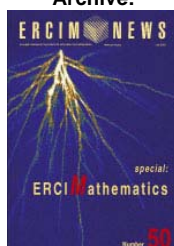


This issue in pdf  
(64 pages; 13,7 Mb)

**Free subscription**

**Archive:**



**previous issue**  
(Number 50  
July 2002):  
Special theme:  
ERCIM Mathematics

**all previous issues**

**Next issue:**

January 2003

**Next Special theme:**  
Embedded Systems

**About ERCIM News**



**SPECIAL THEME: SEMANTIC WEB**

< [Contents](#) ERCIM News No. 51, October 2002

## An Ontology-Oriented Solution for Knowledge-Intensive Organisation

by Emanuele Della Valle and Maurizio Brioschi

**Knowing what you know is increasingly a real problem in many organisations whose core competence is knowledge. We believe that using state-of-the-art Web-based Knowledge Management (KM) technologies will not be sufficient in the immediate future, since the lack of formal semantics will make it extremely difficult to make the best use of the massive amount of stored data.**

Knowledge-intensive organisations are more common than you might expect: R&D departments and education centres are among those which first come to mind, but any community of interest, any team, any collaborative group that maintains a large amount of distributed and semi-structured data can fit in this category.

As Intranet solutions have increased in popularity, they have become populated with documents, forms, calendars of events, news, link collections and applications such as databases, newsletters and forums. As a consequence, most organisations have ended up with a huge repository of semi-structured knowledge distributed over the Intranet. This has resulted in some common maintenance and accessibility problems. On the one hand, the administration of these knowledge sources cannot be centralised, because they are maintained only as long as they are useful for those who write them. On the other hand, all members of the organisation, regardless of differences in cultural background and level of expertise, should be able to find what they need: the form for initiating an administrative procedure, the application to broadcast urgent news to a community of interest, someone with a specific set of skills to whom a task can be assigned, a tailored course to learn how to perform an unfamiliar operation, etc.

So far, the combination of Web technologies (XML, J2EE, SOAP, etc) and knowledge management methodologies has proved able to address some of these problems. Intranet portals, based on a collaborative and distributed editorial model, can provide a single point of access and a good content management solution. Moreover, the development of component-based applications, in particular with emerging Web services technology, provides the strong decoupling and easier composition required by these kinds of data-intensive Web applications. However, what our state-of-the-art technology can provide is good human access to this knowledge. While a good Intranet search engine can lead the user to a set of knowledge sources, because of its lack of common sense, it is unable to analyse them.

Semantic Web technology, with the explicit introduction of a formal semantics for each knowledge source, will make it possible for a machine to automatically process the source and in a way, to understand it. In particular, the use of ontologies, which are explicit conceptualisations of a shared understanding of a domain, can enable a reasoning service to analyse the knowledge stored in the sources. In addressing the common problems which arise in the Intranet environment of a typical knowledge-intensive organisation, the e-Service Technologies unit of CEFRIEL is working on two projects and will commence a number of further projects in the coming autumn.

In collaboration with the KM competence centre of Getronics, we are currently running the sKM (semantic Knowledge Management) project. The goal of sKM is to use ontologies as the core component of a methodology to select and configure the most suitable KM solution for a specific organisation. In order to achieve this, we validate the possibility of integrating into a framework a set of freely available tools for designing and maintaining ontologies. We monitor the available languages and tools and, so far, we have selected DAML+OIL as the language, OILed v3.4 as the editor and FaCT v2.2 as the reasoner. Moreover, we have conceived and implemented two tools: a graphic visualiser VisualDAML+OIL and an ad hoc report generator, ReportDAML+OIL.

We use ReportDAML+OIL to produce the information needed by a technician to configure a KM solution. The next step is to study the possibility of integrating current state-of-the-art KM solutions with reasoner-able services in order to address the common maintenance and accessibility problems. The options we are considering include a framework for automatic publication of content based on the semantics associated with the content, a mechanism to support the annotation which deduces implicit knowledge from that which is explicitly given, and a solution to empower the basic syntactic search mechanism widely available with the use of the given semantics. This means the search engine could learn to find what you mean, rather than simply what you say!

In the meantime, we're implementing COPPER (CEFRIEL Open Portal Project for Enterprise Resources). This is an industrial-strength portal solution built only with open-source technologies (Apache, Tomcat, Velocity, PostgreSQL, Java). We have already used it for building an Intranet portal and we plan to adopt it as our own testbed and training field for the prototypal implementation of those reasoner-able services described above. In the coming autumn we will start several new projects. In 'Semantic Enhanced e-Learning', we will study the problems which arise in populating and maintaining an open learning object repository with special attention paid to the construction of ad hoc courses. Moreover, we will start a technology transfer project that concerns both the skill management and the accessibility of a CAD-drawing repository. Last but not least, we're looking at the possibility of using semantic-enabled Web services in an e-government Intranet application integration scenario.

People involved: Maurizio Brioschi, Stefano Campanini, Paolo Castagna, Emanuele Della Valle, Marco Riva, Nicola Simeoni.

**Links:**

<http://etechdemo.cefrieli.it/sw>

<http://www.cefrieli.it/etech>

**Please contact:**

Emanuele Della Valle

CEFRIEL, Politecnico di Milano, Italy  
Tel: +39 02 23954 324  
E-mail: [emanuele.dellavalle@cefriel.it](mailto:emanuele.dellavalle@cefriel.it)

**Survey:**

Please click the button if you find this article interesting

[See the results without recommending this article.](#)