What Does Sparkling Wine Have To Do With Semantics?

York Sure

Institute AIFB, University of Karlsruhe

Talk @ Ontolog Community of Practice

Thursday, August 17th, 2006

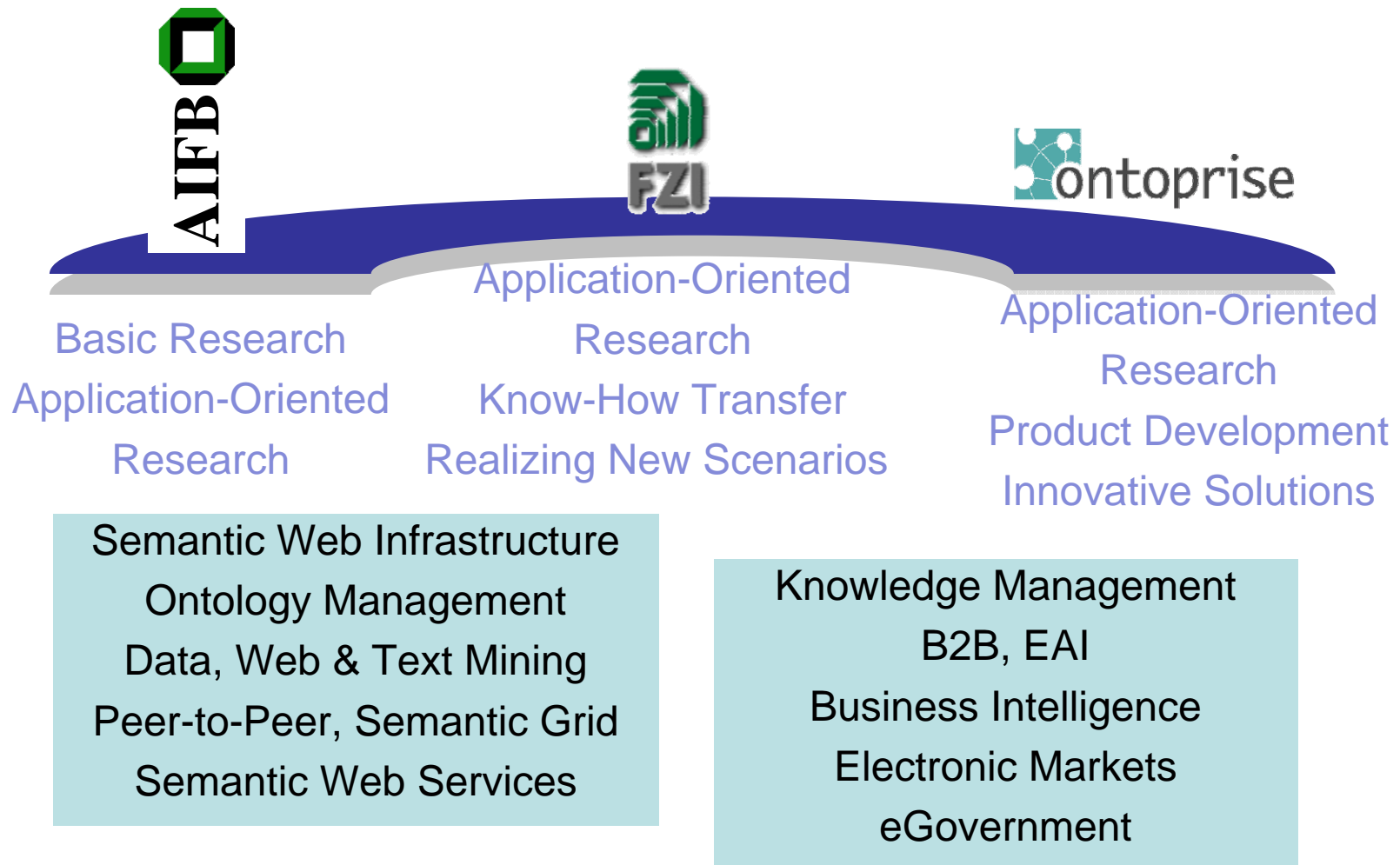# *Where do I come from? It's ...*

<swrc:nice_place>

</swrc:nice_place>

„Semantic Karlsruhe" ;-)

Karlsruhe: Location for Semantic Technologies and Applications

Basic Research
Application-Oriented Research

Application-Oriented Research
Know-How Transfer
Realizing New Scenarios

Application-Oriented Research
Product Development
Innovative Solutions

Semantic Web Infrastructure
Ontology Management
Data, Web & Text Mining
Peer-to-Peer, Semantic Grid
Semantic Web Services

Knowledge Management
B2B, EAI
Business Intelligence
Electronic Markets
eGovernment

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Karlsruhe: Education

Grad-Level Courses

– Intelligent Systems in WWW – Semantic Web

– Knowledge Management

– Knowledge Discovery and Text Mining

Seminar Courses

– Knowledge Portals

– Semantic Web Services

– Semantic Grid

Sparkling Wine and Semantics

http://en.wikipedia.org/wiki/Sekt

Sekt
From Wikipedia, the free encyclopedia
Jump to: navigation, search

For the EU research project, see SEKT

Sekt is the German term for sparkling wine. Germany is the largest per capita consumer of sparkling wine in the world. Sekt may be made by the same method as Champagne or by the tank method. Historically much sekt was made at least partially from imported grapes; it can only be labelled as *Deutscher Sekt* if it is made exclusively from German grapes. Some very good examples are made, often using the riesling grape, but much of it is inexpensive and drunk locally rather than exported.

Karlsruhe: Selected
EU Semantic Web Projects

SEKT: Semantically-enabled Knowledge Technologies
– €12M, 11 European partners, 3 year project, 2004–2006
– http://www.sekt-project.org/

Knowledge Web
– €8M, 18 European partners, 4 year project, 2004–2007
– http://knowledgeweb.semanticweb.org/

DIP: Data, Information, and Process Integration with Semantic Web Services
– €16M, 17 European partners, 3 year project, 2004–2006
– http://dip.semanticweb.org/

X-Media: Knowledge Sharing and Reuse across Media
– €13M, 15 European partners, 4 year project, 2006–2010
– http://nlp.shef.ac.uk/X-Media/index.html

NeOn: Networked Ontologies
– €10M, 14 European partners, 4 year project, 2006–2010
– http://www.neon-project.org/

Agenda

- SEKT Project Overview
- Methodology Bubbles
- Technology Bubbles
- Conclusion

SEKT Overview

- **"Semantically Enabled Knowledge Technologies"**
  - Integrated Project in EU 6th FP
  - Start 01/2004
  - Duration 3 years

- **Industry: British Telecom (Coordinator)**, Empolis, Ontoprise, iSOCO, Sirma AI, Kea-pro

- **Academic: U of Karlsruhe (Technical Coordinator)**, U of Sheffield, JSI/Ljubljana, U of Amsterdam, U of Innsbruck, U of Barcelona

SEKT Overview

- **Main goals** of SEKT
  - European **Leadership** in Semantic Technologies
  - **Research**: Combine Human Language Technologies, Knowledge Discovery and Ontology Technologies
  - **Application**: Provide intelligent knowledge access

- **University of Karlsruhe**
  - Ontology Lifecycle Management
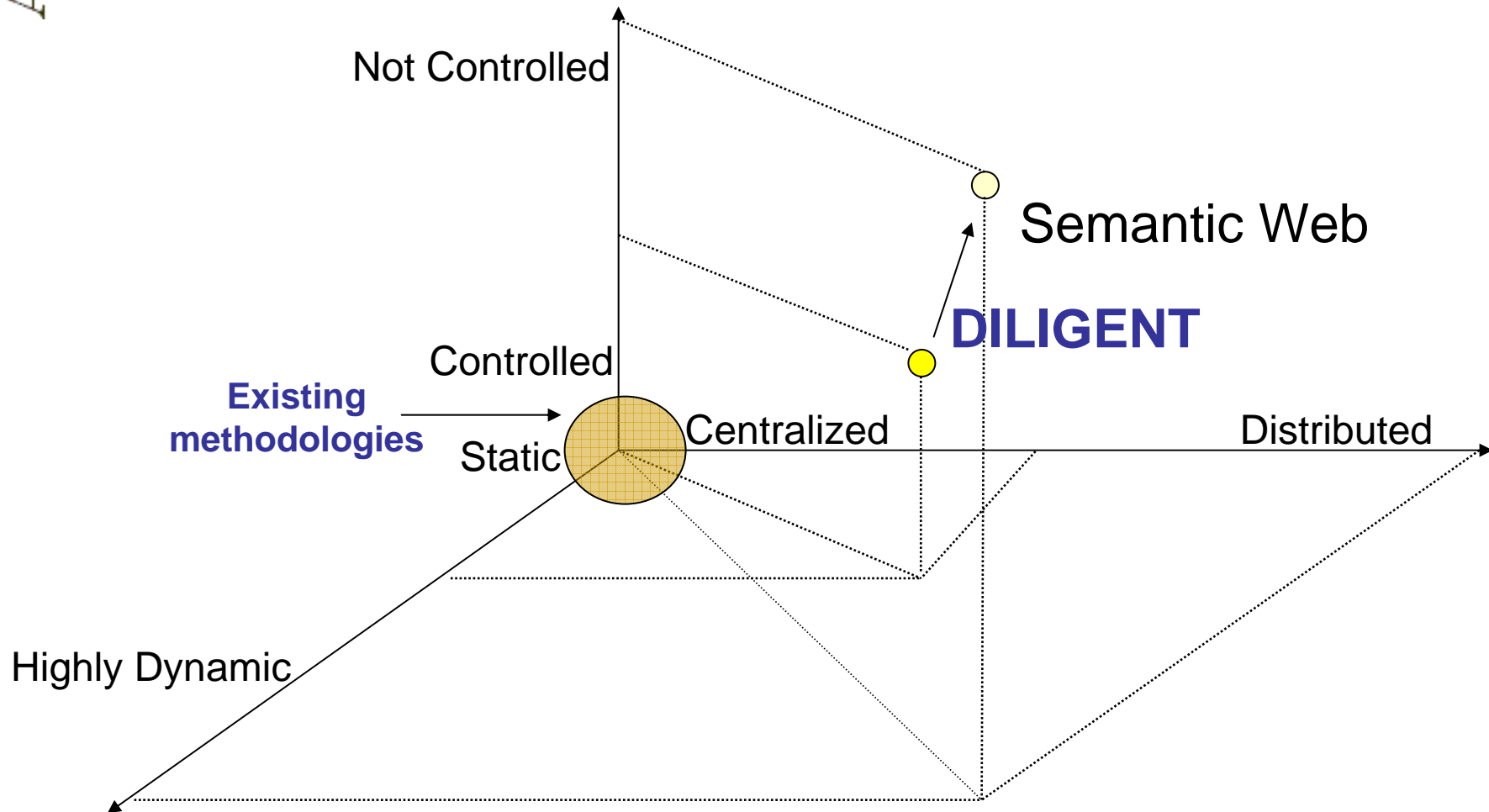 - Methodology

Agenda

- Overview SEKT Project
- **Methodology Bubbles**
  - **DILIGENT**
  - **Argumentation Support**
- Technology Bubbles
- Conclusion

Review of Ontology Engineering

- **Building Ontologies from scratch:**
  - Fairly understood process + lifecycle, usually manual
  - Several mature methodologies
  - Diversified team (together): domain experts + ontology experts

- **Ontology engineering is changing:**
  - Quite **distributed** (SW)
    - Not necessarily meet often or easily
  - Partial **autonomy**
    - Modify/personalize locally
  - **Iteration**
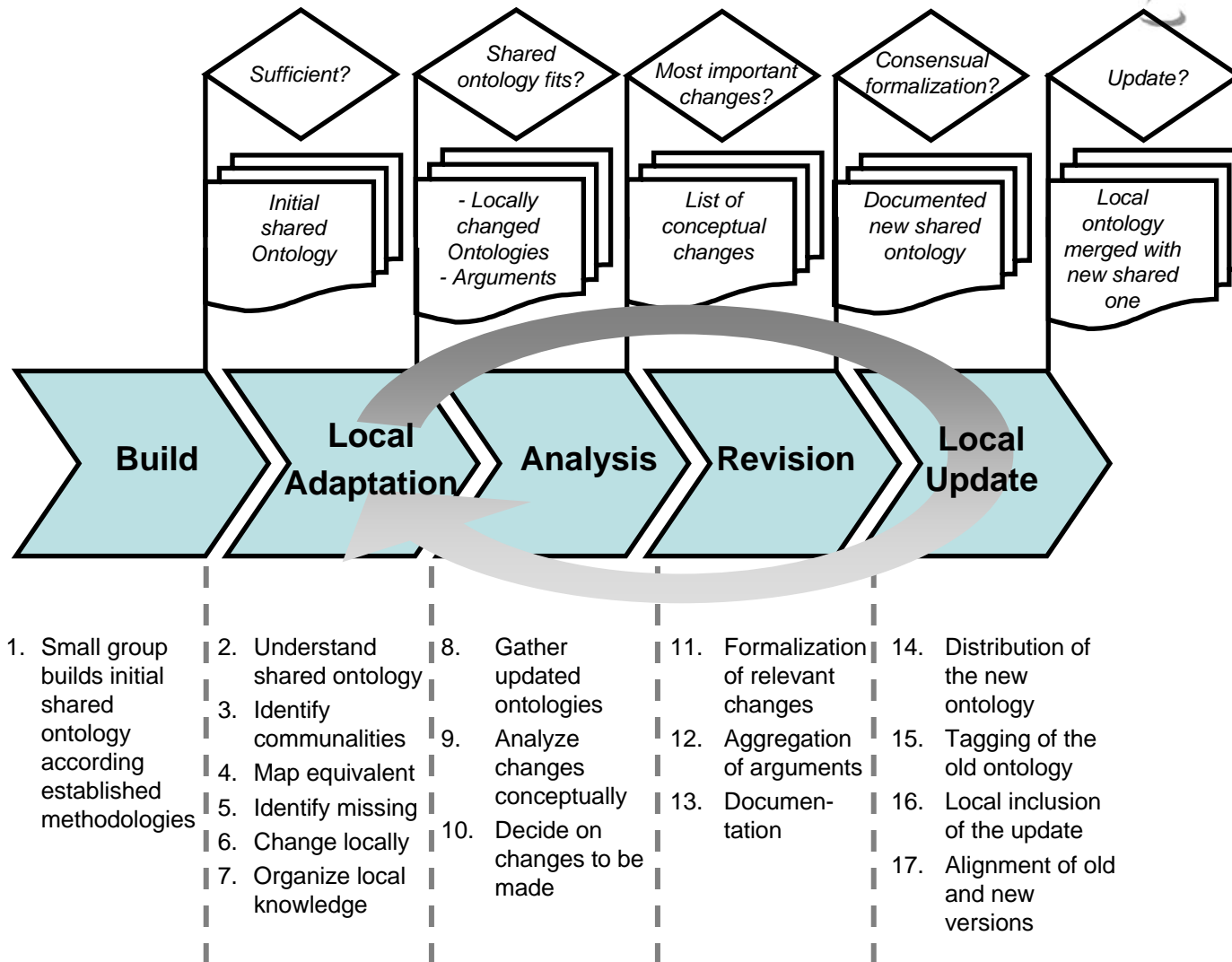   - Need for interleaving construction and use

Where is the Research

Not Controlled

Semantic Web

DILIGENT

Controlled

Existing methodologies

Centralized

Static

Distributed

Highly Dynamic

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DILIGENT

- **DI**stributed
- **L**oosely-controlled
- evolv**I**n**G**
- **E**ngineering of o**NT**ologies

- Includes:
  - Detailed Process Model
  - Argumentation Support for Discussions
  - Cost Estimation for Ontologies

DILIGENT Process

1. Build

2. Local adaptation

5. Local Update

3. Analysis

4. Revision

Ontology user

Domain Expert

O-Engineer

Knowledge Engineer

O_l

O_1

O_n

O-User 1

…

O-User n

Control Board Editors

DILIGENT Process

Sufficient?	Shared ontology fits?	Most important changes?	Consensual formalization?	Update?
Initial shared Ontology	- Locally changed Ontologies - Arguments	List of conceptual changes	Documented new shared ontology	Local ontology merged with new shared one

Build	Local Adaptation	Analysis	Revision	Local Update

1. Small group builds initial shared ontology according established methodologies

2. Understand shared ontology
3. Identify communalities
4. Map equivalent
5. Identify missing
6. Change locally
7. Organize local knowledge

8. Gather updated ontologies
9. Analyze changes conceptually
10. Decide on changes to be made

11. Formalization of relevant changes
12. Aggregation of arguments
13. Documen-tation

14. Distribution of the new ontology
15. Tagging of the old ontology
16. Local inclusion of the update
17. Alignment of old and new versions

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Following an Ontology Engineering Discussion

Von:	sekt-wp5-bounces@aifb.uni-karlsruhe.de im Auftrag von Atanas Kiryakov [naso@sirma.bg]
An:	Denny Vrandecic; Hamish Cunningham
Cc:	sekt-wp1@aifb.uni-karlsruhe.de; studer @aifb.uni-karlsruhe.de; Ralph.Traphoener@empolis.com; mitac@sirma.gb; sekt-wp5@aifb.uni-karlsruhe.de; mario.lenz@empolis.com
Betreff:	Re: [Sekt-wp5] Re: ontology discussion

Gesendet: Di 07.12.2004 19:0

```
> 4. got:subRegionOf is a owl:TransitiveProperty. In your example on p. 21
> you say, that "Diego Garcia" is a MilitaryBase located in the Indian
> Ocean, an that...
>
> "Diego Garcia" got:subRegionOf "USA"
> "USA" got:subRegionOf "North America"
>
> Now you can infer that
> "Diego Garcia" got:subRegionOf "North America"
> which actually would be wrong.
> Either it's the example or the underlying relations, but there's a mistake
> in there.

obviously, we do not model this  properly. To make it work better:
- there should be distinction between administrativeSubRegionOf and
spatialSubRegionOf
- the two should be transitive sub-properties of subRegionOf
- subRegionOf should not be transitive, probably also the general partOf
relation

this only one demonstration on how it gets more complex and less intuitive
when you try to cover everything correctly

I would leave this for future fixes, because it requires redesign of a
considerable part of the ontology and has implications on instance data
which is currently in use
```

Following an Ontology Engineering Discussion

```
> 4. got:subRegionOf is a owl:TransitiveProperty. In your example on p. 21
> you say, that "Diego Garcia" is a MilitaryBase located in the Indian
> Ocean, an that...
>
> "Diego Garcia" got:subRegionOf "USA"
> "USA" got:subRegionOf "North America"
```

This is wrong!

Kiryakov [naso@sirma.bg]   Gesendet: Di 07.12.2004 19:05

Ralph.Traphoener@empolis.com; mitac@sirma.gb; sekt-wp5@aifb.uni-karlsruhe.de;

mario.lenz@empolis.com
Betreff: Re: [Sekt-wp5] Re: ontology discussion

Answer:
Yes, but in our context
sufficient.

```
- subRegionOf should not be transitive, probably also the general partOf
relation
```

Requirements for Argumentation Support

1. ## Common vocabulary
   (IBIS; Compendium)

2. ## Relevant arguments
   (eg. example; counter example; justification)

3. ## Ontology focus
   (conceptual vs. formalization)

4. ## Adaptivity
   (manual vs. automated provision of arguments)

5. ## Support entire argumentation
   (decisions; positions; …)

IBIS: Issue Based Information Systems

- Conceptual model to represent arbitrary Arguments in DILIGENT:

  - **Issue**
    - Requirement on the Ontology
    - What should be represented with the ontology?

  - **Idea**
    - Solution on the conceptual level
    - How should an Issue be modeled?

  - **Argument**
    - Argument in favor or against an Issue or Idea?
    - Give Examples or Evaluations in favor of the Issue or Idea
    - Give Counter Examples or Alternatives to challenge the Issue or Idea

Argumentation Ontology: IBIS

- Argumentation ontology defined

- Allows an integrated view on arguments from humans as well as machines

- *This is just a snippet …*

arguonto:Issue

raisedIssue :
              rdfs:Literal

arguonto:Idea

arguonto: Argument

arguonto: responsesToIssue

arguonto:argumentsOn   1..*

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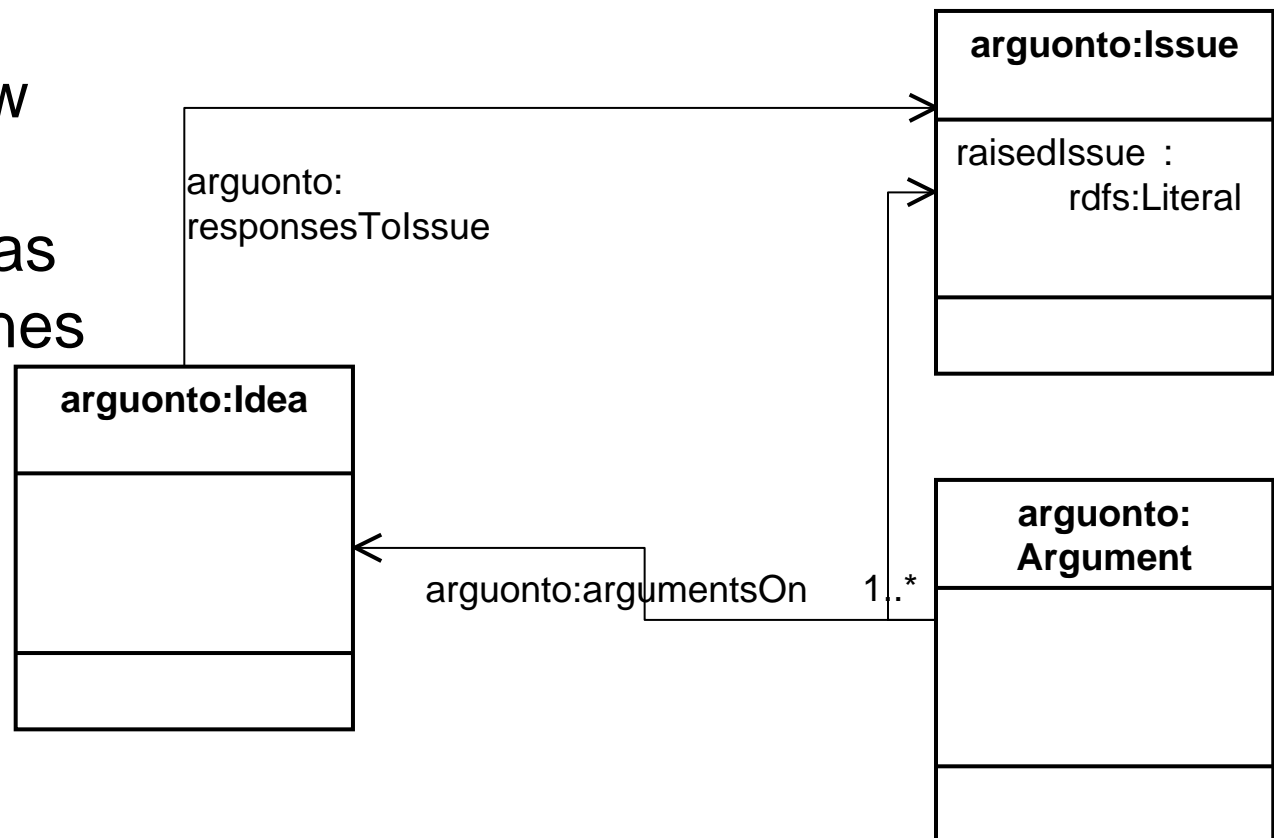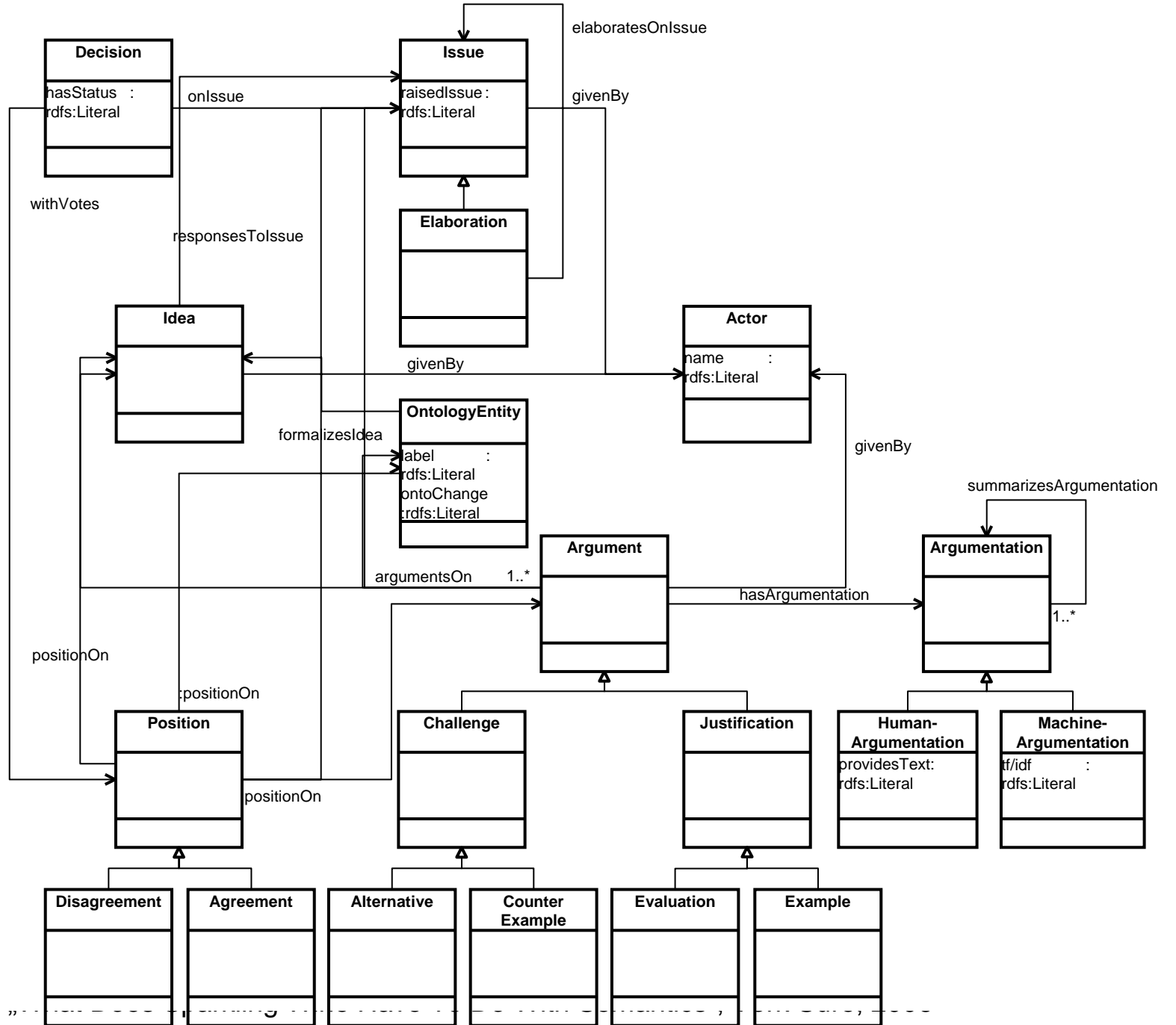
Argumentation Ontology Example
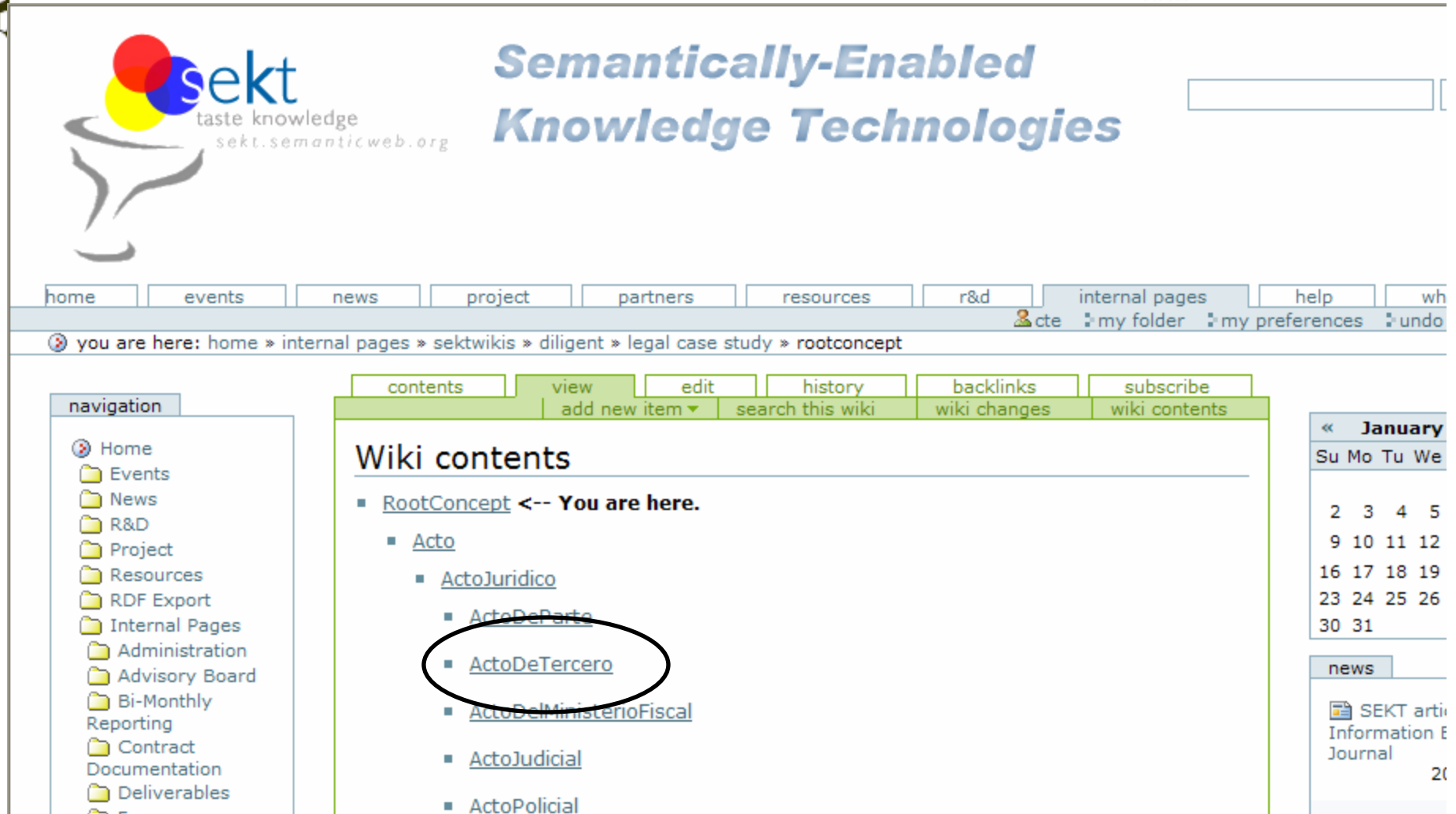
- **Issue**: Need for sub region inclusion into regions

- **Idea**: Model the "subregion" property as "owl:TransitiveProperty"

- **Argument** (Counter Example): "Diego Garcia" is not a sub region of "Great Britain", but still a part of "Great Britain"

- **Position** (Disagree) - position on - Argument: "For our context it is sufficient"

Argumentation: Tool Support

- Wiki tool support to discuss ontology design decisions
  - Arguments can be provided by all participants of the project
  - Arguments are traceable
  - The discussion is structured
  - Agreement process is reproducible

Screenshots

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Screenshots

Agenda

- SEKT Project Overview
- Methodology Bubbles
- **Technology Bubbles**
  - **KAON2**
  - **Semantic MediaWiki**
- Conclusion

KAON2: OWL+SWRL +F-Logic Reasoning

- *For a long time:*
  "Logic Programming (LP) *OR* Description Logic (DL)"
- *Today:*
  "Logic Programming *AND* Description Logic"

- **KAON2** ontology infrastructure
  - **New:** Reasoning based on reduction of SHIQ(D) knowledge bases (DL) to disjunctive datalog programs (LP)
  - Managing **OWL-DL** and **SWRL** (DL) as well as **F-Logic** (LP) **at the same time**
  - Efficient A-Box reasoning

- **Major improvement in reasoning theory and practice**

- http://kaon2.semanticweb.org/

Semantic MediaWiki

- MediaWiki used for **Wikipedia**
- Semantic MediaWiki introduces some **additional markup** into the wiki-text which allows users to add "semantic annotations".

- Structured Knowledge Representation (with RDF export)
- Extensions
  - for *typed* **Links**
    - Previously: … Karlsruhe is located in [[Germany]] …
    - New: … Karlsruhe is located in [[LocatedIn::Germany]] …
  - for **Annotations**
    - Previously: … Karlsruhe has 280.000 inhabitants …
    - New: … Karlsruhe has [[Inhabitants:=280000]] …

Persons - mySMW - Mozilla Firefox

Datei   Bearbeiten   Ansicht   Gehe   Lesezeichen   Extras   Hilfe

http://localhost:8080/mySMW/index.php?title=Persons&action=purge   Go

Webmail   mySMW   LIO-Wiki   WIWI: Hardware-Res...   School of Medicine Wi...   IBM   IBM Research | Alma...   Tractable Fragments ...   »

Persons - mySMW

127.0.0.1

article   discussion   edit   history

Persons

Category:Persons

	Affiliation	**Projects**
Alexander Loeser	IBM Almaden Research Center	Avatar Semanti
David Martin	SRI	
Grit Denker	SRI	
Laura Haas	IBM Almaden Research Center	
Mark Musen	SMI	
Michael Maximilien	IBM Almaden Research Center	
Oscar Corcho	University of Manchester	
Peter P. Yim	Ontolog	
Rudi Studer	AIFB University of Karlsruhe	
Shivakumar Vaithyanathan	IBM Almaden Research Center	Avatar Semantic Search
Vinay Chaudhri	SRI	CALO
York Sure	AIFB University of Karlsruhe	Knowledge Web SEKT

Do you think that items on this page are out of date? You can clean its cache to manually update all dynamic parts to the latest data from the wiki.
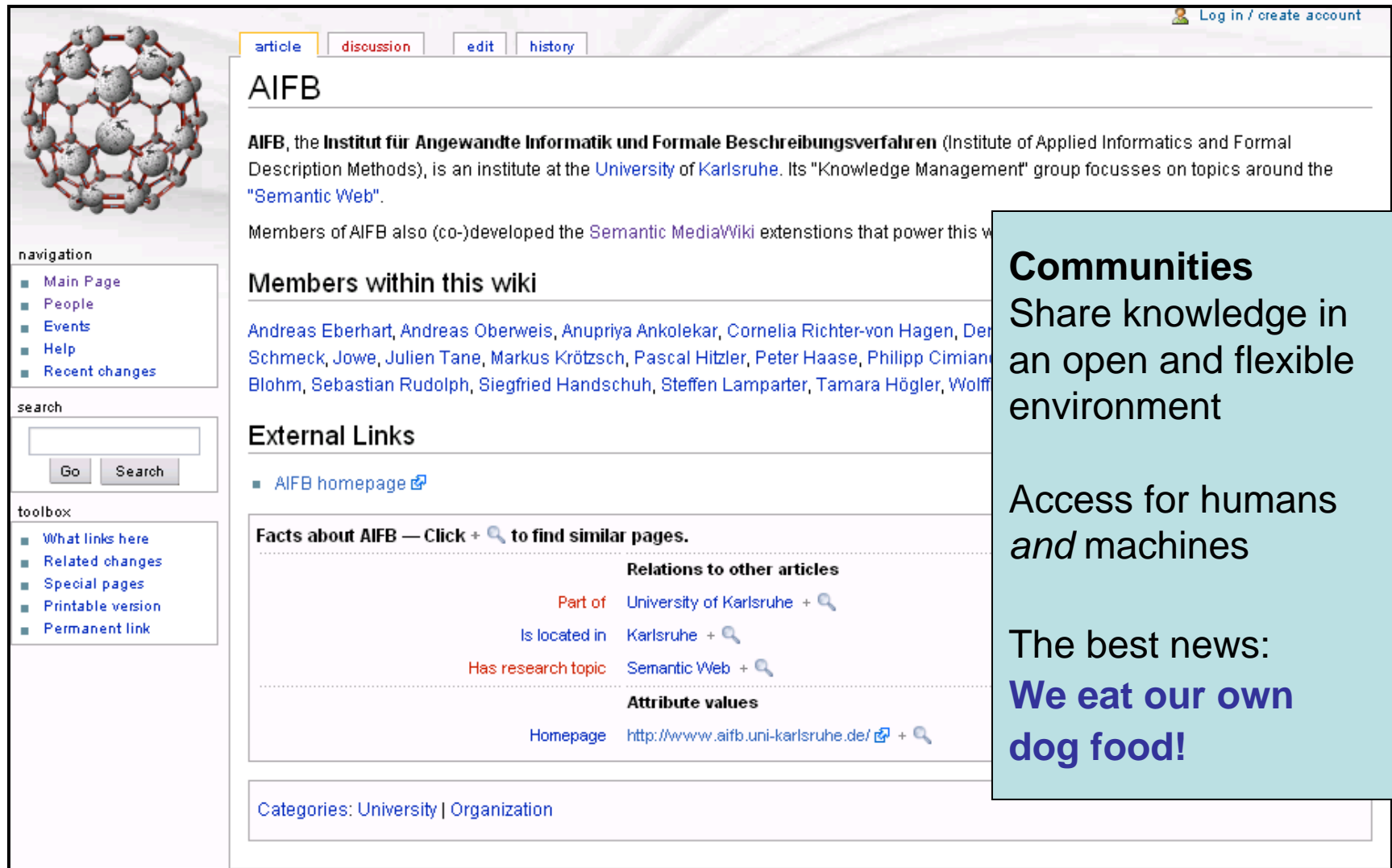
navigation
- Main Page
- Minutes
- Persons
- Recent changes
- Help

search

Go   Search

toolbox
- What links here
- Related changes
- Special pages
- Printable version
- Permanent link

<ask>
  [[Category:Persons]]
  [[affiliation:*]]
  [[works for project::*]]
</ask>

Personal Knowledge Management
e.g. create lists
out of annotated
minutes and notes

Communities
Share knowledge in an open and flexible environment

Access for humans *and* machines

The best news:
We eat our own dog food!

More information at *http://wiki.ontoworld.org/*

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Agenda

- SEKT Project Overview
- Methodology Bubbles
- Technology Bubbles
  - KAON2
  - Semantic MediaWiki
- **Conclusion**

More Bubbles …

- „How do I map ontologies?"
  - FOAM – Framework for Ontology Alignment and Mapping
  - NEW: Integrated in latest Protégé/PROMPT distribution
  - Open source software available:

    http://ontoware.org/projects/map

More Bubbles ...

- „How do I evaluate ontologies?"
  - Automatic Evaluation of Ontologies (AEON)
  - Facilitates well-known OntoClean approach
  - Open source software available:

    http://ontoware.org/projects/aeon

More Bubbles ...

- „How much does it cost to develop ontologies?"
  - ONTOCOM: A Cost Estimation Model for Ontology Engineering
  - Online questionnaire:

    http://ontocom.ag-nbi.de/

    Please participate

SEKT Results

- **SEKT advances** state-of-the-art on Semantic Technologies *significantly*

- **Many tangible results, including:**
  - DILIGENT Methodology
  - KAON2 Reasoning „*Sophisticated Backend*"
  - Semantic MediaWiki „*Semantics for the People*"
  - Tools Tools Tools …

http://www.sekt-project.org

SEKT Results

- **Special Issue on Semantically Enabled Knowledge Technologies**
  John Davies (Editor) and York Sure (Editor)
  Journal of Knowledge Management, Volume 9(5),
  Emerald Group Publishing Limited. October 2005.

- **Semantic Web Technologies : Trends and Research in Ontology-based Systems**
  by John Davies (Editor), Rudi Studer (Editor),
  Paul Warren (Editor)
  Hardcover: 326 pages
  Publisher: John Wiley & Sons (July 11, 2006)
  Language: English
  ISBN: 0470025964

- Further selected publications attached

Thank You!

York Sure
Institute AIFB, University of Karlsruhe
http://www.york-sure.de/

Selected References
Methodology

- **An Argumentation Ontology for DIstributed, Loosely-controlled and evolvInG Engineering processes of oNTologies (DILIGENT)**

  Christoph Tempich, H. Sofia Pinto, York Sure, Steffen Staab.

  In Asunción Gómez-Pérez and Jérôme Euzenat, Second European Semantic Web Conference, (ESWC 2005), volume 3532 of LNCS, pp. 241--256. Springer, Heraklion, Crete, Greece, May 2005.

  http://www.aifb.uni-karlsruhe.de/Publikationen/showPublikation?publ_id=892

- **ONTOCOM: A Cost Estimation Model for Ontology Engineering**

  Elena Paslaru Bontas Simperl, Christoph Tempich, and York Sure.

  Accepted for publication. *To appear in: Proceedings of the 5th International Semantic Web Conference (ISWC2006), November 5-9, 2006, Athens, GA, US, LNCS.* Springer Verlag.

  http://www.aifb.uni-karlsruhe.de/Publikationen/showPublikation?publ_id=1254

Selected References
Technology

- **A Framework for Handling Inconsistency in Changing Ontologies**

  Peter Haase, Frank van Harmelen, Zhisheng Huang, Heiner Stuckenschmidt, York Sure.

  In Yolanda Gil, Enrico Motta, V. Richard Benjamins, and Mark A. Musen, *Proceedings of the Fourth International Semantic Web Conference (ISWC2005)*, volume 3729 of *LNCS*, pp. 353-367. Springer, November 2005.

  http://www.aifb.uni-karlsruhe.de/Publikationen/showPublikation?publ_id=982

- **Automatic Evaluation of Ontologies (AEON)**
  Johanna Völker, Denny Vrandecic, and York Sure.
  In: Yolanda Gil, Enrico Motta, V. Richard Benjamins, and Mark A. Musen (Eds.) *Proceedings of the 4th International Semantic Web Conference (ISWC2005), November 6-10, 2005, Galway, Ireland*, pages 716-731, volume 3729 of *LNCS*. Springer Verlag Berlin-Heidelberg.

  http://www.aifb.uni-karlsruhe.de/Publikationen/showPublikation?publ_id=975

Selected References
Technology

- **Bootstrapping Ontology Alignment Methods with APFEL**

  Marc Ehrig, Steffen Staab, York Sure

  In Y. Gil, E. Motta, V. R. Benjamins, M. A. Musen, Proceedings of the 4th International Semantic Web Conference, ISWC 2005, Galway, Ireland, November 6-10, 2005., volume 3729 of LNCS, pp. 186-200. Springer, November 2005.

  http://www.aifb.uni-karlsruhe.de/Publikationen/showPublikation?publ_id=1028

- **Semantic Wikipedia**

  Max Völkel, Markus Krötzsch, Denny Vrandecic, Heiko Haller, Rudi Studer.

  In Proceedings of the 15th international conference on World Wide Web, WWW 2006, Edinburgh, Scotland, May 23-26, 2006. May 2006.

  http://www.aifb.uni-karlsruhe.de/Publikationen/showPublikation?publ_id=1055