

**A Vendor Deep-Dive from the
Upcoming Report on *Semantic
Search Technologies***

Expert System

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by Lynda Moulton, Senior Analyst and
Consultant



THE GILBANE GROUP

A Division of Outsell, Inc.

Gilbane Group
A Division of Outsell, Inc.

763 Massachusetts Avenue
Cambridge, MA 02139 USA

Tel: 617.497.9443

Fax: 617.497.5256

info@gilbane.com

<http://gilbane.com>

Expert System



Representative Customer Insights

The Cogito platform has enabled us to speed up our competitive intelligence filtering processes to capture “weak signals” that indicate an impending change in our marketplace. These present opportunities for us to move quickly and adjust our business strategy before the competition.

We selected Expert System because we already knew that we wanted, true semantic technology and not just text analysis with statistical inferencing.

History

Expert System builds its semantic net product, **Cogito**[®], on 20+ years of experience with linguistic technology. In fact, their roots reflect a foundation built on providing “spell checkers” for Microsoft Office. The relationship continues; they are the only Italian software house that is a [Microsoft partner](#). In 2007, when Expert System announced Cogito SIMS (semantic intelligent management system for partners and OEMs), their legacy of engineering and development in language technology was paying off for the privately held and consistently profitable firm. At the end of 2009 they were able to announce revenues of +10M Euro, 100+ employees, and 27% EBITDA, a 44% annual growth.

Cogito core technology is based on a *semantic net*, Expert System’s *Sensigrafo*[®], a graphic knowledge representation of language. It is optimized for automated language processing. Currently, Expert System offers support for the Cogito semantic network of 350,000 words and 2.8 mil relationships. This core network includes all words in English and relationships among them. Similar semantic networks are available for Italian, German, French, and Arabic. Expert System estimates that about 75% of the knowledge concepts in its English semantic net have equal representations in other languages and the other 25% have been carefully considered and added for each language to capture the nuances. Several hundred people over the years have contributed and continue to contribute to Cogito’s knowledge concepts and language relationships.

Expert System has expanded its reach into over a dozen vertical markets where its rapid (weeks) deployment model, adaptability for ingesting industry and enterprise specific vocabularies, and out-of-the-box linguistic analysis capabilities help speed application implementation for clients. They aim to cut the installation and implementation time from a year or more and a dozen people to implement down to months or even a few weeks. Expert System has taken the approach that applying statistics and heuristic rules

to solve similar semantic problems is not as efficient as using human linguistic processing with ontologies.

As noted in the “Offerings” section, the Cogito product line is packaged for a diverse range of semantic challenges. This is noteworthy because of the scope and complexity of semantic problems to be tackled and the desire of most enterprises to take on each one in a logical business sequence. Expert System has demonstrated its business savvy in recognizing the way enterprises need to operate by leveraging its rich linguistic framework, and packaging Cogito uniquely for each semantic application. Applying semantic tools in small bites is smart and logical from a business perspective.

Expert System is making serious inroads in energy, homeland security, electronics, telecommunications, automotive, finance, media, and life sciences industries. Customers see significant improvement in the semantic relevance of retrieved content using Expert System’s tools and professional linguistic services for enriching their out-of-the-box semantic net with domain specific terminology.

Expert System offers targeted solutions for: categorization and classification of documents, sentiment analysis, entity extraction and facet creation, disambiguation, and NLP intelligent self-help queries. These solutions are designed to contribute semantic intelligence throughout an enterprise depending on function and business case. Customer services, competitive intelligence and faster categorization of large quantities of unstructured content for research and professional internal use each benefit from Cogito point solutions.

Expert System has been achieving awards and market positioning since 2007. Here are a few on the list: Gartner - Information Access Magic Quadrant - [2009](#), 2007; Search Engine Watch Awards, [Most Innovation New Search Engine - 2009](#); Codie Awards, [Best Enterprise Search](#) - 2009

Descriptions of the Offerings

Expert System engages the marketplace with a steady program of pre-packaged applications to meet individual enterprise semantic challenges. Some find widespread adoption in specific industries and others apply to business functions in all verticals. The following characterizes individual use cases for each product:

[Cogito Semantic Search](#) is for generalized enterprise search across a broad general spectrum of content repositories. This search engine goes beyond traditional keyword search engines by leveraging Cogito’s semantic net to find meaning-based concepts. Where content repositories are large and lack adequate metadata, Cogito has both relevancy and performance advantages over traditional enterprise search engines.

[Cogito Categorizer](#) supports the organization and classification of corpuses of content that exceed what humans can realistically tag. The Categorizer can be customized to include concepts and entities unique to a particular domain. Enterprises can apply internal vocabularies or thesauri, particularly in heavy research environments such as life sciences. [NOTE: See also how the Discover tool adds value.]

Cogito Discover brings a package solution to enterprises with large quantities of un-governed structured or unstructured content. Using its advanced linguistic framework, Discover extracts, transforms irregular language across data stores, tags documents, de-duplicates and normalizes content to place it into a semantically uniform framework or database. It is ideal for merging and integrating databases in similar domains that have been built and maintained separately. After being appropriately tagged, content can be fed to the **Categorizer** or other applications for further analysis and tagged for more accurate retrieval.

Cogito Monitor is ideal for tracking and quickly viewing, in clear displays, the sentiment or tone of discussion about a company, product or an industry. By applying **Monitor** across public web sites, and feeds of social sites, enterprises will immediately detect opinions and weak signals of trends that affect them directly or suggest the need for strategic action.

Cogito Focus brings Web content together with enterprise content to improve the reach of a query. The product enables retrieving external and internal information and bringing results into a common view to **correlate and analyze the information in a unified context**. It also supports the integration of Web definitions to “train” a semantic net to refine search results based on the meanings intended by the enterprise. The visualization features and ability to create new facets “on-the-fly” promote highly dynamic interactions with the content and facilitate exploration of data. Recently, Focus has adopted the **IPTC** (International Press Telecommunications Council) classification scheme to include its ontology of categories.

Cogito Answers is an application using natural language processing (NLP) to deliver customer service activities via the Web, mobile devices or through email. **Answers** is designed to integrate Cogito’s linguistics technology and semantic net with a knowledge base of unstructured content that contains the answers. Then it can correctly interpret questions asked in plain English.

Cogito Intelligence Platform combines text mining for extraction into data bases, semantic analysis for multilingual content, detection of weak signals, automatic classification and correlation across disparate repositories, with advanced visualization tools. The target market is government agencies and competitive industries needing **intelligence processing** from incoming feeds and external repositories.

Cogito SIMS *Semantic Intelligence Management System* is the first advanced linguistic Software Development Kit (SDK) specifically designed to develop applications to find, organize, select and correlate with accuracy a high level of quality unstructured data coming from different sources. SIMS’ ability to effectively understand the meaning of terms using Cogito’s semantic net streamlines the development of semantic applications that need to increase relevancy in retrieval of unstructured text. It is also a stepping stone to building applications to normalize and automatically enhance metadata - named entities, relations, and events related data trapped in a document.

SIMS SDK is directed to OEM customers and system integrators. It includes a declarative language and intuitive user interfaces to enable programmers who do not

possess extensive computational or linguistic experience to develop advanced search, categorization and text analysis applications

Strengths

Expert System is an Italian company and that presented challenges for gaining product traction in the English-speaking world. As already noted, the company is approaching two decades of experience in this language domain through their linguistic support for Microsoft products. But embedded software tools, even those with millions of installations have a stretch to build commercial recognition among direct buyers.

After this lengthy tenure as a Microsoft OEM, Expert System launched a systematic program of product releases, beginning in 2007, coupled with new management presence in the UK and US and began their steady growth in markets outside Italy. Readers can see for themselves the record of activity by viewing their Press Release [archives](#), not so much for the marketing messages, but as evidence of strategic awareness and action.

There are five specific areas in which Expert System clearly demonstrates market understanding and responsiveness:

Packaging – Semantic technologies are complex to explain and sell to business buyers. Taking individual business cases that they know their Cogito platform and semantic net can solve, Expert System has wrapped solutions into individual applications that speak to business challenges. It already has public stories to tell about every application.

Business Use Cases – Cogito products address business cases that have been prominently featured in the industry literature as appropriate applications of semantic technology. Over the past decade or two those challenges have been tackled by the largest enterprises with tools that require purchasing high priced software licenses, plus services to implement over months or years. This approach doubles or triples the original license cost. Taking a direct approach to [each application](#) and establishing reasonable paths to evaluation, testing, procurement and quick implementation, Expert System places its products in a highly competitive position for even SMBs.

Customizable and Compact Semantic Net – Cogito's core semantic net, Sensigrafo, provides a comprehensive vocabulary with a small footprint (~50 MB), which can be built up using any industry or domain specific terminology.

User Interfaces – Semantic applications require tuning and administration. Cogito products are delivered to be used in real world environments in which subject, text analytics, and linguistic experts can apply their knowledge to curation and customizing the semantic net.

Quick Installation – Four to eight weeks is typical for implementing and testing a new corpus of content. Typical semantic speeds are in the order of 120KB/sec with a standard quadcore CPU.

Efficiency Gained for Teams – Deployment and tuning is usually performed by professional linguists, language engineers and programmers. An implementation is easily supported by a team of two to four. Expect that internal terminology experts groups of up to 15 people before installation can usually be reduced to one or two.

Hosted Services for Applications – Monitor, Focus and Answers can also be offered as hosted solutions to address the growing needs for some functions in the enterprise (i.e. Marketing, Customer Care etc.) to minimize the hassle to develop and support the architecture required to run the applications.

Problems Solved

Expert System's products offer tools for all fundamental semantic problems:

- Natural language search
- Text mining and analysis
- Sentiment analysis
- Disambiguation of terminology in context
- Auto-categorization

An implementation of the Cogito Semantic Search Engine after installation might begin with this training process for a new corpus. This is an iterative process, making adjustments to improve semantic understanding in a specialized domain. Expert System offers services to perform the operations, or the enterprise experts can do it themselves.

Here are several examples of Cogito solutions applied:

RCS, the leading publishing company in Italy with businesses in press, book, news, and multi-media, uses the Categorizer to manage feeds of hundreds of articles each day. Two principal benefits are higher accuracy classifying articles and the ability to perpetually process content, 24X7X365. The Categorizer worked so reliably that RCS merged categorization output (subjects, places, people, and company entity names) with its editing system to provide a normalizing and checking function across their content. RCS has reduced operating costs, while improving quality and consistency across content.

Cogito Monitor, which was deployed for the auto industry to monitor sentiment by scanning blog feeds, is used by **Honda** and **Pirelli**. It looks for information about customers' attitudes and product problems to aid product managers, dealers, manufacturer, and consumers.

Expert System has built up its Cogito customer base in Europe and has a significant presence in that market. They are aggressively growing their North American customer base from which new case studies will begin to appear. In the meantime, by visiting the product [market](#) and [customer](#) pages on their Web site the reader will get a sense of the variety of vertical markets using Cogito in Europe.

Strategic Advantages and Competitive Positioning

Expert System has the linguistic depth with its semantic nets to compete in multiple languages, which gives them coverage in most of Europe and the Middle East. As well, they have demonstrated competency in competitive vertical markets.

They have lengthy and deep experience with semantic analysis. This means understanding the four cornerstones of semantics: morphology, grammar, logic and meaning.

Sensigrafo, Expert System's semantic net, embodies some unique features that allow superior semantic analysis and disambiguation of text supporting deep text analysis, and high performance (accuracy and speed). Unique features include:

- Expanded definition of lemmas (base form of a words) including all synonymy, and semantic relations
- Categories of attributes
- Differentiated domains of usage
- Differentiated sets of attributes
- Small footprint, 50MB of memory

Each node in the semantic network has a unique ID and a proprietary way to access the data to speed performance and support in memory processing

The company offers its own ETL (extraction, transforming, loading), converters, crawlers and integration points with popular programs such as Microsoft FAST, SharePoint etc. to ease the use of semantic tools with existing IT investments. Expert System also integrates with many 3rd-party ETL tools.

Expert System Semantic retrieval will return all documents that explicitly match an NLP request, and leverages the entire semantic net framework to include content containing concepts that are semantically synonymous.

Expert System native database retrieval includes MSQL and integrates with other DB technologies (e.g. Oracle 11g, Franz AllegroGraph).

Futures

Having established a presence in many of the largest multi-national corporations in information intensive industries (e.g. ENI – energy; Honda – automotive; Homeland Security – government), Expert System has opened opportunities for expansion in each organization and vertical market. Once an enterprise has committed to semantic software for solving difficult search and discovery problems, it has begun the process of understanding:

- What types of questions can be answered
- How to formulate queries
- Practices for improving and maintaining a domain enhanced semantic net

- The expertise resources that are most suited to implementation and ongoing usage

Expert System should be able to benefit from its approach of developing a suite of products, each of which has different positioning in an enterprise. This will make inside selling to existing customers a natural progression.

Recent investment in product marketing and presentations across industries, including major information technology conferences have brought the Expert System story to every region of North America. They are consistently present and aggressively gaining a toe-hold outside of Europe.

Partnerships with Expert System are an opening for others in the semantics industry; their long experience with Microsoft shows that they can bring significant linguistic technology value to even the largest software companies. They have strengths that are “embeddable” and will be sought after on that front.

Consultancies and system integrators seeking search solutions at a reasonable price point will be an area that Expert System can exploit. Capgemini and Avande are two such partners. Others that make a serious commitment to supporting the products will have a springboard for multiple specialized opportunities that would not otherwise be possible.

Customer Testimonials

For us, using Cogito Answers, the NLP query option for our mobile devices is huge boost to our support efficiency. Average relevance to our customers for a question they pose is 93% and we save double-digit dollars for every query processed successfully that does not go to a service person.

We are trying to learn everything we can about our marketplace, competitors and customers. The (Cogito) knowledge extraction tools are excellent for finding information that is important to us, and that goes into a database for further analysis.

Two of the questions Cogito helps us answer are “Who are we doing business with?” and “What do we know about them?” This helps us in sourcing, contracting and re-selling within an organization.

With Cogito, we are able to add our own unique concepts to the semantic net, as needed, and then use the linguistic processing to help us normalize a lot of very unstructured content.

We have very aggressive schedules for proving the precision of the retrieval; with several testers trying to find problem areas, we really appreciate Expert System’s flexibility and accommodation to help us with the process.

Corporate Facts

Corporate Headquarters

Via Virgilio, 56/Q - Staircase 5, 41123 Modena - Italy

Phone: +39 059 894011

Fax: +39 059 894099

info@expertsystem.net

Sales and Support contact info:

United Kingdom

Office: +44 (0) 1590 612855

USA

Expert System US

J. Brooke Aker

Office: +1 860 728-8000

Mobile: +1 860 614-2411

baker@expertsystem.net

twitter.com/brookeaker

Officers: Marco Varone (Founder, CTO and President), Stefano Spaggiari (Founder and CEO), Andrea Melegari (Partner and Vice President Intelligence Division), Marcello Pellacani (Partner and Vice President Corporate Division), Luca Scagliarini (Partner and Vice President Strategy and Business Development), J. Brooke Aker (CEO of the US subsidiary)

Employees: 100+

Pricing: Pricing is done on a traditional software licensing model with recurring maintenance and support in the following years. Prices are calculated by server capacity and customer requirements (e.g. simple categorization is a lighter load on the server than a full semantic markup of every document). Cogito can handle 60-100 thousand documents per day for an average server. Starting points for the license model are less than \$100k. A SaaS model is also available using hosted and cloud computing infrastructures. The SaaS model is less expensive up front but will be roughly equal to the licensing model within 5 years.

Status: Privately Held