected data. AllegroGraph 7 federates any shard with any large-scale knowledge base – providing a novel way to shard knowledge bases without duplicating knowledge bases in every shard. This approach creates a modern analytic system that integrates data in context (ontologies, metadata, domain knowledge, terminology systems) and time (temporal relationships between components of data). The result is a rich functional and contextual integration of data suitable for large scale analytics, predictive modeling, and artificial intelligence.

Financial institutions, healthcare providers, contact centers, manufacturing firms, government agencies and other large

enterprises that use AllegroGraph 7 gain a holistic, future-proofed Knowledge Graph architecture for big data predictive analytics and machine learning across complex knowledge bases.

“AllegroGraph 7’s support of Entity-Event Data Modeling is the most welcome innovation and addition to our arsenal in reimagining healthcare and implementing Precision Medicine,” said Dr. Parsa Mirhaji, Director of Center for Health Data Innovations at the Albert Einstein College of Medicine and Montefiore Health System, NY “Precision Medicine is about moving away from statistical averages and broad-based patterns. It is about connecting many dots, from different contexts and throughout time, to support precision diagnosis and to recommend the precision care that can take into account all the subtle differences and nuisances of individuals and their personal experiences throughout their life. This technology is about saving lives, by leveraging data, context and analytics and is what Franz’s Entity-Event Data Modeling brings to the table.”

Dr. Mirhaji and his team at Montefiore Health System have developed the Patient-centered Analytic Learning Machine (PALM) using these capabilities to provide an enterprise platform for Artificial Intelligence and machine learning in healthcare that can support conversational AI, interpret data from EMR, natural language, and radiological images, all centered around life-time experiences of an individual patient. A single system that unifies all analytics and data from heterogeneous sources to manage appointments and prescriptions, triage patients with potential spinal cancer, respiratory failure, or sepsis, and provide just-in-time recommendations and personalized decision support for clinicians to improve patients’ outcomes.

**Key capabilities in AllegroGraph 7 include:**

**Semantic Entity-Event Data Modeling**

Big Data predictive analytics requires a new data model approach that unifies typical enterprise data with knowledge bases such as taxonomies, ontologies, industry terms and other domain knowledge. The Entity-Event Data Model utilized by AllegroGraph 7 puts core 'entities' such as customers, patients, students or people of interest at the center and then collects several layers of knowledge related to the entity as 'events.' The events represent activities that transpire in a temporal context. Using this novel data model approach, organizations gain a holistic view of customers, patients, students or important entities and the ability to discover deep connections, uncover new patterns and attain explainable results.

**_FedShard_™ Speeds Complex Queries**

Through a patented in-memory federation function, the results from each machine are combined so that the query process appears as if only one database is being accessed, although many different databases and data stores and knowledge bases are actually being accessed and returning results. This unique data federation capability accelerates results for highly complex queries across highly distributed data sets and knowledge bases.

**Large-scale Mixed Data Processing**

The AllegroGraph 7 big data processing system is able to scale massive amounts of domain knowledge data by efficiently associating domain knowledge with partitioned data through shardable graphs on clusters of machines. AllegroGraph 7 efficiently combines partitioned data with domain knowledge through an innovative process that keeps as much of the data in RAM as possible to speed data access and fully utilize the processors of the query servers.

**Browser-based Gruff**

Gruff's powerful query and visualization capabilities are now

available via a web browser and directly integrated in AllegroGraph 7. Gruff is the industry's leading Knowledge Graph visualization tool that dynamically displays visual graphs and related links. Gruff's 'Time Machine' provides users with an important capability to explore temporal connections and see how relationships are created over time. Users can build visual graphs that display the relationships in graph databases, display tables of properties, manage queries, connect to SPARQL Endpoints, and build SPARQL or Prolog queries as visual diagrams. Gruff can be downloaded separately or is included with the AllegroGraph v7 distribution.

**High Performance Big Data Analytics**

AllegroGraph 7 delivers high performance analytics by overcoming data processing issues related to disk versus memory access, uses processor core efficiency and updates domain knowledge databases across partitioned data systems in a highly efficient manner.

Gartner predicts "the application of graph processing and graph DBMSs will grow at 100 percent annually through 2022 to continuously accelerate data preparation and enable more complex and adaptive data science." In addition, Gartner named graph analytics as a "Top 10 Data and Analytics Trend" to solve critical business priorities." (*Source: Gartner, Top 10 Data and Analytics Trends, November 5, 2019)*

**AllegroGraph 7 Availability**

AllegroGraph 7 is immediately available directly from Franz Inc. Visit the AllegroGraph YouTube channel to see AllegroGraph in action.

**Join AllegroGraph 7 Webinar**
Franz Inc. will host a webcast entitled "Scalable Knowledge Graphs Using the New Distributed AllegroGraph 7." Register for the Webinar.

**Knowledge Graph Conference – May 4 – 7, 2020**

Dr. Jans Aasman, CEO, Franz Inc., will be presenting a talk at the Knowledge Graph Conference entitled, "The Knowledge Graph that Listens" on May 7th at 1PM Eastern. Register for the Conference.

**The Knowledge Graph Cookbook**

Released April 22, 2020, this new book directs readers on why and how to build Knowledge Graphs that help enterprises use data to innovate, create value and increase revenue. The book is full of recipes and knowledge on the subject and features an interview with Dr. Jans Aasman, CEO, Franz Inc. in the Expert Opinion section. Get a copy of the book.

---

# Answering the Question Why: Explainable AI

The statistical branch of Artificial Intelligence has enamored organizations across industries, spurred an immense amount of capital dedicated to its technologies, and entranced numerous media outlets for the past couple of years. All of this attention, however, will ultimately prove unwarranted unless organizations, data scientists, and various vendors can answer one simple question: can they provide Explainable AI?

Although the ability to explain the results of Machine Learning models—and produce consistent results from them—has never been easy, a number of emergent techniques have recently appeared to open the proverbial 'black box' rendering these models so difficult to explain.

One of the most useful involves modeling real-world events with the adaptive schema of knowledge graphs and, via Machine Learning, gleaning whether they're related and how frequently they take place together.

When the knowledge graph environment becomes endowed with an additional temporal dimension that organizations can traverse forwards and backwards with dynamic visualizations, they can understand what actually triggered these events, how one affected others, and the critical aspect of causation necessary for Explainable AI.

Read the full article at AIthority.

---

# Improving Data Processes with Knowledge Graphs

**AllegroGraph Thought Leadership Article from Big Data Quarterly**


Knowledge graphs link together data of any variety, structure, or format in business terms via uniform data models. Organizations can then join and traverse all of their data, semantically tagged with unique machine-readable identifiers, making the platform ideal for

intelligent systems, machine learning analytics, interoperability, and an array of other benefits influential for AI applications.

The technology is gaining the attention of research firms and consultancies. In 2018 and 2019, knowledge graphs appeared on Gartner's Hype Cycle for Emerging Technologies, acknowledged for their hearty connections to pertinent data. According to Gartner, "These ecosystems developed as digitalization morphed traditional value chains, enabling more seamless, dynamic connections to a variety of agents and entities across geographies and industries. In the future these will include decentralized autonomous organizations (DAOs), which operate independently of humans and rely on smart contracts."

Download the Full White Paper.

---

# 100 Companies That Matter in Knowledge Management

Franz Inc., is proud to announce that it has been named to The 100 Companies That Matter in Knowledge Management by KMWorld. The annual list reflects the urgency felt among many organizations to provide a timely flow of targeted information. Among the more prominent initiatives is the use of AI and cognitive computing, as well as related capabilities such as machine learning, natural language processing, and text analytics.

"Knowledge management software and services providers are embracing a fresh wave of technological innovation to address heightened expectations—among both customers and employees—for the right information to be delivered to the right people at

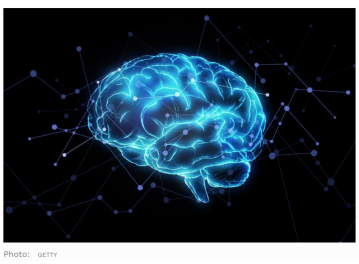
the right time, said Tom Hogan, Group Publisher at KMWorld. “To showcase organizations that are advancing their products and capabilities to meet changing requirements, KMWorld created the annual list of 100 Companies That Matter in Knowledge Management.”

“We are honored to receive this acknowledgement for our efforts in delivering Enterprise Knowledge Graph Solutions,” said Dr. Jans Aasman, CEO, Franz Inc. “In the past year, we have seen demand for Enterprise Knowledge Graphs take off across industries along with recognition from top technology analyst firms that Knowledge Graphs provide the critical foundation for artificial intelligence applications and predictive analytics.  Our AllegroGraph Knowledge Graph Platform Solution offers a unique comprehensive approach for helping companies accelerate the creation of Enterprise Knowledge Graphs that deliver new value to their organization.”

---

# How To Avoid Another AI Winter

Forbes published the following article by Dr. Jans Aasman, Franz Inc.’s CEO.



Although there has been great progress in artificial intelligence (AI) over the past few years, many of us remember the AI winter in the 1990s, which resulted from overinflated promises by developers and unnaturally high expectations from end users. Now, industry insiders, such as Facebook head of

AI Jerome Pesenti, are predicting that AI will soon hit another wall—this time due to the lack of semantic understanding.

“Deep learning and current AI, if you are really honest, has a lot of limitations,” said Pesenti. “We are very, very far from human intelligence, and there are some criticisms that are valid: It can propagate human biases, it’s not easy to explain, it doesn’t have common sense, it’s more on the level of pattern matching than robust semantic understanding.”

Read the full article at Forbes.

---

# California utilities should have used digital twin technology instead of power shutoffs

Northern California’s proactive power outages were not necessary last fall. Digital Twin technology can predict utility line failures and turn off power in milliseconds to avoid the potential of sparks igniting the surrounding area.

Digital twin technologies are gaining traction across industries and use cases. Initially devised as a means of

monitoring assets and production settings in manufacturing, this technology has quietly seeped into other verticals like hospitality, construction, and building management and soon, electricity delivery.

The premier problem digital twins will solve is predicting power grid failure, which would alleviate the social, economic, and political issues that resulted from efforts to reduce the incidence and degree of catastrophes, property loss, and deaths stemming from downstream effects of power grid failure—such as recurring wildfires.

Digital twins can allay these concerns because they're based on real-time signals from a comprehensive set of factors that could be indicative of power grid woes related to environmental, meteorological, or technology concerns. Moreover, they can deliver accurate predictions for each of these factors well in advance of failure—in some cases as much as 28 days.

Read the full article at PowerGrid International.

---

# Franz Inc. to Present at The

# Global Graph Summit and Data Day Texas

Dr. Jans Aasman, CEO, Franz Inc., will be presenting, "Creating Explainable AI with Rules" at the Global Graph Summit, a part of Data Day Texas. The abstract for Dr. Aasman's presentation:


> *"There's a fascinating dichotomy in artificial intelligence between statistics and rules, machine learning and expert systems. Newcomers to artificial intelligence (AI) regard machine learning as innately superior to brittle rules-based systems, while the history of this field reveals both rules and probabilistic learning are integral components of AI. This fact is perhaps nowhere truer than in establishing explainable AI, which is central to the long-term business value of AI front-office use cases."*
>
> *"The fundamental necessity for explainable AI spans regulatory compliance, fairness, transparency, ethics and lack of bias – although this is not a complete list. For example, the effectiveness of counteracting financial crimes and increasing revenues from advanced machine learning predictions in financial services could be greatly enhanced by deploying more accurate deep learning models. But all of this would be arduous to explain to regulators. Translating those results into explainable rules is the basis for more widespread AI deployments producing a more meaningful impact on society."*

The Global Graph Summit is an independently organized vendor-neutral conference,  bringing leaders from every corner of the graph and linked-data community for sessions, workshops, and its well-known before and after parties.  Originally launched in January 2011 as one of the first NoSQL / Big Data conferences, Data Day Texas each year highlights the latest tools, techniques, and projects in the data space, bringing speakers and attendees from around the world to enjoy the hospitality that is uniquely Austin. Since its inception, Data Day Texas has continually been the largest independent data-centric event held within 1000 miles of Texas.