Networking of universities of the applied science with small and medium size enterprises “New Application of semantic systems”

Rene Deplanque
You know everything is getting more and more complex and confusing:

I still remember the good old times where everything was so easy and clear-cut. This was last December but now is March 2008 and 4 months are 4 months.

NFAIS Presenter quoting a computer expert
Two Monologues

Scientist: Do you have problem.
Engineer: Yes, we have those ceramics which always break.
Scientist: Marvelous, can I have some.
Engineer: Yes of course we have piles of those. Take as much as you like.

Two years go by

Scientist: Finally, we found out why your ceramics broke! Do you want to know why?
Engineer: Fine

After a long monolog:

Scientist: And what are you going to do with our result?
Engineer: Nothing
Scientist: Why not?
Engineer: We do not use those ceramics any more, they always broke.
Then a Miracle Occurs...

“I think you should be more explicit here in step two.”

from *What’s so Funny about Science?* by Sidney Harris (1977)
Scientific American Article notes

[Joint starting place:]

I. Semantic Web Vision (TBL)

II. What are the enablers? (in sequence)
   Screen Scraping (Ora and TBL)
   Data on Web (Ora and TBL)
   Zip code link between Data Bases (TBL)
   Ontology Independence (JAH)

   Effect of Scale (TBL)

   “Then, a miracle occurs”

III. What can you do with it? (not necessarily in sequence)
    Self-describing documents  (JAH)
    Logic to encode... (TBL)
    Services and Advertising (Ora)
    Devices (Ora)
    Digital Signatures, Authentication, and Trust (TBL)
Semantic Web vs. “Web 2.0”

- Data with formal semantics
  - RDF, OWL
  - SPARQL, RIF
- Spontaneous information integration
- Semantic Web services, agents
- Strong emphasis on open standards

- New social phenomena: blogs, wikis, tagging, folksonomies
- New user interfaces
  - AJAX (or: “Rich User Experience”)
- “New” kinds of data
  - microformats, RSS
  - “mash-ups”
  - Web services
- Plays “fast & loose” with standards
Web-based social networks

A little **Semantics** goes a long way

Data harvesting & visualization

Rich metadata

Web-based social networks
Considerable synergies exist.
Mash-Ups

„Combine various contents of various sources“
- Craigs List: Google Maps and Property advertisements
- Programmableweb.com: 1535 web-APIs

- Amazon
- Delicious
- Flickr
- Google
- GoogleMaps
- Technorati
- Yahoo
- YouTube

ProgrammableWeb.com 02/12/07

Max Völkel FZI voelkel@fzi.de
Mash-Up: Example

- Max Völkel FZI voelkel@fzi.de
Aristotle’s Ontology: A Systematik Deskription of Existenz

- 384-322 BC
- „Gaining knowledge about something“

„Categories“
- Substance
- Quantity
- Quality
- Relation
- Place
- Time
- Situation
- Condition
- Action
- Affection
Ontology's: Bridges crossing three worlds

Molecular Biology
Domain Objects

Computer Science
Representation Manipulation

Mol. Biol.-Ontology

Semantics

Philosophy Linguistics
Upper Level of Cyc Ontology

www.cyc.com
Upper Level
μKosmos Ontology
What do we need

- A system that can show
- A system that can search
- A system that can present
- A system that can understand.
- A system that can guide
- A system that knows my needs

- A system which is my best buddy and organizes my community and my friends and everything.
In the course of an advancement by program and reorientation of the advancement program running since 1992 the Federal Ministry for education and research (BMBF) with the advertisement carries out application orientated research and development at colleges of further education (eFUe) for the promotion year 2004 a shift of emphasis of its promotion activity for the support of economics regional research groups at colleges of further education (FHi). This reorientation of the promote-political objectives aims at a stronger interdisciplinary and universalspreading co-operation of FHi, with this with partners from the economy (preferably KMU), to which science (research establishments, universities) and partners from other ranges cooperate. This settles also in the new program name: Applied research at colleges of further education in the group with the economy (FHi).
Index: IAF emphasis

(Intelligent) measuring systems and sensor technologies • (2)
Rural economy • (1)
Acoustics and noise reduction • (1)
Applied computer science and geo computer science • (1)
Applied social research • (1)
Architecture and organization • (1)
Audiology • (1)
Audiovisual, digital and interactive media • (1)
Automatic control engineering • (2)
Automotive Competence center (ACC) • (1)
Building, environmental and process engineering • (1)
Building technology • (1)
Image processing • (1)
Bio analytics • (1)
Bio mechanics • (1)
Biomedical technology • (1)
Computer Aided Design/Manufacturing (CAD/CAM) • (1)
Digital printing • (1)
E-Business Application and information systems • (1)
Empirical economic research • (1)
Energieeffizientes tarpauline, building and operation of buildings and their
equipment technology • (1)
Energy transformation in solar systems • (1)
Manufacturing of medicine products • (1)
Geo computer science • (1)
Globalization/business partner Asia • (1)
Boundary surface analytics and surface technique • (1)
Heart and cycle diagnostics • (1)
Engineer computer science/application orientated software technologies • (1)
Institut for applied child media research (Ifak) • (1)
Intelligent systems • (1)
Clinical physiology of the respiration • (1)
Colloid systems • (1)
Landscape and environmental planning • (1)
Laser-based measuring and diagnostic technology • (1)
Mechatronik • (1)
Mechatronik • (1)
Medically oriented biotechnology • (1)
Medical didactics • (1)
Medical instrument technique • (1)
Medical technology • (1)
Microprocessing in • (1)
Forschungslandschaft Fachhochschulen

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und Korrosion. Andererseits schließen sie auch die Herstellung und Verarbeitung der Werkstoffe mit ein. Die einzelnen Arbeitsgebiete sind entsprechend strukturiert. Professor Gümpel forscht auf dem Gebiet der metallischen Werkstoffe, Professor Manz über Kunststofftechnik und Professor Vogt über Isolierwerkstoffe. Im Institut für Optische Systeme widmen sich die Professoren Claus Braxmaier, Matthias Franz etc.

Aktuelles, Termine (2) 5120news://FIZ CHEMIE/15702 2008-03-12 16:31:26
dazugehörigen Prozesseitständen. Hiermit lassen sich sowohl die Funktionsweise eines Kraftwerks, wie auch mehrerer Industrieprozesse nachbilden. So stehen Abläufe aus den Branchen Chemie, Pharmazie und Metall, aber auch beispielsweise eine Applikation für eine Brauerei zur Verfügung. Alle Prozesse werden dabei nicht innerhalb der speicherpunktfreien Steuerung sondern wahlweise auch als sogenannte...

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Emerging Trends

- **Semantic Web Services**
  - crucial for linking “programs” into the mix
  - “plumbing” for agents...

- **Scaling Semantic Web stores to database sizes**

- **Information extraction and semantics ("Web 3.0")**
  - can we “retrofit” semantics on the existing Web?

- **Semantic Web information creation**
  - can we make it so we don't have to retrofit in the future?
    - tools that help embed the semantics as a document is created
    - better dynamic integration of structured data into the Semantic Web
  - “Semantic Desktop”
Significant Corporate Activity

- Semantic (Web) technology companies starting & growing
  - Joost, Radar Networks, MetaWeb, Siderean, SandPiper, SiberLogic, Ontology Works, Intellidimension, Intellisophic, TopQuadrant, Data Grid, ...

- Bigger players buying in
  - Adobe, Cisco, HP, IBM, Microsoft, Nokia, Oracle, Sun, Vodaphone... announcements/use in 2006–2007
  - integrator and contractor uptake: Northrop Grumman buys Tucana, Lockheed–Martin uses SiberLogic in FCS, WebMethods buys Cerebra, ...
  - tools being announced: AllegroGraph, TopBraid, ...

- Government projects in and across agencies
  - US, EU, Japan, Korea, China, ...

- Life sciences/pharma an increasingly important market
  - Health Care and Life Sciences Interest Group at W3C

- Many open source tools available
  - Kowari, RDFLib, Jena, Sesame, Protégé, SWOOP, Onto(xxx), Wilbur, ...
Today Joe Weizenbaum's ELIZA-simulates a human psychotherapist.
Where are we in reality??  We are here

Where do we go: forward
Where will we end up: no idea
Is there a prognosis? Yes
(see me after this session)

- Forget the technologies
- There are 8000 computer languages and only 6000 human languages.
- The computer influences to a large extent our social interaction and society.
- George Orwell was really naive.
- Where we are tomorrow time will tell

- Is it good or bad: NO IDEA that is bad
- But do not stay naïve, that is the worst
Questions & Discussion
And finally

I like to thank all those unknown Ladies and Gentlemen who put there fantastic presentations into the Net and so enabling me to prepare this talk without months and months of laborious overhead design.
Semantic Web vs. “Web 2.0”

- Data with formal semantics
  - RDF, OWL
  - SPARQL, RIF
- Spontaneous information integration (finally!)
- Semantic Web services, agents
- Strong emphasis on open standards

- New social phenomena: blogs, wikis, tagging, folksonomies
- New user interfaces
  - AJAX (or: “Rich User Experience”)
- “New” kinds of data
  - microformats, RSS
  - ”mash-ups”
  - Web services
- Plays “fast & loose” with standards
2000–2001: What Did We Believe?

- Ora: Semantic Web and the advent of pervasive computing (June 1999)

- Ora: Roadmap from the “old” Web to the Semantic Web (October 2001)
50+ Semantic Web press releases within one month!
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1. Yahoo Pipes
2. Semantic Web
## Semantic Web + Web 2.0 = Web 3.0?

<table>
<thead>
<tr>
<th></th>
<th>Web 2.0</th>
<th>Web 3.0</th>
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<tbody>
<tr>
<td><strong>Tagging</strong></td>
<td>- annotieren mit <em>ambigen</em> Stichwörtern</td>
<td>- annotieren mit <em>eindeutigen</em> Stichwörtern</td>
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<tr>
<td></td>
<td>- Singular/Plural-Problem</td>
<td>- Inferenz (Tag „Hund“ folgt Tag „Tier“)</td>
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<td></td>
<td>- Synonyme</td>
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<td>- Keinerlei Intelligenz</td>
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<tr>
<td><strong>Rekombination von Daten verschiedener Quellen</strong></td>
<td>- Mesh-Ups vorab von Hand programmiiert</td>
<td>- Spontan durch End-Nutzer (siehe Piggybank)</td>
</tr>
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<td><strong>Suche</strong></td>
<td>- Stichwortsuche oder Tag-Suche <em>findet</em> Dokumente</td>
<td>- Strukturierte Suche kombiniert Daten und <em>erzeugt</em> Dokumente</td>
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