



SmartSearch

A Search Tool for
Smarter Data Retrieval



where business meets innovation

New Technology from DIT



A semantic search tool that queries internal and external data sources

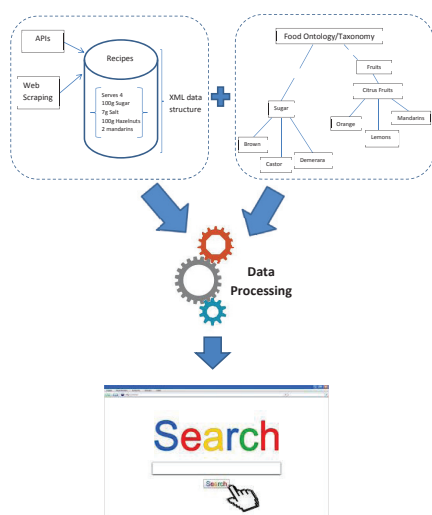
SmartSearch is a search tool created by researchers at the Applied Intelligence Research Centre (AIRC) at DIT in partnership with CeADAR – The National Centre for Applied Data Analytics Research.

The task of searching through product or service queries can be a key part of a company's data analysis or current care processes. Typically these searches rely on manually selected search terms which can be time-consuming and ineffective.

SmartSearch goes beyond state-of-art by allowing a general user to perform domain specific semantic searches of a database via web-based Google-like front-end. IDC predicts that annual spending in big data will exceed \$48 billion by 2019.

SmartSearch operates as follows. It first creates a knowledge base of searchable information from websites and through specialised software interface programmes. This knowledge base is then combined with online ontologies (both pre-existing and user-developed) to create a definitive list of searchable terms. It is this combination of standard structured database searching and additional terms extraction via ontologies that represents the real novelty of SmartSearch.

SmartSearch provides the platform for developers to build bespoke enterprise search environments. To implement the system, users need to provide a knowledge base of domain-specific terms as well as access to relevant domain ontologies. In this way, the general user can perform domain-specific semantic searches. For instance, in a food-based domain, a user could search for "nuts" and SmartSearch would return a list of products containing, for example, cashews and almonds, as well as all products that have these nuts within their ingredients, such as sponge cake with marzipan since marzipan contains ground almonds.



Above: The key components of the SmartSearch system

Applications

The SmartSearch tool can be used for information retrieval and thus forms part of an overall corporate content management system.

Employees can use SmartSearch to query enterprise data when dealing with customer or supplier queries.

Access to SmartSearch enables data mining to analyse retail sales, social media content and competitor activity, and generate forecasts for key variables using predictive modelling.

In the areas of social selling and prospecting, SmartSearch can be used to search internal and external domains to generate leads.

Opportunity

The market for big data technology and services will grow at a compound annual growth rate of 23 percent through to 2019, according to a forecast issued by International Data Corp (IDC) in November 2015. IDC predicts annual spending will reach \$48.6 billion in 2019 and software — information management, discovery and analytics and applications software — is leading the charge with an annual growth rate of 26 percent.

SmartSearch software has a wide spectrum of potential applications particularly for companies that deal with information retrieval tasks on a regular basis.

SmartSearch allows for the integration of internal data with external ontologies to improve the search process in a company's internal database, providing richer data.

The task of searching through product or service queries is often a key part of a company's customer care processor data analysis. SmartSearch has the potential to improve efficiencies in customer care delivery and strengthen analytics capability using a broad range of internal and external metrics.

Advantages

SmartSearch goes beyond existing information retrieval and content management systems:

“SmartSearch offers a wide spectrum of potential applications particularly for companies that deal with information retrieval tasks on a regular basis.”

- **Intuitive and Intelligent** – SmartSearch uses a structured and enhanced ontology-based search (semantic search) which uses reasoning to extract a fuller meaning of the term being searched for.
- **Efficient, Accurate and Relevant** – The structured ontology-based search augments a query-based system that incorporates elements of natural language processing (NLP), which can help companies to improve the efficiency of documentation processes, improve the accuracy of documentation, and identify the most relevant information from large databases.
- **Enables Broader Search** – Whereas existing products are principally concerned with the classification and search of data from internal documents, SmartSearch is designed to integrate external ontologies to go beyond simple keyword search and to use the reasoning potential inherent in these external ontologies to enhance and improve the search process in a company's databases.

Stage of Development

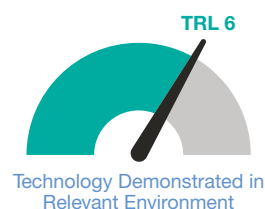
SmartSearch has been developed in the DIT Applied Intelligence Research Centre (AIRC) as part of CEADAR - the Enterprise Ireland funded Technology Centre for Data Analytics.

The SmartSearch system was designed using a combination of Python, Java (for connection to a semantic reasoner), Javascript (jQuery, Bootstrap), HTML and CSS.

A prototype demonstrator has been developed, tested and executed in order to validate the proof of concept. The technology is capable of demonstration and evaluation as a standalone platform but would require further software development to fully productise the code and integrate it with a company's internal systems.

DIT is currently seeking expressions of interest from potential licensees interested in using the technology for internal enterprise applications or business partners interested in deploying it as a commercial system. The technology may be licensed through the CeADAR Technology Centre.

Technology Readiness Level (TRL)



DIT Hothouse Technology Transfer Office

Dublin Institute of Technology,
Aungier St, Dublin 2
+353 1 402 7179 hothouse@dit.ie
www.dit.ie/hothouse