Semantic Research

Connecting the Dots with Ontological Data Models

By Vanishree Bhatt

In the wake of terrorist attacks of 9/11, many businesses, corporations, and government agencies endured significant damage to their operations. This damage exposed the missing elements in the intelligence community that might have helped predict and avert the tragedy beforehand. At that time, analyzing and connecting the dots concealed in the massive volumes of data, stored in disparate and highly protected sources, to develop situational awareness and actionable intelligence was the greatest challenge. One company, Semantic Research, founded in the early 2001, stood out with an innovative solution that has since been used in some of the government’s most critical defense, counter-terror, and cyber intelligence programs. “This was our official entry to the defense and intelligence community, after having established a strong base in the domain of commercial and academic knowledge augmentation,” says Richard Harrison, Founder and CEO, Semantic Research. A sports enthusiast and staunch believer of work ethics that promote productivity, Harrison views businesses as a highly competitive ground and the surest way to withstand the test of times is by staying relevant and driven. With that philosophy and the goal to ‘protect, prevent, and predict,’ Semantic Research has come a long way since its inception. “Our founders, Dr. Kathleen Fisher and Joseph Falleti, who were the early pioneers of semantic networks in Science curriculum development, prototyped a software application called SemNet for both learners and experts,” narrates Harrison. “Our CTO, Chris Staszak had developed data-driven recommendation engines for music listeners at MusicMatch that got acquired by Yahoo.” Combining all these ground-breaking innovations formed the basis of the company’s flagship product - SEMANTICA iDEA™ (intelligent Decision Enterprise Analytics) Platform.

Discovering the ‘Pattern of Life’ by Delving out Data

For over a decade SEMANTICA has been empowering local, state, and federal agencies to save lives, prevent criminal activities and protect critical infrastructure by connecting dots where there seemingly have been none. “The age-old quandary of capturing, accessing, and storing data has been effectively resolved. But, the majority of organizations still face difficulties in interacting with this data and using it to make smarter, quicker, and more valid decisions,” Harrison adds. “You can...
think of SEMANTICA as a context engine, that is, software that allows users to interact with siloes of data, not just within their organization, but with data strewn across external, commercial, and social media data - in context. SEMANTICA easily creates and visualizes these ‘networks of knowledge’ by connecting all data in context through live connectors, federated searches and automated workflows, and allows users to discover “patterns of life.” Examples include understanding geospatial patterns of prescriptions issuance, fulfillment and claims for insurance fraud oversight or conducting background checks to uncover criminal, internal, and cyber threats or pin-pointing key market programs to target customers to provide superior service for a competitive advantage,” extols Harrison.

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Describing the core SEMANTICA platform, Harrison unveils its unique functionalities: “At its core level, we use a semantic network comprised of entities and relationships to map all the data into a graph-based model that shows and describes all the connections between entities.” The platform also includes a suite of visual and computational tools that aids users to construct, analyze, understand, and make effective use of the information in a simple manner. However, the platform does not forego an organization’s or agency’s’ privacy and security policies; rather it accesses only the data required for analysis and delivers only the results that are related to the current problem. The methods employed by this solution avoid data chaos and assist users to confidently take necessary steps by giving them a holistic view of the data that they need to analyze. ‘Many times our customers make comments like, ‘We never understood this pattern before,’ or ‘Now we see what’s going on,’ and ‘we finally feel like we know everything we need to know!”’ beams Harrison.

Inside View of SEMANTICA
To sum it up, the SEMANTICA platform creates a bridge between software and its users by providing contextualization, and hence, better faster, more accurate exploration, analysis, and reporting of data. The SEMANTICA iDEA adds a layer of intelligence to make contextual connections amongst disparate data to unravel answers to the questions and things that users would never know to ask. The latest iterations of SEMANTICA’s two editions—SEMANTICA Pro and SEMANTICA Cortex—have been creating a stir in the market, owing to their unique capabilities. SEMANTICA Pro, a fifth-generation tool, is the desktop fusion, contextualization, exploration, and analysis software that is created for individual analysts. SEMANTICA Cortex is an agile, extensible, server-based platform that delivers discrete components of the iDEA layer to connected users and devices to help them explore and understand data in their organization.

Armed with breakthrough abilities to cater to the new-generation needs of commercial businesses and the intelligence community, Semantic Research’s flexible ontological model is the ideal context engine to fix existing data-use impediments. The company’s SEMANTICA Labs also creates applications inside of their customers’ business environments. This helps customers grasp all the problems in their workflows using custom, flexible ontologies, a way of establishing relationships between entities to bring issues that are important for their business to light.

Semantic Research is a leader in a myriad of programs in the intelligence community and homeland defense wherein both individuals and the entire organization’s analysts have been provided with data integration and relevant analytic tools to track security threats 24/7, around the globe. “In general, we fuse all of their proprietary data with data that they acquire from other agencies and sources to conduct investigations. SEMANTICA creates custom workflows that automate data access and delivers tools to analyze and report on their findings,” said Harrison.

The Road Ahead
With a string of success stories and implementations in the intelligence and the commercial knowledge analysis areas, Semantic Research is focused firmly on the future. Harrison credits Semantic Research’s proprietary, patented data models and processes that are based on real science of human interaction and connections with data access as the company’s primary differentiator. “We do not require massive up-front investments in proprietary data repositories that force organizations to ingest, transform, and replicate all their authoritative databases in a new system before any meaningful work can be done,” expresses Harrison.

Forging ahead, Harrison envisions opportunities beefing up in the commercial sector where the problems and needs are similar to everything they’ve seen in defense and critical intelligence over the years. “We started off with the solutions based on our ‘Protect and Prevent’ philosophies; now, we are set to parlay these strengths to our ‘Predict’ philosophy to help commercial companies,” he concludes.
The present scenario and challenges clouding the defense industry call for an imperative need to modernize outdated legacy IT infrastructures, enabling enterprises to keep up with the rapid pace at which IT is evolving. Since the on-going operations and maintenance costs of legacy systems eat up a major chunk from the budgets of defense organizations, it crowds the ability to innovate and adopt new technologies.

The good news is—global technology disruptions such as mobile operations and advanced analytics coupled with challenging secular industry trends from cloud to automation offer CIO’s the opportunity to lift the IT function to be a true value-creating partner. Leveraging new application and infrastructure delivery models from cloud to Infrastructure as a Service (IaaS) can rapidly deliver new and scalable capabilities. In many situations these delivery models can also offer sustainable run cost reductions when compared to traditional delivery models.

Finally, layered cyber-security through a more integrated and business-back approach is filling a crucial void, given that cyber-security touches every piece of the business from technology, risk, and legal to marketing and operations of the defense sector. Rapid evolution and escalation of threat environment creates need for a step-change in cyber resiliency that engages IT and business stakeholders.

In order to simplify and assist CIOs identify the right defense technology solution providers, CIOReview presents “20 Most Promising Defense Solution Providers 2015.”

A distinguished panel comprising CEOs, CIOs, VCs, analysts, and the CIOReview editorial board has selected the top Defense Technology Solution Providers. In our selection process, we looked at the vendor’s capability to fulfill the need for cost-effective and flexible solutions that add value to the Defense landscape.

**Semantic Research Inc.**

**Company:** Semantic Research Inc.

**Key Person:** Richard Harrison, Founder & CEO

**Description:** A provider of software product that is entirely based on semantic networks as a model for mapping the rich interconnectedness of all entities

**Website:** www.semanticresearch.com