

white paper

---

# Putting Semantics to Work in Financial Services

*A white paper brought to you by Expert System and Recognos Financial, in association with SemanticWeb.com.*



*Copyright 2011  
All rights reserved.*

## **Introduction**

The financial sector has its own set of special needs when it comes to managing data and information. Driven by large amounts of information, the need for quick access to data, privately and securely, financial institutions need to be able to make decisions quickly, to allocate resources and most of all, to please customers and maximize shareholder value.

Semantic technology can apply the same standards inside the organization to not only make data and information easy to find and share, but also extend the technology to help better manage relationships with customers and take advantage of the valuable information about the company available outside the firewall. Semantic intelligence is able to find and identify information that allows financial institutions to minimize their exposure to risks, and it provides early identification and analysis of consumer sentiment, market trends and competitor information—and it uncovers this data not only from within an organization's network, but also from the most unstructured corners of the Web.

## **Why Semantic Technology Matters**

Semantic technology has the ability to intelligently manage a knowledge base, to integrate information and data, to update and grow intellectual capital and ensure organizations can find the information necessary to make decisions.

Semantic technology understands the real meaning of words based on theories of human comprehension—the way humans do. It allows for the automatic comprehension of words, sentences, paragraphs, and entire documents, and is able to understand the meanings of words expressed in their proper context, no matter the number (singular or plural), gender, verb tense or mode (indicative or imperative).

Semantic technology is a way of processing/interpreting content that relies on a variety of linguistic techniques/processing, including text mining, entity extraction, concept analysis, natural language processing, categorization, normalizing, federating and sentiment analysis. As opposed to traditional technologies that process content as data, semantic technology is based on not just data, but the relationships between the data.

The heart of semantic technology is the quality of results derived from the complexity and richness of the network. The semantic network is a map of associations and meanings of words that includes definitions for and relationships among all words. When it comes to analyzing text, this network enables both high precision and recall in search, and automatic categorization and tagging.

Semantic technology is well suited to solve some of the financial sector's most important challenges in the areas of knowledge management, customer service and sentiment monitoring.

## **Knowledge Management: More than just search**

Nowhere is semantic technology more important than in the knowledge management arena where the large volumes of data to be managed can quickly turn into an obstacle rather than an asset.

Knowledge management is at the heart of any organization's attempts to maximize business intelligence, because at every turn, there is a need to access valuable corporate intelligence that is locked in core business applications or hidden in information silos across the organization, and it grows daily. Being able to locate this information quickly requires tools that are able to structure this information so that it can be retrieved no matter where it lives.

And this is where semantic technology comes in.

Semantic technology undertakes both the access to business data already gathered and stored in fielded form (in databases and in data warehouses, for example) and the access to business information trapped in unstructured text (such as web pages, Word documents, bodies of e-mail messages.) Through its ability to filter, make connections and identify patterns within and between data, and because it is not limited by keyword technology that does not take meaning and context into account, users are able to locate all of the available data, and can retrieve only what is relevant.

Applied in the enterprise for knowledge management, semantic technology is able to power a new level of discovery and collaboration that unlocks intelligence hidden in internal business applications and from the deepest corners of the web, allowing users to distinguish between what is useful in the mass of data, and what is not.

This means that semantic technology can enable identification and analysis of internal customer and product data, for example, but it can also pull information from across the web, bringing social data about your customers, vendors and partners inside your organization to provide a full picture of intelligence from both inside and outside the firewall.

For financial institutions, this enables the ability to integrate customer and banking data from merged operations and applications as a result of M&A to add additional, disparate data to integrate with current data stores, and it powers advanced query capabilities for managing and discovering relationships between data sets.

## **Customer Care: Using semantics for valuable insight**

Financial institutions have been among the first organizations to leverage their online presence into an effective tool to implement unique and innovative business strategies. Customers have turned to online banking for its convenience and today, these online storefronts are a complete channel to interact with the majority of their customer base.

Customer satisfaction is a major component in a company's overall growth and well-being—and more than just delivering a product or service. Customer service encompasses listening, responding and engaging directly with the consumers, and today, that includes emails, text messages, the internet and social media. Organizations must have a high competency for dealing with customers, which includes not only being

able to respond to them in real time, but also understanding their needs without having to be told.

Semantic technology has the ability to help financial institutions provide an intuitive and streamlined approach to customer service that goes beyond traditional CRM tools. By taking advantage of an organization's structured and unstructured data about customers—information stored in internal CRM databases and contact management software, as well as emails—and integrated with the information available on the web, customer care can be taken to a new level. This information translates to valuable insight when customers interact with call centers and online support.

In addition, natural language processing technologies implemented in self help customer solutions like 1-800 numbers, SMS and online information forms also allow the system to understand a customer's request, providing an even greater customer service reach to provide immediate, responses to customer queries.

## **Sentiment Analysis: Hearing the voice of the customer**

The voice of the customer is an invaluable resource to corporations. Successful competitive positioning, advertising and price all are dependent upon customers and their feedback. Today, customers have access to an even greater voice by which to make their opinions heard—the internet. The internet amplifies customer feedback in online news, blogs and on social media like Twitter and Facebook, and it's a voice you can't afford to ignore.

According to a survey from Opinion Research Corp., 84% of Americans believe that online customer reviews influence their decision to purchase a product or service. Keeping track of customer feedback online—social media, blogs, forums, etc.—is crucial to a brand's success, but given the unstable quality of this information, being able to filter the social media noise (misinformation, insignificant rants) and identify and evaluate information of relevance presents even more of a challenge.

Traditional search tools are able to find the presence of specific keywords, but are unable to determine actual opinion. Semantic technology is not limited to this. Instead, it uncovers the meanings that words express in their proper context, and can understand the sentiment expressed or implied in a text.

Semantic technology provides business analytics that make organizations aware of the customer information, feedback and ideas that customers are sharing on the internet. The depth of understanding and insight it provides is equivalent to more traditional focus groups and surveys, but without the time and expense. And, it is able to identify "tipping points" from internal resources like customer emails or feedback via support centers, as well as from across the web, that contain information on competitors, feedback on products and trends and insight that can help companies become aware of product defects or other issues that gives companies a competitive advantage.

## Key Benefits of Semantic Technologies

**Gives Structure to Unstructured Data.** One of the major benefits of semantic technologies is the ability to structure unstructured data. Text documents can be read and interpreted, and key data elements extracted automatically.

Every area or function within a financial services firm has an associated document repository. This can be an electronic repository of scanned or PDF documents, or simply a physical filing cabinet. The Semantic Wave Report published by Project 10X estimated that 70% to 80% of all data within a financial services firm is unstructured. These document types can include prospectuses, offering statements, shareholder reports, loan applications, loan agreements, contracts and many other types of documents.

One application that seeks to unlock and open this wealth of information is the Recognos Financial Document Advisor. The purpose of the Document Advisor is to allow users to access their text or unstructured data as if it were maintained in a relational database – or at least close to it. Documents are automatically indexed according to their components or chapters. This can be based on the actual table of contents, a generic table of contents, or an industry standard taxonomy.

The next step in the process is to develop and refine the ontology associated with the questions a user may wish to ask of a document. The questions may be as simple as identifying a specific data point, or as complex as explaining sophisticated terms and conditions.

The concept of being able to ask questions of a text document is quite remarkable in and of itself. One application of this has been developed for clients of Mutual Fund firms. In this application, the most frequently asked questions concerning a mutual fund were categorized and programmed. As a result, a client can visit the Fund firm's website, access their prospectus, select their question, and receive the highlighted response in the body of the document itself.

Recently, several large financial institutions were heavily fined for foreclosing on mortgages that were not eligible for foreclosure. It would have been a simple matter for the Document Advisor to "read" the mortgage agreements and segregate the eligible from the ineligible.

Over 75% of all inquiries to an insurance company pertain to coverage. The Document Advisor can easily respond to these questions either directly to the policy holder (client) or to the insurance company's customer service representatives. The list of potential uses for the Document Advisor is as extensive as the many types of documents that exist – both within financial services, and in business in general.

**Integrates Data from Multiple Sources.** Another major benefit of semantic technologies is the ability to integrate data from many sources quickly and non-invasively. Traditional data integration efforts require data normalization and generally the creation of a new database to house the integrated data. These efforts generally take many months, and are costly and difficult to maintain. With semantic technologies, the effort is reduced from months, to days. In addition, the need for data warehousing is virtually eliminated as all data in an organization, regardless of where it resides, can be viewed as already being part of a virtual data warehouse.

**Able to Deeply Mine Data.** A third major benefit of semantic technologies is the ability to deeply mine data and discover relationships between data points that previously would have required a supercomputer. As an investment research tool, this opens up possibilities for developing new trading algorithms, new or previously undiscovered trends and the ability to link and perform operations on data from multiple sources for the production and distribution of reports to management, operations and clients.

Semantic technologies open new doors and paths to managing data and solving very specific problems within financial services organizations. While many of these problems or issues could theoretically be solved employing more traditional technologies, the time and cost of developing solutions using these older technologies is often prohibitive and sometimes impossible. Semantics is simply faster, far less costly and produces a richer result than traditional technologies.

## To Learn More

**Expert System** is the leading provider of semantic software that discovers, classifies and interprets text information. All Expert System products, which are based on the patent pending technology COGITO®, leverage the company's expertise in the development of business solutions for the primary markets (i.e. Automotive, Consumer Electronics, Oil & Gas, Media, Mobile, etc.) and support the activities of Knowledge Management, Customer Care and Intelligence. Worldwide customers include Eni Group, Pirelli, ANSA, Telecom Italia, Microsoft, BNP Paribas, the Italian Ministry of Defense and the Ministry of Interior Affairs. For more information, visit: [www.expertsystem.net](http://www.expertsystem.net).

Bryan Bell, VP, Enterprise Solutions, Expert System  
[bbell@expertsystem.net](mailto:bbell@expertsystem.net)  
224-357-8080

**Recognos Financial** was founded in 2008 by the original partners in Xcitek Inc., a well known market data vendor (acquired by IDC in 2007) and Recognos Inc., a Silicon Valley based systems development firm. Headquartered in New York, its goal is to bring together semantic technologies with financial data to provide:

- More useful data
- Greater Insight
- Increased Flexibility
- Lower Cost

In addition to being a data provider, Recognos Financial offers data centric semantic technology development services. Recognos Financial, together with its strategic partners offer complete end-to-end innovative semantic solutions for all types of business issues throughout the Financial Services Industry.

Drew Warren, Recognos Financial  
[dwarren@recognosfinancial.com](mailto:dwarren@recognosfinancial.com)  
212-785-5200 ext. 378  
646-895-1467

**SemanticWeb.com** is the leading publication about the business of the Semantic Web and the use of Semantic Technologies in business settings. SemanticWeb.com also produces the popular series of Semantic Technology "SemTech" conferences. [www.SemanticWeb.com](http://www.SemanticWeb.com)

Eric Franzon, VP Community, SemanticWeb.com  
[eric@semanticweb.com](mailto:eric@semanticweb.com)