1 YEAR SIGSEMIS

SIGSEMIS
Semantic Web & Information Systems

AIS

AIS SIGSEMIS: A Worldwide Social and Information Network of Excellence for Semantic Web and Information Systems

Interview

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Richard Watson

President of AIS

"If IS research has a context for this century, it should be to tackle the problems that matter to everyone"

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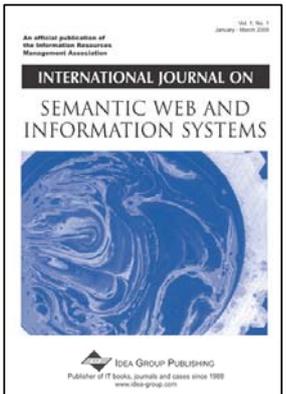
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Together we make the Semantic Web a Reality

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The Official Quarterly Newsletter of AIS Special Interest Group on Semantic Web and Information Systems

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Projects Corner: A column dedicated to dissemination of project outcomes

PROJECT ONE: Description of the SEWASIE Project, provided by Sonia Bergamaschi, Christiph Quix, Matthias Jarke

SEWASIE

EU IST Project

http://www.SEWASIE.org/

SEWASIE (SEmantic Webs and AgentS in Integrated Economies) aims to design and implement an advanced search engine enabling intelligent access to heterogeneous data sources on the web via semantic enrichment to provide the basis of structured secure web-based communication.

Introduction

SEWASIE is implementing an advanced search engine that provides intelligent access to heterogeneous data sources on the web via semantic enrichment to provide the basis of structured secure web-based communication. SEWASIE provides users with a search client that has an easy-to-use query interface, and which can extract the required information from the Internet and can show it in a useful and user-friendly format. From an architectural point of view, the prototype will provide a search engine client and indexing servers and ontologies.

There are many benefits to be had from such a system. There will be a reduction of transaction costs by efficient search and communication facilities. Within the business context, the system will support integrated searching and negotiating, which will promote the take-up of key technologies for SMEs and give them a competitive edge.

The Business Scenario

Throughout Europe, much of the industrial fabric is made of small and medium-sized enterprises (SMEs) in fields such as agriculture, manufacturing, commerce and services. For social and historical reasons, these tend to aggregate into sectorial clusters in various parts of respective countries. Today, this kind of economic organization is threatened by globalisation.

One of the keys to sustainability and success is being able to access information. This could be a cheaper supplier, an innovative working method, a new market, potential clients, partners, sponsors, and so on. Current Internet search tools are inadequate because they not only are they difficult to use, the search results are often of little use with their pages and pages of hits.

Suppose an SME needs to find out about a topic - a product, a supplier, a fashion trend, a standard, etc. For example, a search is made for 'fabric dyeing processes' for the purpose of finding out about the disposal of the dyeing waste material. A query to www.google.com for 'fabric dyeing' listed 44.600 hits at the time of writing, which related not only manufacturers of fabric dyeing equipment, but also the history of dyeing, the dyeing technology, and so on. Eventually a useful contact may be found, and the search can continue for relevant laws and standards concerning waste disposal. But is it *law* or the
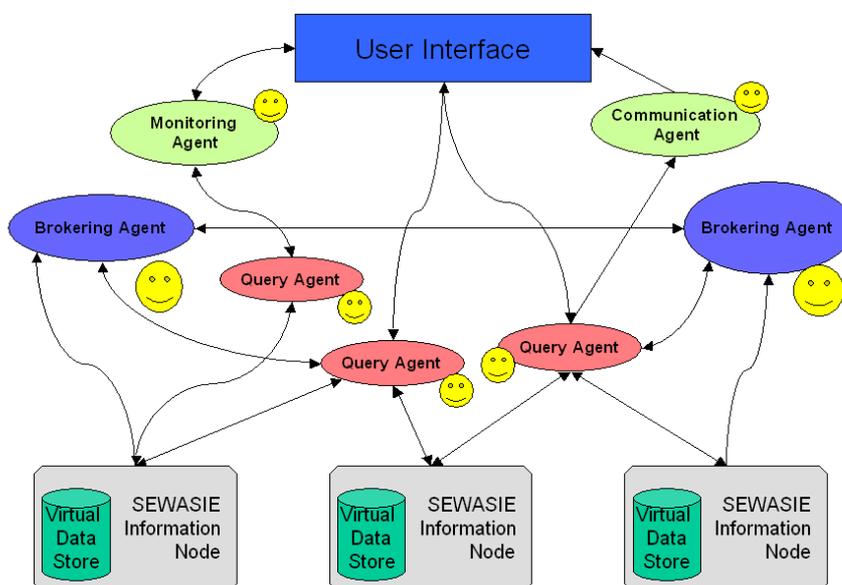
interpretation of the law? What if the laws are of a different country where the practices and terminologies are different?

SEWASIE Architecture

A user should be able to access the SEWASIE system through a central user interface where (s)he are provided with tools for query composition, for personalising search results and other web data, for visualising results, and for communicating with other business partners about search results, e.g. in electronic negotiations.

SEWASIE Information Nodes (SINodes) are mediator-based systems, providing a virtual view of the information sources managed within a SINode. Each SINode exports an ontology that represents the metadata of its virtual view. These ontologies are further integrated in Brokering Agents which build the bridge between the SINodes and the user interface. The user interface transfers queries to the Query Agents that are intelligent information agents with the specific task of solving a query. The query agents will use the Brokering Agents to get metadata about the SINodes, i.e. to identify the SINodes which have to queried to answer a specific query. Monitoring Agents filter and contextualise answers of the Query Agent, possibly linked to OLAP reports. They serve also as intelligent filters, which monitor Web sites of competitors or potential collaborators. Finally, the Communication Tool provides the means for structured web-based communication. It uses query results, contextualised information and ontologies from SINodes as the basis for the communicative content. The Communication Agent performs communication tasks in the early phase of electronic interactions.

Results

Following the design phase and the parallel development of the first core modules (query management, ontology design, user interface) the project achieved the first integration of the core and auxiliary modules into a first semantic search engine prototype. While several query types are already supported, more subtle and complex query formats are being explored to define common interpretations and query management policies. Techniques have been studied and tested to improve the workflow at the user end, at the intermediary level, and at the source end. This is particularly significant both from the design and development point of view, since it extends the general "ergonomics" of the system. It is also significant from a general economics point of view, since the deployment of the system in a real work environment will require an enterprise or even sector-level strategy to achieve an opportunity threshold whereby the users perceive the system as a useful tool to use due to available content and quality of results, with a favourable cost/benefits ratio.

The extended features of the system include negotiation systems, OLAP systems, monitoring and visualization components. All of these are being integrated with the basic search engine user interface to provide an integrated user environment where sophisticated analysis and processing may be performed. This may require substantial user interaction, like in a negotiation system where results from a query for suppliers of certain goods are injected to allow the establishment of (possibly several) contacts leading to competitive bids and a final contract. Alternatively, it may require no or minimal user participation while monitoring a certain information domain for specific events to occur, the events being defined as changes to the information content of some sources, content whose presence or absence may be decided with a query which is repeated periodically.

User testing is under way and more testing is currently being planned to validate the integrated system in more and more complex and demanding environments. The first test activities focused on the textile sector of a dynamic industrial district in the province of Modena (Italy), involving CNA and SMEs, and in collaboration with some medium-sized German firms (specifically for the OLAP, monitoring, and visualization modules). A second test plan is being finalised to focus on a mechanical high tech industry (moulding of plastic and metal). More details on the results of the project have been published in several publications, see the project web site (http://www.sewasie.org) for a complete list.

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A special section: All the interviews of the first year of AIS SIGSEMIS Bulletin

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