



D 3.2.9 Report on Industry-Education cooperation

Coordinator: Lyndon J B Nixon (FU Berlin)

With contributions from Jörg Diederich (University of Hannover), York Sure (University of Karlsruhe)

Abstract.

EU-IST Network of Excellence (NoE) IST-2004-507482 KWEB
Deliverable D3.2.9 (WP3.2)

This report contains the results of the initial attempts at co-operation between Semantic Web educationalists and interested Industry. As a result, we identify the key gaps in the educational effort to industry and show how KnowledgeWeb is in the position to fill those gaps and facilitate successful professional education in the Semantic Web area.

Document Identifier:	KWEB/2006/3.2.9/v1.1
Class Deliverable:	KWEB EU-IST-2004-507482
Version:	V1.1
Date:	January 25, 2006
State:	Final
Distribution:	Public

Knowledge Web Consortium

This document is part of a research project funded by the IST Programme of the Commission of the European Communities as project number IST-2004-507482.

University of Innsbruck (UIBK) – Coordinator

Institute of Computer Science,
Technikerstrasse 13
A-6020 Innsbruck
Austria
Contact person: Dieter Fensel
E-mail address: dieter.fensel@uibk.ac.at

France Telecom (FT)

4 Rue du Clos Courtel
35512 Cesson Sévigné
France. PO Box 91226
Contact person : Alain Leger
E-mail address: alain.leger@rd.francetelecom.com

Free University of Bozen-Bolzano (FUB)

Piazza Domenicani 3
39100 Bolzano
Italy
Contact person: Enrico Franconi
E-mail address: franconi@inf.unibz.it

Centre for Research and Technology Hellas / Informatics and Telematics Institute (ITI- CERTH)

1st km Thermi – Panorama road
57001 Thermi-Thessaloniki
Greece. Po Box 361
Contact person: Michael G. Strintzis
E-mail address: strintzi@iti.gr

National University of Ireland Galway (NUIG)

National University of Ireland
Science and Technology Building
University Road
Galway
Ireland
Contact person: Christoph Bussler
E-mail address: chris.bussler@deri.ie

Universidad Politécnica de Madrid (UPM)

Campus de Montegancedo sn
28660 Boadilla del Monte
Spain
Contact person: Asunción Gómez Pérez
E-mail address: asun@fi.upm.es

École Polytechnique Fédérale de Lausanne (EPFL)

Computer Science Department
Swiss Federal Institute of Technology
IN (Ecublens), CH-1015 Lausanne.
Switzerland
Contact person: Boi Faltings
E-mail address: boi.faltings@epfl.ch

Freie Universität Berlin (FU Berlin)

Takustrasse, 9
14195 Berlin
Germany
Contact person: Robert Tolksdorf
E-mail address: tolk@inf.fu-berlin.de

Institut National de Recherche en Informatique et en Automatique (INRIA)

ZIRST - 655 avenue de l'Europe - Montbonnot
Saint Martin
38334 Saint-Ismier
France
Contact person: Jérôme Euzenat
E-mail address: Jerome.Euzenat@inrialpes.fr

Learning Lab Lower Saxony (L3S)

Expo Plaza 1
30539 Hannover
Germany
Contact person: Wolfgang Nejdl
E-mail address: nejdl@learninglab.de

The Open University (OU)

Knowledge Media Institute
The Open University
Milton Keynes, MK7 6AA
United Kingdom.
Contact person: Enrico Motta
E-mail address: e.motta@open.ac.uk

University of Karlsruhe (UKARL)

Institut für Angewandte Informatik und Formale
Beschreibungsverfahren – AIFB
Universität Karlsruhe
D-76128 Karlsruhe
Germany
Contact person: Rudi Studer
E-mail address: studer@aifb.uni-karlsruhe.de

University of Liverpool (UniLiv)

Chadwick Building, Peach Street
L697ZF Liverpool
United Kingdom
Contact person: Michael Wooldridge
E-mail address: M.J.Wooldridge@csc.liv.ac.uk

University of Sheffield (USFD)

Regent Court, 211 Portobello street
S14DP Sheffield
United Kingdom
Contact person: Hamish Cunningham
E-mail address: hamish@dcs.shef.ac.uk

Vrije Universiteit Amsterdam (VUA)

De Boelelaan 1081a
1081HV. Amsterdam
The Netherlands
Contact person: Frank van Harmelen
E-mail address: Frank.van.Harmelen@cs.vu.nl

University of Manchester (UoM)

Room 2.32. Kilburn Building, Department of
Computer Science, University of Manchester,
Oxford Road
Manchester, M13 9PL
United Kingdom
Contact person: Carole Goble
E-mail address: carole@cs.man.ac.uk

University of Trento (UniTn)

Via Sommarive 14
38050 Trento
Italy
Contact person: Fausto Giunchiglia
E-mail address: fausto@dit.unitn.it

Vrije Universiteit Brussel (VUB)

Pleinlaan 2, Building G10
1050 Brussels
Belgium
Contact person: Robert Meersman
E-mail address: robert.meersman@vub.ac.be

Work package participants

The following partners have taken an active part in the work leading to the elaboration of this document, even if they might not have directly contributed writing parts of this document:

Freie Universität Berlin (FU Berlin)
University of Hannover
University of Karlsruhe

Changes

Version	Date	Author	Changes
0.1	15-10-2005	Lyndon Nixon	Structure
0.2	25-11-2005	Lyndon Nixon	First draft (sections 1 and 2)
0.3	05-12-2005	Lyndon Nixon	Section 3
0.5	07-12-2005	Lyndon Nixon	Sections 4 and 5
0.6	07-12-2005	Jörg Diederich	Added contribution
0.7	09.12.2005	Jörg Diederich, Lyndon Nixon	Comments and changes
0.75	10.12.2005	York Sure	Comments
0.9	12.01.2005	Lyndon Nixon	Revision after comments
1.0	13.01.2005	Lyndon Nixon	Version for Quality Control
1.1	25.01.2005	Lyndon Nixon	Changes after Quality Control

Executive Summary

In the Education area of the EU Network of Excellence, KnowledgeWeb, Semantic Web education for professionals was identified as one of the challenges to achieving a key goal of the network: the uptake of Semantic Web technologies by industry.

Education for professionals is facilitated in two ways: firstly, through the provision of learning materials tailored to a professional audience; secondly, through the organisation of events which attract interested members of industry and offer tutorials by Semantic Web experts using tailored learning materials.

This report outlines what has been done in KnowledgeWeb in terms of both of these aspects, and what has been already learnt from the preparation and use of appropriate learning materials as well as the organisation and evaluation of events for professionals. As a result, we identify the key gaps in the educational effort to industry and show how KnowledgeWeb is in the position to fill those gaps and facilitate successful professional education in the Semantic Web area.

Contents

1	Introduction	1
2	Learning Materials for Professionals	2
2.1	Corporate Education Course Content - CECC Workshop	3
2.1.1	Overview	3
2.1.2	Main lessons learned:.....	3
2.2	Industrial learning material production.....	4
3	Events for professionals	7
3.1	Semantic Web Information Day	7
3.2	XML Days Tutorial.....	7
4	Experiences and conclusions	9
4.1	Learning materials	9
4.1.1	Learning Material Statistics	9
4.2	Events.....	9
4.2.1	Industry Event Questionnaire	10
4.3	Conclusion	14
5	Future outlook	16
5.1	Learning Materials	16
5.2	Events.....	17
5.3	Conclusion	18
	References.....	19
	Appendix A: Perspectives for Semantic Web Applications in Europe.....	20
	Appendix B: Semantic Web Use Cases	23

1 Introduction

As the tasks and goals for the European Association for Semantic Web Education (EASE¹) were drawn up [1] one of the proposed scenarios was education for professionals. This envisioned providing training programs for industrial learners such as: detailed technical courses for programmers, introductory technology seminars for software architects and executives, and individual consultations on concrete proposals for project leaders. Based on the aims of this scenario, co-operation between the Industry and Education areas was planned. This deliverable is an initial report on that co-operation, lessons learnt and plans for the future.

The KnowledgeWeb Network of Excellence states that the transfer of Semantic Web technologies from academia to industry is one of its major goals. However, it does not suffice to make industry aware of the potential of particular Semantic Web technologies for their business problems (the remit of the Industry Area activity of Knowledge Web). This is certainly a worthwhile endeavour but industry must also be able to migrate its systems to those Semantic Web technologies so that it can actually benefit from the industrial requirements analysis and technology recommendations that are taking place in the Industry Area. Hence it becomes clear that the Education Area also plays a significant role if the major goal of technology transfer is to become a reality.

In the Education area we focus on producing good quality learning materials which are focused at business professionals. As industries become aware of the Semantic Web and seek information about its potential for them it is vital that they can find material that is aimed at their requirements, rather than at an academic level. Hence we produce our learning materials in close synergy with the industrial use cases collected from the Industry Board and their analysis. These learning materials can then be exploited in industry-specific events, aimed at raising awareness of the industrial application of Semantic Web technologies, combined with prototypical demonstrations to concretely indicate the technological value for business. Subsequently, and as the use case analysis in the Industry Area continues, we want to move to producing and disseminating success stories, experience reports (e.g. on the migration of enterprise systems to Semantic Web technologies) and training materials. As a result, the Education Area will grow to offer a useful and indeed vital set of resources aimed at industry which can demonstrate the industrial value of Semantic Web technologies (based on concrete business use cases), share first experiences of technology migration and solution to typical enterprise problems and provide the means for training in the new technologies so that European industry can move forward in competitiveness through this next generation of ontology-based technological solutions.

¹ Previously known as VISWE

2 Learning Materials for Professionals

As part of the Education Area activity, a learning material repository was set up, named REASE (Repository for the European Association for Semantic Web Education)[2]. This is intended to act as a central location for learning materials concerning the Semantic Web provided by the Networks of Excellence KnowledgeWeb and REWERSE. Every learning resource can be catalogued under relevant categories to ease discovery by interested parties. At the end of 2005 REASE contains 60 items. In the first analysis of learning units on the repository [3] an initial set of 24 learning units was provided by 12 partners. In the conclusion of that analysis it was stated:

“Currently the weakest support is available for professional training. Here partners need to increase their engagement in professional education. On the other hand especially offers in the Community of Practice area may cover the needs of professionals as well. Also, increased co-operation with the industrial work packages may help here”

Likewise, during a first examination of the learning materials in the repository in order to form recommendations for core curricula in the different EASE scenarios [4], four courses were found that could be used in professional training, three of which were available and one in planning:

Semantic Web Core		
Ontologies		
Ontological Engineering and the Semantic Web	UPM	Ready
Semantic Web Technologies		
Semantic Web Information Day	FU Berlin	Ready
Semantic Web Special Topics		
Upgrade legacy content to the Semantic Web	UPM	To be adapted
Semantic portal technology	UPM	Ready

This deliverable likewise concluded that there was a need for more materials for professional education. Both documents were written before the end of the first year of the project, and formed the basis for the inclusion of a new task in the Joint Program of Activities (Months 13-30) aimed at Industry-Education co-operation. In order to support the creation of learning materials suited for professionals, it was decided that during the next program of activities:

- An event should be organized focusing on supporting network participants in how to create suitable materials for professionals;
- Learning materials aimed at professionals would be produced within KnowledgeWeb in co-operation with the Industry Area and tested in the context of an event organized for professionals.

Section 2.1 describes the workshop for industrial content production. Section 2.2 introduces the learning materials that were produced. Then in Section 3 we describe two events organized for professionals in which the learning materials were used and evaluated.

2.1 Corporate Education Course Content - CECC Workshop

One of the first problems when offering educational material for industrial education purposes, for example, to be able to acquire new financial sources for academic scenarios, is how to prepare such materials. As most of the partners in KnowledgeWeb are from academia, a natural solution would be to find a way to transform university courses into industrial courses. However, there is a need to know the requirements of industrial people on such material to be able to perform such a transformation.

Getting to know such industrial requirements was the main objective of the CECC Workshop, held at L3S Research Center, Hannover, on 25th of April 2005.²

2.1.1 Overview

The workshop analysed corporate needs and expectations with regard to digital content for training and qualification needs. It highlighted requirements for adapting academic content and learning material to corporate contexts. It also provided insights into the needs for a successful transfer and re-use of academic content in non-academic settings.

Participants benefited from the workshop by learning about the theoretical as well as best practice knowledge in respect to controlling and coordinating (small) eLearning projects and, most notably, content production projects for prospective users in the corporate sector. It provided orientation about the essentials of a successful transfer of academic knowledge and digital learning content. Within this framework, the basics of didactics and methods in corporate learning scenarios, content-driven and textual requirements, technical realization, technical requirements and impacts, processes as well as the integration of web-based trainings or computer-based trainings in learning management systems were discussed in detail. This was complemented by concrete best practice examples and case studies about the development of professional content and their transfer into multimedia content. At a smaller scale, the workshop also dealt with project management and quality assurance issues as they relate to the main processes involved in content production for corporate users.

2.1.2 Main lessons learned:

- Consider requirements for industrial education material
 - Oriented towards a specific target audience and a specific objective
 - Example: fill a particular knowledge gap

² <http://www.l3s.de/~diederich/cecc/>

- Concerning both content and content presentation (didactics)
 - Industry people might be less motivated than students
- Comprising concrete examples and exercises from the domain of the target audience
- Organize the preparation of industrial material in close cooperation with industrial partners
 - Necessary to explore the knowledge gap and the target audience
 - Requirements often not really known by the industrial partner
 - ➔ Organization consumes up to 50% of the time to prepare material!
- Do not underestimate the necessity of marketing / business models
 - Business people need to know that you have content for them
 - Business people ‘buy’ content only from well-known, highly-reputed universities
 - Without a business model (which also solves copyright issues), content will not be interesting for industry

Hence, there is no good ‘cookbook’ for how to generate industrial materials from available academic materials. It depends on the context of the specific target group.

2.2 Industrial learning material production

It has been identified as a key requirement for learning materials aimed at industry that those materials relate very concretely to the industrial environment, the solution (through Semantic Web technologies) of business problems and the changes required to adapt/migrate enterprise systems to those new technologies. Specifically, business executives would be interested in the demonstration of solutions to business problems which can justify investment in the new technologies (i.e. a means to identify cost/benefit issues) while project leaders and programmers would be interested in actual migration scenarios and the tasks performed to apply the new technology into existing enterprise systems. The important aspect of any learning material would be to enable business professionals to better evaluate the benefit and associated cost of the application of Semantic Web technologies into their enterprise area. In the Education area, we found that existing learning materials do not meet the needs of business professionals in this way.

The KnowledgeWeb Industry area is carrying out a number of activities related to this sort of evaluation. An Industry Board has been formed of leading organizations with an interest in Semantic Web technologies. Business use cases have been collected which represent concrete industrial scenarios that present business problems and offer Semantic Web technologies as a potential solution [5]. These use cases have been evaluated, firstly to answer general questions such as:

- Which business sectors are providing use cases? (i.e. which sectors demonstrate ‘early adopter’ type interest in the new technology?)

- Which business problem areas are being addressed in the use cases? (i.e. which enterprise needs could be focused on as having the strongest industrial interest in a solution?)
- Which technological locks are being identified which prevent Semantic Web migration? (i.e. on what issues does industry look for guidance before being prepared to migrate to the new technology?)

Subsequently a deeper analysis of selected (“low hanging fruit”) use cases was performed [6] to identify the requirements in terms of knowledge tasks and components. At the present phase of work in KnowledgeWeb these requirements are being analysed by the KnowledgeWeb Research area in order to direct the research to industrial requirements and to provide technology recommendations for the use cases [7].

In the meantime, we decided to produce new learning materials based on the Industry area use cases and their analysis. The use cases provide us with concrete examples of business problems, and we focus on those use cases which from the evaluation appears to have the greatest industrial interest in terms of domain and problem. This also positions us to continue to benefit from the ongoing use case collection and analysis in the Industry area, both in introducing new use cases into learning materials and also moving onto success stories, demonstrations of Semantic Web applications in industry and training for enterprise migration, as the parallel work in the Industry area progresses.

Two events organized in Berlin were identified as good potential vehicles for testing out use case-based learning material on an industrial audience. Hence, taking into account the guidelines for industrial learning materials and our experience from the content workshop in Hannover, we produced two sets of slides presenting the use case analysis from the Knowledge Web Industry area:

- Perspectives for Semantic Web Applications in Europe, presented at the Semantic Web Information Day, and highlighting the use cases
 - Knowledge Management (Illy Caffè)
 - New B2C Services (France Telecom)
- Semantic Web Use Cases, presented at the Berlin XML Days tutorial on Semantic Web, highlighted the previous two use cases and additionally
 - Human Resource Management (WorldWideJobs GmbH)

Both sets of learning material follow this format:

- KnowledgeWeb is introduced
- The Industry Board (size, example members)
- Use Cases (collection process, breakdown by industry sector)
- Use case analysis (type of solution sought, technology locks)
- Presentation of selected use cases
- Next steps in KnowledgeWeb (requirements analysis, technology transfer)

- [Link to KnowledgeWeb Industry portal](#)

The learning materials are available for download from the REASE repository. Appendixes A and B show the slides of both learning materials.

3 Events for professionals

It is important to use the learning materials in events attended by business professionals in order to be able to determine their value and find where improvements are necessary to ensure that the materials form an effective educational tool for industry.

3.1 Semantic Web Information Day

The first Semantic Web Information Day was organized by Prof. Robert Tolksdorf (FU Berlin, Networked Information Systems) as an event of the XML Clearinghouse Berlin (<http://www.xml-clearinghouse.de>), a non-profit organization funded by the German Ministry of Research (BMBF) whose aim is to support the transfer of XML technologies as a public service. It took place at the Free University of Berlin. The aim of the event was to introduce attendees from local industry to central topics of the Semantic Web: standard representation languages like RDF(S) and OWL, ontologies and use scenarios for Semantic Web technologies. The 50 participants attending the event had the chance to learn about the Semantic Web during a half-day workshop and exchange opinions about its potential in an industrial setting in a concluding open discussion.

Due to the experience of FU Berlin in providing this kind of event on a regional basis we organized a second Semantic Web Information Day for Professionals in June 2005. This event was planned as part of the KnowledgeWeb NoE activity in educational outreach to industry, benefiting from integrating the local knowledge of XML Clearinghouse with the wider contacts being built up in the KnowledgeWeb Industry Board, the experience and resources of KnowledgeWeb partners as well as the ongoing development and provision of learning units for professionals.

3.2 XML Days Tutorial

The Berlin XML Days has been organized annually since 2003 as the leading German language conference for XML and Semantic Web technologies. The 2005 event attracted over 400 participants. As part of the conference, tutorials are offered on key themes such as XML and Databases, Web Services and the Semantic Web.

In order to offer participants the opportunity to attend a Semantic Web educational event aimed at business professionals a tutorial was organized by the FU Berlin together with Dr York Sure of the University of Karlsruhe. Its goal was to help professionals better understand the potential of the Semantic Web for business processes such as knowledge management and their business problems. Content from the SEKT and Knowledge Web networks was used to communicate the industrial value of the Semantic Web.

The XML Days 2005 was held in September. The tutorial was organized as a half day event with two talks. The description of the talks as given in the publicity material is reproduced below (Part 1 is translated out of the German):

Part 1: Semantic Web Basics (to be held in German) Duration 2 hours

The "Semantic Web" was conceived by Tim Berners-Lee, the inventor of the World Wide Web, as an enriching of the Web through descriptions of its content so that finding and summarizing information by machines could be greatly facilitated. The aim of this part of the tutorial is to offer an overview of the most important methods and technologies in the description of information on the Web, i.e. semantics, that are particularly relevant for Knowledge Management applications.

The content of this part of the tutorial is split into: a general introduction to the problem area, annotation languages, creation and use of ontologies as well as applications. After each section, time will be allowed for discussion.

The possibilities of the Semantic Web, particularly for Knowledge Management, will be presented. The current state of the art in research will be given and possible application areas and concrete tools shown. Through the product range available and reference tools from Semantic Web companies it will be made clear what is already realizable today.

Part 2: Semantic Web Use Cases (to be held in English) Duration 90 minutes

In order to resolve the issues surrounding industrial application of Semantic Web technologies and support uptake by European Industry, the EU has formed a Network of Excellence called KnowledgeWeb, which consists of leading European Semantic Web research institutions and an Industry Board of companies interested in Semantic Web-based solutions for their business processes.

The second part of the tutorial will give an overview of typical business problems in different fields and their potential solution through Semantic Web technologies. We illustrate this through exemplary use cases collected by the Network and specify how through the co-operation between industry and research we can achieve successful technology transfer.

The tutorial should give a feel for the industrial potential of the Semantic Web. However, this potential can only be realized if industrial requirements are met, industry-strength tools are available and the resources exist for training and technology migration. These are the aims of KnowledgeWeb. The tutorial will conclude by giving important indicators as to how interested enterprises could leverage the results in KnowledgeWeb in order to improve their business processes and move to Semantic Web technologies.

4 Experiences and conclusions

4.1 Learning materials

All three learning materials used at the educational events were uploaded onto the REASE learning unit repository:

- Perspectives for Semantic Web Applications in Europe, by Lyndon Nixon (FU Berlin)
- Semantic Web Use Cases, by Lyndon Nixon (FU Berlin)
- Semantic Web Tutorial, by York Sure (U Karlsruhe)

The tracking tools of the repository are useful for us to be able to evaluate the level of interest and the usefulness of these materials. These statistics (see below) were correct at the end of December 2005. It is particularly interesting to note that the Semantic Web Tutorial by Dr York Sure became the second most accessed resource on REASE.

4.1.1 Learning Material Statistics

	Added to REASE on date	Number of times accessed	Current ranking in REASE
Semantic Web Tutorial	27 October 2005	17 (Greece, France, Sweden, USA, Malaysia, Italy, Germany)	2
Semantic Web Use Cases	21 October 2005	11 (Germany, Greece, Sweden, USA, Malaysia, Portugal)	12
Perspectives for Semantic Web Applications in Europe	14 June 2005	4 (UK, Malaysia, Sweden, USA)	19

4.2 Events

The initial events chosen by us to use the learning materials were reasonably small events. The Semantic Web Information Day draws primarily local enterprises while the XML Days is a national event and attracts participants from across Germany (and to a lesser extent Austria and Switzerland). While they can be seen as good starting points to test out an educational event to business professionals, both proved unfortunately limited in capturing large numbers of business participants:

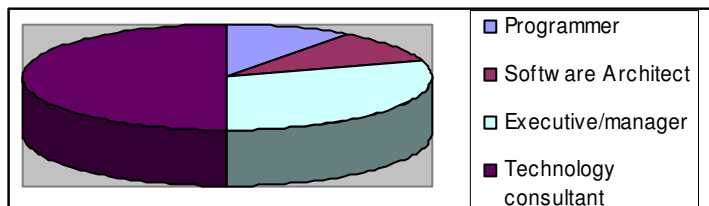
- The Semantic Web Information Day event drew a larger number of academic participants, so the number of business professionals present is hard to estimate.
- The XML Days tutorial drew 6 participants, which was not much lower than other tutorials but a limited number for making an evaluation of the event.

Of course this must be seen in the context of the (perceived) maturity of the Semantic Web for concrete application in businesses. Even though the aim of the learning materials based on the use cases is to demonstrate some concrete applications, our experience indicates that an initial challenge is bringing professionals to such an event in the first place.

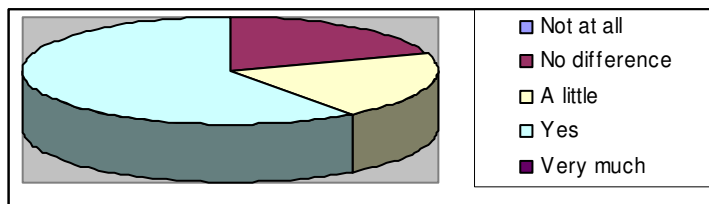
After the XML Days tutorial, a questionnaire was used to gain feedback about the event from the participants. The results from the 5 completed questionnaires are presented below.

4.2.1 Industry Event Questionnaire

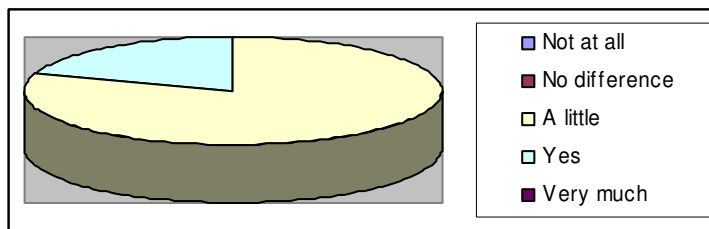
Q1. What is your role within your organisation?



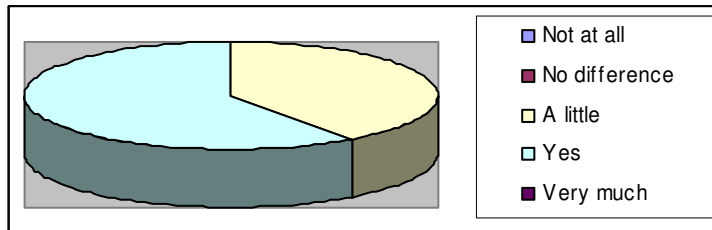
Q2. The tutorial has helped me to better understand better what the Semantic Web is



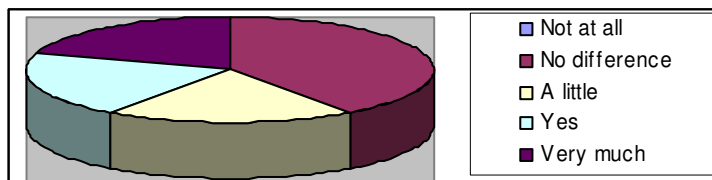
Q3. The tutorial has helped me to evaluate the potential of the Semantic Web for my organisation



Q4. Did the slides help support the presentation of the topic, and will remain useful to you after the tutorial?



Q5. Did you find the length and tempo of the tutorial adequate?

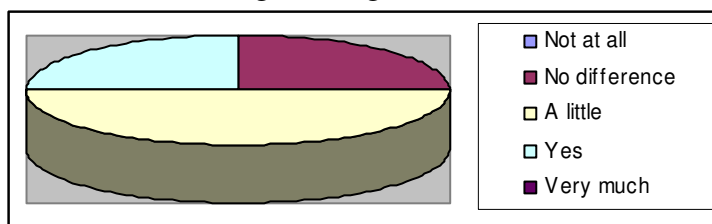


Unsolicited comments: some things faster, some things slower; could have been longer

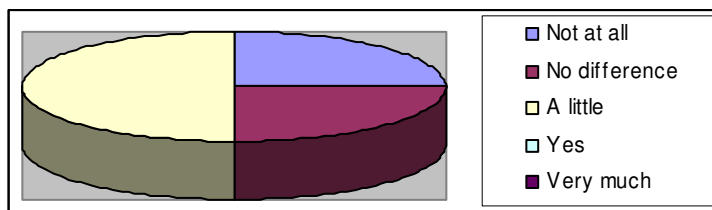
Q6. How relevant was each use case to you?

Unsolicited comments: one participant did not answer this question and commented that the use case presentation was “too short and too general”

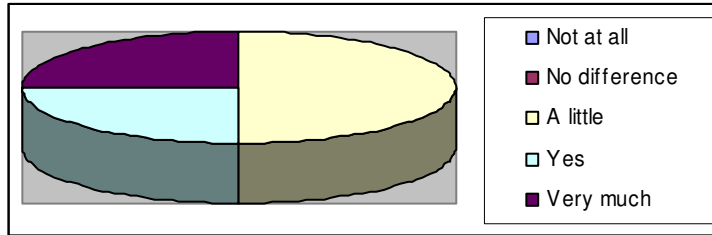
(a) Knowledge Management at Trenitalia



(b) New B2C services in France Telecom

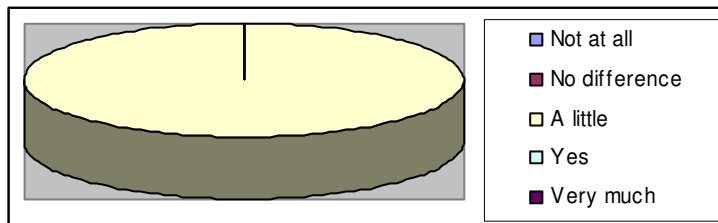


(c) Intelligent personnel recruitment

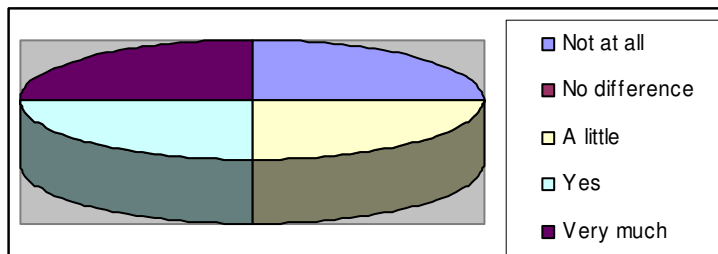


Q7. To what extent did each use case suggest the potential of the Semantic Web for industrial application?

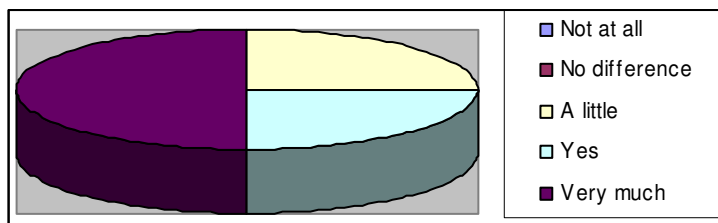
(a) Knowledge Management at Trenitalia



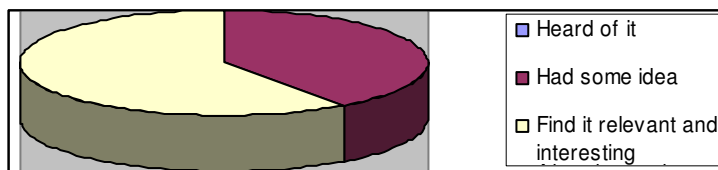
(b) New B2C services in France Telecom



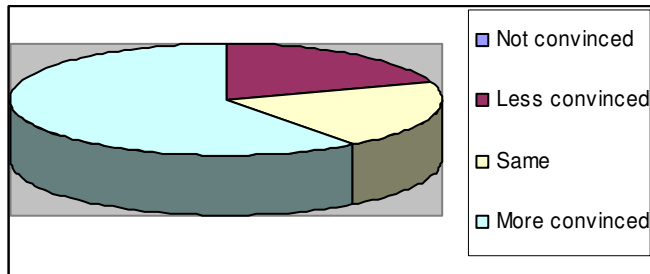
(c) Intelligent personnel recruitment



Q8. Prior to this tutorial, how would you describe the interest of your organisation in the Semantic Web?

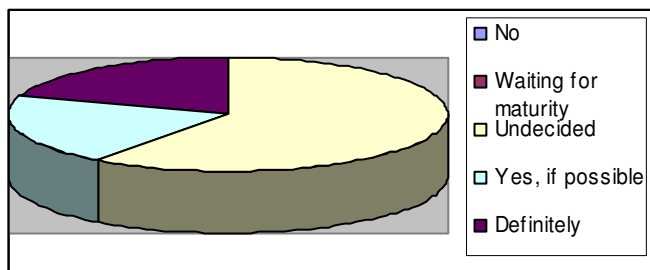


Q9. Following this tutorial, are you more or less convinced of the potential of the Semantic Web for your organisation?



Unsolicited comments: Not industry ready

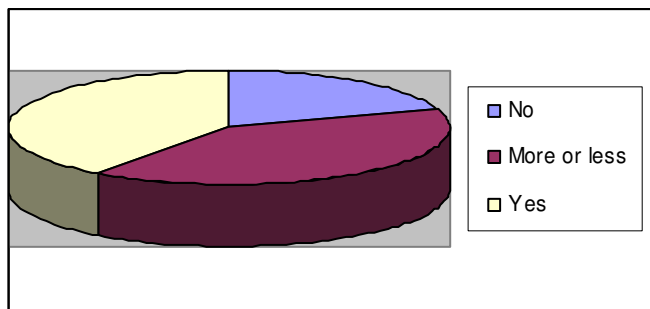
Q10. Do you plan in the next 12 months to apply Semantic Web technologies prototypically?



Q11. Where do you plan or can imagine planning to apply Semantic Web technologies?

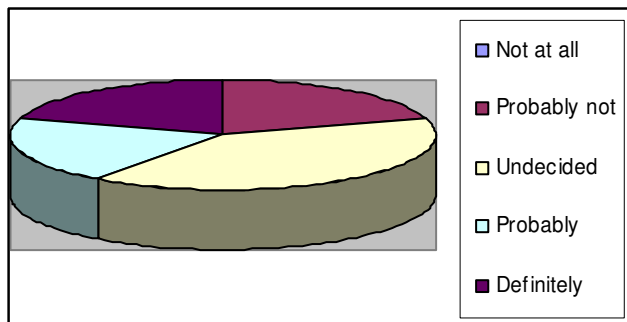
Life sciences, information retrieval, association engine, documents for maintenance of complex machines

Q12. Overall, did the tutorial meet your expectations?



Unsolicited comments: too abstract, not concrete enough

Q13. Would you be interested in a follow-up tutorial on the results of the use cases?



Q14. Any other comments?

More about concrete realisation, tools, competing technologies, timeline for future developments

4.3 Conclusion

The availability of learning materials for business professionals is a clear requirement; it is also only partially being met, as shown by the percentage of materials supplied to the REASE repository that are aimed at industry. Despite their only being uploaded onto the portal in late October (and hence no more than 7 weeks before this deliverable) the number of accesses of the XML Days materials (ranking one as the second most accessed learning unit on REASE) shows that there is a growing demand for learning materials which are aimed at industry.

The use of these materials was evaluated through two smaller events held in Berlin, Germany. In the second event we had the opportunity to collect feedback from the participants through a questionnaire. Some provisional conclusions can be drawn from the results, acknowledging of course the small sample size (5 people). However, it is positive enough to justify continuing outreach to industry with these materials.

The principal group of professionals that seems to attend such tutorials are technology consultants; maybe we can consider this group as the most likely “early adopters” who should be targeted with the intention of seeing interest in Semantic Web technologies then spread to managers (who listen to the consultants) followed by project leaders and programmers (as Semantic Web projects are initiated by management).

When questioned about the XML day tutorial, respondents were largely positive about “learning more” about the Semantic Web (Q2) but more restrained in whether it had helped them evaluate the technologies’ potential (Q3). In terms of the use cases, the B2C case from France Telecom was regarded as least relevant, possibly as it had a strong multimedia component. Knowledge Management from Trenitalia was rated in the middle, and Intelligent Personnel Recruitment was the only case to receive “Yes”/“Very Much”

responses to its relevance. Possibly this is because its focus was simpler than the Trenitalia case. In terms of suggesting the potential of Semantic Web technologies, the pattern of responses is similar except that one participant rated the B2C case higher. The recruitment case again received the most positive responses. It is worth noting that a demonstration of a prototype system was only made for this use case which most probably influenced its positive rating as business professionals clearly look for the potential of a concrete realization in the use cases.

The slides were positively regarded (Q4) though the length and tempo of their presentation received mixed views (Q5), with the consensus seeming to be that it could have been longer, given that more concrete detail was definitely desired from the participants (Q12, 14). There seems to be no real necessity for any follow up event: while no-one ruled out such an event, most were undecided (Q13). Any follow-up will certainly require to offer more concrete information on actual implementation of Semantic Web technologies in industry.

5 Future outlook

5.1 *Learning Materials*

We stress the importance of learning materials aimed specifically at industry as one of the requirements for achieving the goal of Knowledge Web which is the transfer of ontology based technologies from academia to research. The Education area can help in two ways through the provision of suitable learning materials:

- It can increase awareness and interest among the business community in the potential of Semantic Web technologies in their enterprise,
- It can support migration within enterprises to Semantic Web technologies.

We have produced some materials based on the use case activity of the Knowledge Web Industry area. This has provided us with concrete cases in which actual enterprises have identified problems and possible solutions through Semantic Web technologies. This aids the relevance of the materials to business professionals. In an evaluation these were generally positively received by the audience. However, the consensus of the participants in the tutorial was that they were expecting more concrete detail. Therefore it is clear to us that the continued co-operation with Industry activities and the Education area is timely and vital to ensure a modification of existing learning materials to be of more use and value to industry.

The present materials were generated from the first phase of use case analysis in WP1.1, which provided use cases and descriptions of potential realization. However the use cases at this stage are not concrete enough for industry. The second phase in the use case analysis which is taking place at the time of writing is to provide details of these use cases to the Research area of Knowledge Web and request concrete responses in terms of technologies, tools, methodologies and other research results which can be directly applied within the use case to realize a Semantic Web based solution. In this way actual technology transfer can take place from Semantic Web research into interested and willing Industry Board members. This transfer is expected to produce the first concrete realizations of Semantic Web application within enterprises and will clearly provide very relevant results for dissemination to the wider industry community.

Another important requirement is the wider production of learning materials for industry, aimed at a wider range of topics and requirements. We are seeing the first fruits of this in REASE, as further industry relevant learning materials have been added and other materials from other categories have been identified as industry suitable. By the end of the year 15 learning units have been categorized under “outreach to industry”, which is a substantial ratio out of a total of 60 learning units in the repository.

As progress on our present use cases in the Industry area activity continues and develops concrete transfer of Semantic Web technologies into enterprises, the experiences and success stories that will arise can be used to answer industrial needs in targeted learning

materials. In particular, the demonstration of a prototype in the intelligent personnel recruitment scenario proved very effective and it is clear that further demonstrators out of the Research and Industry areas will show to industry the maturity of the Semantic Web technologies and particularly their concrete potential in solving business problems in the real world.

5.2 Events

Two events provided a basis for the use and evaluation of targeted learning materials. As we improve upon those learning materials, expand our scope and include more concrete detail into events such as demonstrators, they will evolve into larger and broader events where we can reach more interested business professionals. However, we also recognize that the effectiveness of any event will depend on:

- The attendance of the correct target group
- The relevance of the material used for that target group

In the FU Berlin we intend to extend the original scope of the Semantic Web Info Day event to a special session on real-world Semantic Web applications. The XML Days event is also being broadened to take on a more international focus. We expect to be able to introduce some educational component aimed at business professionals into this event, though in response to the evaluation of last year's event it should be larger and more concrete (e.g. one full day with a mix of talks and demonstrations). As the first results of technology transfer are expected to be reported by June 2006, the XML Days event may be able to take advantage of this as it is scheduled to take place in September/October.

However, there are many other events and other opportunities to draw in interested members of the business community and to target them with relevant results of Semantic Web technologies solving business problems. We would like to suggest two possibilities:

- The Industry area organized an event in 2005 called "Semantic Web Days". Using the good contacts of the Industry area to the Knowledge Web Industry Board members, it drew a large number of professionals interested in Semantic Web technologies to an event in which presentations were made by industry representations about the use of Semantic Web technologies in their domain and poster sessions presented tools and Semantic Web related initiatives. The event was regarded positively and a follow-up event in 2006 would provide the Education area with an ideal venue for more advanced tutorials (since attendees are already broadly aware of the Semantic Web and are looking to learn more about its application within their specific domains of interest).
 - Venues should be identified where domain experts already meet, and where we can offer to hold Semantic Web related tutorials. These would be more introductory in nature, but would also draw upon domain specific details (e.g. examples of use cases in that domain and results).
-

5.3 Conclusion

In the course of 2005 we have recognized the importance of good learning materials aimed at the business professional community. If the Semantic Web is to be taken up by enterprises, it is vital for the research community to produce the necessary tools and methodologies and for KnowledgeWeb industrial outreach to find enterprises interested in the potential of the Semantic Web and to inform them about those tools and methodologies. Equally important however, is an educational component which fulfils two goals:

- To raise awareness among professionals about the potential of the Semantic Web, in particular demonstrating concrete results from the application of such technologies within business use cases;
- To teach companies how they can migrate to Semantic Web technologies within their enterprise systems, drawing upon real world experiences of technological transfer from academia into industry.

Educational material can be made available for personal learning, but events provide an opportunity for professionals to meet with Semantic Web experts and interact with them during and after the presentation of Semantic Web technologies and their industrial potential. These events are likely in the first place draw interested professionals, and we should provide them with the concrete details that those professionals need in order to evaluate the potential of the Semantic Web for their business. This requires targeted materials, including demonstrators which can show real world application of the technology. The next year of Industry area activity in Knowledge Web promises the first cases of actual technology transfer from research into industry. We in the Education area will continue to monitor this activity as the experiences and results from that will be useful content for a new set of learning materials in which particular use cases can demonstrate a concrete application of Semantic Web technologies to solve business problems. Being able to deliver this to business professionals is a vital first step to encouraging wider interest in and uptake of Semantic Web technologies.


References

- [1] Knowledge Web Deliverable 3.1.1, “Specification of VISWE Tasks and Goals”. Wolfgang Nejdl with contributions from Heidrun Allert, Enrico Motta and Arthur Stutt. July 2004.
- [2] <http://rease.semanticweb.org>
- [3] Knowledge Web Deliverable 3.2.1, “Initial Learning Unit Collection Description”. Heidrun Allert, Wolfgang Nejdl and Wolf Siberski. July 2004.
- [4] Knowledge Web Deliverable 3.2.3 “Report on Core Curricula in Ontology and Semantic Web”. Heidrun Allert, Jörg Diederich, Wolfgang Nejdl and Wolf Siberski. August 2004.
- [5] Knowledge Web Deliverable 1.1.2 “Prototypical Business Use Cases”. Lyndon Nixon and Malgorzata Mochol. January 2005.
- [6] Knowledge Web Deliverable 1.1.3 “Knowledge Processing Requirements Analysis”. Pavel Shvaiko. January 2005.
- [7] Knowledge Web Deliverable 1.1.4 “System and knowledge technology components for prototypical applications and business cases”. Alain Leger and Lyndon Nixon. July 2005.

Appendix A: “Perspectives for Semantic Web in Industry”



Perspektiven für Semantic Web Anwendungen in Europa

Lyndon J B Nixon
 EU NoE KnowledgeWeb
<http://knowledgeweb.semanticweb.org/o2i>




Overview of my talk

- NoE Knowledge Web
- The Industry Board
- Collection of use cases
- Some exemplary scenarios
 - Corporate knowledge management in Italy
 - New B2C services in France
- Analysis of Semantic Web application in European Industry
- Towards technology transfer and success stories







NoE Knowledge Web

- EU funded initiative with focus on realising the Semantic Web; budget approx € 7 million.
- Network of Excellence = focus on co-operation in research, support for education & transfer to industry




- 18 Semantic Web Research Institutions are members from 11 countries including




The Industry Board

- Idea of Industry Board: form a “laboratorial” target market for Semantic Web technologies
- 40 companies joined in first year
- 10 nationalities
- 12 economic sectors
 - Health, Telecom, Automotive, Energy, Food, Media, Transport, Space, Publishing, Banking, Manufacturing, and Technology
- Client industry can provide requirements and researchers can test the industrial value of their ideas







The Industry Board

Client Industry



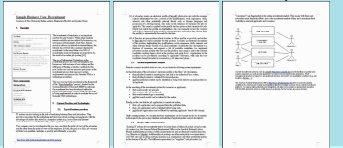
Techno-push Industry





Collection of use cases

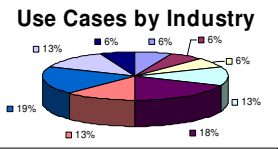
- First phase – collect industrial requirements.
- Brief questionnaire, followed up by F2F meeting
- We collected 16 use cases from 9 industry sectors









Collection of use cases

Use Cases by Industry



Industry	Percentage
Automobile	19%
Food Industry	13%
Media & Communications	6%
Service Industry	6%
Transport & Logistics	6%
Energy	13%
Government & Public Sector	6%
Pharmaceuticals & Health	6%
Technology Providers	18%



Scenario 1: Knowledge Management



Illy Caffè

This business case deals with the management of large collections of documents in Illy Caffè, in which a high level of quality and innovation in products and services are considered strategic assets.






Scenario 1 : Knowledge Management

- R&D work generates large amount of documents of different forms and from different perspectives
- Currently organising or finding knowledge in the content management system relying on personal recollection of file location or traditional search engine
- KM solutions should enable personal knowledge creation and management and promote knowledge sharing tailored to user's perspective.
- The result is better innovation!

Semantic-Web-Infotag 2005 © XML Clearinghouse

Scenario 1 : Knowledge Management


- Semantic Web solution
 - Semi-automatic document annotation
 - Use of shared conceptualisations (ontologies)
 - Concept-based search engine for more precise retrieval
- Base system: Peer-to-peer document sharing system KEEX
- Challenges
 - Developing and maintaining ontologies
 - Concept extraction / User friendly document annotation tools
 - Knowledge sharing requires negotiation & personalisation

Semantic-Web-Infotag 2005 © XML Clearinghouse

Scenario 2: New B2C Services

Online sales and information on tourist offers have become prototypes of B2C (Business to Customer) processes on the Net and make up an important part of its commercial activity.

France Telecom



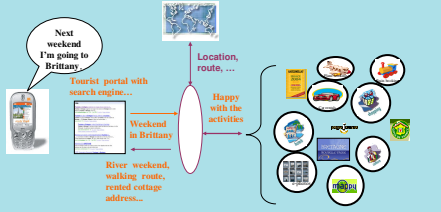
Semantic-Web-Infotag 2005 © XML Clearinghouse

Scenario 2 : New B2C Services

- Regional tourism made up of very heterogeneous resources that are not easily exploited and packaged.
- Current tourism providers offer pre-packaged deals which tend to be aimed at the "typical" customer.
- The tourism market in France is evaluated at 32 billion Euro, and river tourism has a turnover greater than 250 million Euros.
- Greater personalisation = gain in specialised market

Semantic-Web-Infotag 2005 © XML Clearinghouse

Scenario 2 : New B2C Services



Semantic-Web-Infotag 2005 © XML Clearinghouse

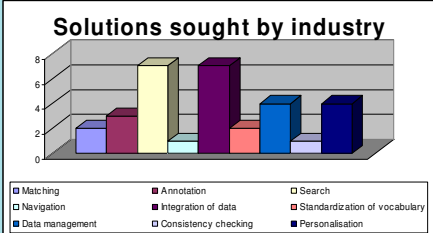
Scenario 2 : New B2C Services

- Semantic Web solution
 - Dynamic integration of content from different providers (travel, hospitality, car hire, excursions...)
 - Exploitation of knowledge e.g. geographical features, activities
 - Personalisation to user and other contexts (e.g. dates of travel)
- Base system: Existing content provider platforms
- Challenges
 - Integrating heterogeneous data
 - Brokering between different content providers
 - Composition of a meaningful tourism package

Semantic-Web-Infotag 2005 © XML Clearinghouse

Analysis

Solutions sought by industry

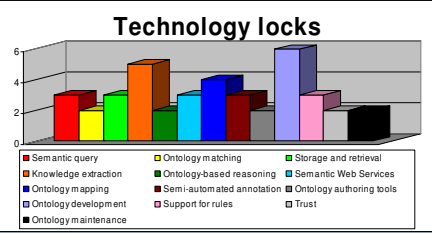


Solution	Frequency
Matching	2
Navigation	3
Data management	8
Integration of data	2
Consistency checking	8
Search	4
Standardization of vocabulary	2
Personalisation	4

Semantic-Web-Infotag 2005 © XML Clearinghouse

Analysis

Technology locks



Technology Lock	Frequency
Semantic query	3
Knowledge extraction	2
Ontology mapping	3
Ontology development	5
Ontology maintenance	2
Ontology matching	3
Ontology-based reasoning	2
Semi-automated annotation	3
Support for rules	3
Storage and retrieval	6
Semantic Web Services	3
Ontology authoring tools	3
Trust	2

Semantic-Web-Infotag 2005 © XML Clearinghouse

Analysis

- Key areas for semantic solutions are **search** and **data integration**. Industry wants to facilitate access to the knowledge it has and discover new value.
- Key challenges to industrial usage are:
 - **Development** of ontologies i.e. Modelling of business domains, authoring, best practices and guidelines, re-use of existing ontologies
 - **Knowledge extraction** i.e. The population of ontologies by finding knowledge within legacy data
 - **Mapping** i.e. Overcoming heterogeneity (use of different ontologies) by determining how one ontology can be expressed in terms of another

Towards technology transfer and success stories

- Answering the use cases
 - We are analysing what are the outstanding challenges
 - We are focusing European Semantic Web research on these challenges
 - We are facilitating the transfer of developed technologies into industry for testing and evaluation
- Generating success stories
 - Semantic Web-based industrial solutions will be collected and disseminated, raising awareness of the potential
 - Industry-strength technologies can come to market
 - Businesses benefit from the experience of early adopters and the resources and training KnowledgeWeb will provide

Thank you for your attention

For more about KnowledgeWeb's efforts
to support the industrial uptake of
Semantic Web technologies

Go to
<http://knowledgeweb.semanticweb.org/o2i>
 Or contact me at
nixon@inf.fu-berlin.de

Appendix B: Semantic Web Use Cases

Semantic Web Use Cases

Dipl.-Inf. Lyndon J B Nixon
AG NBI, FU Berlin



Overview of my talk

- What is Knowledge Web?
- Supporting Industrial Uptake of the Semantic Web
- Some exemplary scenarios
 - Knowledge management in Italian transportation
 - New B2C services in French tourism
 - Intelligent personnel recruitment (+ demo)
- Outlook for the Semantic Web in Industry
- How to benefit

What is Knowledge Web?

- EU funded initiative with focus on realising the Semantic Web.
 - budget of approx € 7 million
 - runs since January 2004 until the end of 2007
- 18 Semantic Web Research Institutions are members from 11 countries including



What is Knowledge Web?

- Built on three pillars: Research, Education and Industry

Promote transfer of Semantic Web technology to enterprise



What is Knowledge Web?

- The approach of the Industry area is:
 - Collecting **business scenarios** from Industry partners
 - **Identifying problems** in Industry that can be successfully treated with the Semantic Web **and technology locks** blocking that treatment
 - **Identifying the knowledge components** and processing mechanisms that Semantic Web applications will need
 - Ensure the **development** of those components and mechanisms by the Semantic Web research community
 - **Realising the business scenarios** in co-operation with Industry partners and so demonstrating the value of Semantic Web

Supporting industrial uptake

- Idea of Industry Board: form a "laboratorial" target market for Semantic Web technologies
- 50 companies joined to date
- 10 nationalities
- 12 economic sectors
 - Health, Telecom, Automotive, Energy, Food, Media, Transport, Space, Publishing, Banking, Manufacturing, and Technology

The Industry Board




Collection of use cases

- Provides a brief description of a concrete problem
- Used a questionnaire, followed up by F2F meeting
- We collected 16 use cases from 9 industry sectors




Collection of use cases

- Initial analysis - overview of industrial requirements
 - What type of solution does industry seek through employing Semantic Web technologies?
 - What technological locks are seen as preventing a successful employment of Semantic Web technologies?
- Results in KnowledgeWeb deliverable D1.1.2 (publicly available from knowledgeweb.semanticweb.org)

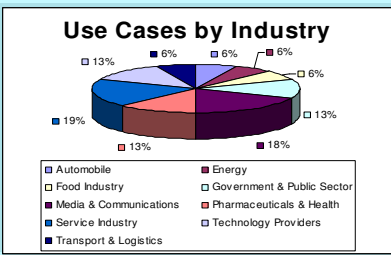

9

Collection of use cases


- Detailed analysis - typology of knowledge processing tasks and components required by industry
 - Using Unified Modeling Language (UML) to express business use case in terms of components and process
 - Identifying the location of technological locks in use case component and process stage
- Results in KnowledgeWeb deliverable D1.1.3 (publicly available from knowledgeweb.semanticweb.org)


10

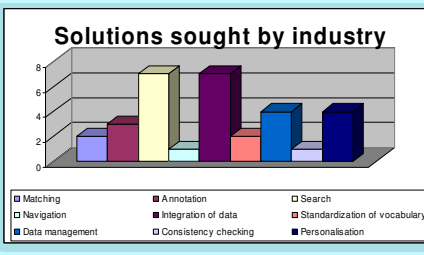
Collection of use cases




Industry	Percentage
Automobile	19%
Food Industry	13%
Media & Communications	13%
Service Industry	13%
Transport & Logistics	13%
Energy	6%
Government & Public Sector	6%
Pharmaceuticals & Health	6%
Technology Providers	6%


11

Analysis




Solution	Count
Matching	2
Navigation	3
Data management	4
Annotation	7
Integration of data	7
Consistency checking	4
Search	5
Standardization of vocabulary	5
Personalisation	5

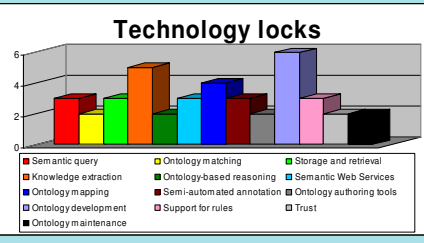

12

Analysis


- Key areas for semantic solutions are
 - search
 - data integration
- Industry wants to facilitate access to the knowledge it has and discover new value.


13

Analysis




Lock	Count
Semantic query	3
Knowledge extraction	3
Ontology mapping	3
Ontology development	3
Ontology maintenance	3
Ontology matching	4
Ontology-based reasoning	4
Semi-automated annotation	4
Support for rules	4
Storage and retrieval	5
Semantic Web Services	5
Ontology authoring tools	5
Trust	5


14

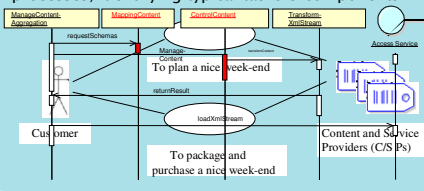
Analysis

- Key challenges to industrial usage are:
 - Development** of ontologies i.e. Modelling of business domains, authoring, best practices and guidelines, re-use of existing ontologies
 - Knowledge extraction** i.e. The population of ontologies by finding knowledge within legacy data
 - Mapping** i.e. Overcoming heterogeneity (use of different ontologies) by determining how one ontology can be expressed in terms of another


15

Analysis


- In the next phase of analysis, we use the Unified Modelling Language (UML) to model use case & its processes, identifying typical tasks & components



```

    usecaseDiagram
        actor Customer
        actor Content as Content and Service Providers (CSPs)
        usecase UC1 as requestSchemas
        usecase UC2 as Manage Content
        usecase UC3 as To plan a nice week-end
        usecase UC4 as returnPhotos
        usecase UC5 as loadContentStream
        usecase UC6 as To package and purchase a nice week-end
        usecase UC7 as Answer Services


        Customer -- UC1
        Customer -- UC2
        Customer -- UC3
        Customer -- UC4
        Customer -- UC5
        Customer -- UC6
        Content -- UC7
    
```


16

Analysis

Knowledge processing tasks	Components
Data Translation	Wrapper
Ontology Management	Ontology Manager
Matching	Match Manager
Matching Results Analysis	Match Manager
Content Annotation	Annotation Manager
Reasoning	Reasoner
Semantic Query Processing	Query Processor
Composition of Web Services	Planner
Results Reconciliation	Results Reconciler
Schema/Ontology Merging	Ontology Manager
Producing Explanations	Match Manager
Personalization	Profiler
Directory Management	Directory Manager


Most tasks repeat over cases, suggesting a **stable typology** containing core tasks stipulated by industry needs.



17

Scenario 1: Knowledge Management

Trenitalia


This business case deals with **communication and collaboration** between different groups, which is a strategic asset in medium and large organizations with **group heterogeneity**.



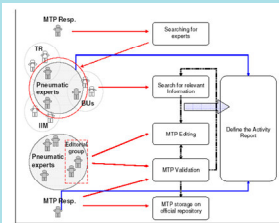

18

Scenario 1 : Knowledge Management

- In large organisations, a department can be made up of **several groups**, having different skills, **heterogeneous** in their activities, and geographically **distributed**.
- This forms a barrier to performing those organizational tasks where **collaboration and communication** is required.
- UTMR is responsible for providing rolling stock and maintaining it. One key task is the *Maintenance Technical Procedure (MTP)* writing process.



19

Scenario 1: Knowledge Management




Task of searching, merging and validating information from among design documents, maintenance techniques, estate descriptions etc.

All this information is emerging from different communities of workers: Order Managing, Research and Technology, Testing, Maintenance and Plant Engineering groups.


20

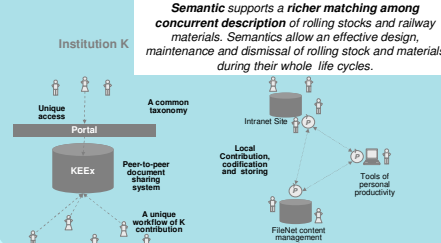
Scenario 1 : Knowledge Management


- Semantic Web solution
 - Classify documents and their content through ontologies
 - Provide different views on the same document
 - Concept-based search engine to find experts and documents
- Current system: Data repository, Access database, Intranet and a SAP system.
- Challenges
 - Developing and maintaining appropriate ontologies
 - Concept extraction / User friendly document annotation tools
 - Collaborative working tools supporting Semantic Web


21

Scenario 1: Knowledge Management

Semantic supports a richer matching among concurrent description of rolling stocks and railway materials. Semantics allow an effective design, maintenance and dismissal of rolling stock and materials during their whole life cycles.






22

Scenario 2: New B2C Services

France Telecom

Online sales and information on tourist offers have become prototypes of B2C (Business to Consumer) processes on the Net and make up an important part of its commercial activity.




23

Scenario 2 : New B2C Services

- Regional tourism made up of very **heterogeneous resources** that are not easily exploited and packaged.
- Current tourism providers offer pre-packaged deals which tend to be aimed at the "typical" customer.
- The tourism market in France is evaluated at 32 billion Euro, and river tourism has a turnover greater than 250 million Euros.
- Greater **personalisation** = gain in specialised market


24

Scenario 2 : New B2C Services

Customer

Request understanding

Semantic Best Match of customer request and profile with current offers

Selection of matching combinations

Offers

Automated Knowledge fusion

Travel Package (travel recommendations)

Knowledge fusion and summary of top Best Matches

Selected services and data resources annotated using ontologies

Next two weeks I'm going to Heraklion. Could you propose me a personalized leisure package and a concise guide in spanish?

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 2 : New B2C Services

- Semantic Web solution
 - Dynamic integration of content from different providers (travel, hospitality, car hire, excursions...)
 - Exploitation of knowledge e.g. geographical features, activities
 - Personalisation to user and other contexts (e.g. dates of travel)
- Base system: Existing, distributed and heterogeneous content provider platforms
- Challenges
 - Mediating heterogeneous data
 - Brokering between different content providers
 - Composition of a meaningful tourism package

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 2: New B2C Services

Semantics enable new types of personalised B2C services which integrate information from different sources

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 3: Personnel management

worldwidejobs

Worldwidejobs GmbH

The recruitment of employees is an important practice for any business. In 2004 almost 28% of 14-64 years old people looked for vacancies online. In the near future over 50% of recruitments made in Germany are expected to be achieved online.

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 3 : Personnel management

- Online repositories such as JobPilot or the Arbeitsagentur provide for the publication and discovery of job postings and applicants.
- Online job market is **fragmented** and search is text-based, leading to **inefficiencies** in the association between vacancies and candidates.
- Finding the best suited candidate in the fastest time can lead to **cost cutting** and **sparing resources**.

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 3 : Personnel management

Job Portal

Employer: Job Posting annotated using controlled vocabularies

Applicant: Recommended open positions

Automated Preselection

Applicant: Job Application annotated using controlled vocabularies

Employer: Interview Recommendations

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 3 : Personnel management

- Semantic Web solution
 - Semantic annotation of both candidates and vacancies
 - Semantic matching between requirements and offers
 - Ranking by relevance
- Base system: Current job portals use XML or RDBMS for back end storage
- Challenges
 - Extracting semantic information out of existing sources
 - Maintenance of ontologies as job market changes
 - Security and trust

Berlin XML Tage 2005 © XML Clearinghouse

Scenario 3: Personnel management

*** Demo of intelligent personnel management***

Information Consumers

Information Integration + Matching

Semantic Portal

Semantic Matching Engine

Classifier

RDF Repository

Information Providers

Net API

RDF Repository

RDF-annotated Websites

Net API Wrapper

Non-RDF HR System

Berlin XML Tage 2005 © XML Clearinghouse

Outlook for Semantic Web in industry

• Answering the use cases

- We are analysing the **outstanding challenges** in the industrial use cases
- We are focusing European Semantic Web **research** on these challenges
- We are facilitating the **transfer** of developed technologies into industry for testing and evaluation

Outlook for Semantic Web in industry

• Generating success stories

- Semantic Web-based industrial solutions will be collected and **disseminated**, raising awareness of the potential
- Industry-strength technologies can **come to market**
- Businesses benefit from the experience of early adopters and the **resources and training** KnowledgeWeb will provide

Outlook for Semantic Web in industry

• Summary

- Collected use cases are of course a small sample of industrial interest in Semantic Web but act as **prototypical**
- We will be able to issue **guidelines** for the use of Semantic Web as a solution to typical business problems
- Experiences of application as well as the resulting tools and methodologies are expected to have **wide re-use** possibilities across industry

How to benefit

To benefit from KnowledgeWeb's efforts to support the industrial uptake of Semantic Web technologies, check the web page and consider participation in the Industry Board.

Go to

<http://knowledgeweb.semanticweb.org/o2i>

or contact me at

nixon@inf.fu-berlin.de

Thank you for your attention

Please fill out the questionnaire – we need your feedback to this tutorial!

Thanks for content and comments:

- Alain Leger, Francois Paulus (France Telecom)
- Pavel Shvaiko, Roberta Cuel (Uni Trento)
- Malgorzata Mochol, Klaus Schild, Robert Tolksdorf (FU Berlin)