

SEAL — a SEmantic portAL with content management functionality

CRIS 2002

29.08.02, Kassel, Germany

Steffen Staab

work together with
Rudi Studer
York Sure
Raphael Volz

Institut AIFB, Universität Karlsruhe

<http://www.aifb.uni-karlsruhe.de/WBS>



Ontoprise GmbH, Karlsruhe

- Semantics for the Web -

<http://www.ontoprise.de>



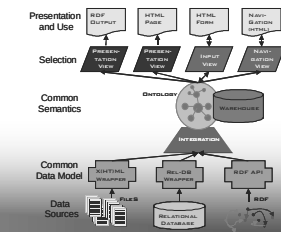
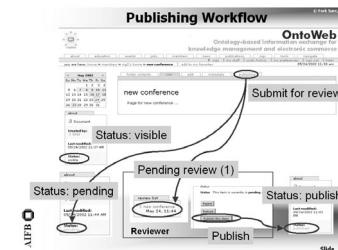
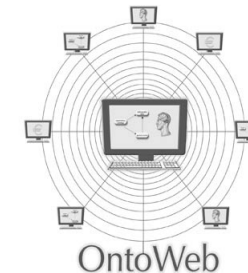
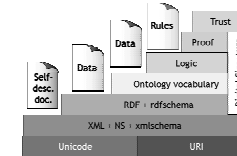
L3S Learning Lab, Hannover/Karlsruhe

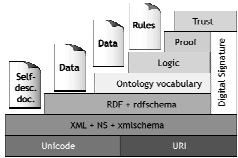
<http://www.learninglab.de>



Agenda

- The Semantic Web
- The OntoWeb Community and it's Portal
- Content Provision in OntoWeb
 - i. Content Syndication
 - ii. Content Objects
 - iii. Review Process
- Architecture for SEmantic portALs (SEAL)
- Conclusion





Where are we now? Problems?

© Steffen Staab & York Sure 2002

▪ERP: Thousands of
Tables

▪WWW: Billions of documents

Find &

▪CRIS: Petabyte
of Information

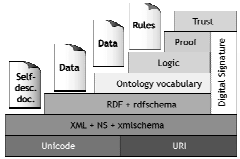
Content-based
Aggregation

←▪Email Staab: 24874

▪Content Management:
Millions of Documents

▪Laptop-Harddisk:
31518 Files with data





AGGREGATE CONTENT – GENERATE KNOWLEDGE

1
&
2
=

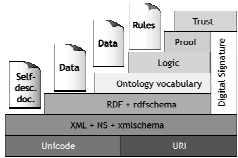
3

SEMANTIC TECHNOLOGIES

**CONTEXT
ANSWERS
NEW KNOWLEDGE**

Rudi Studer knows the SemanticWeb

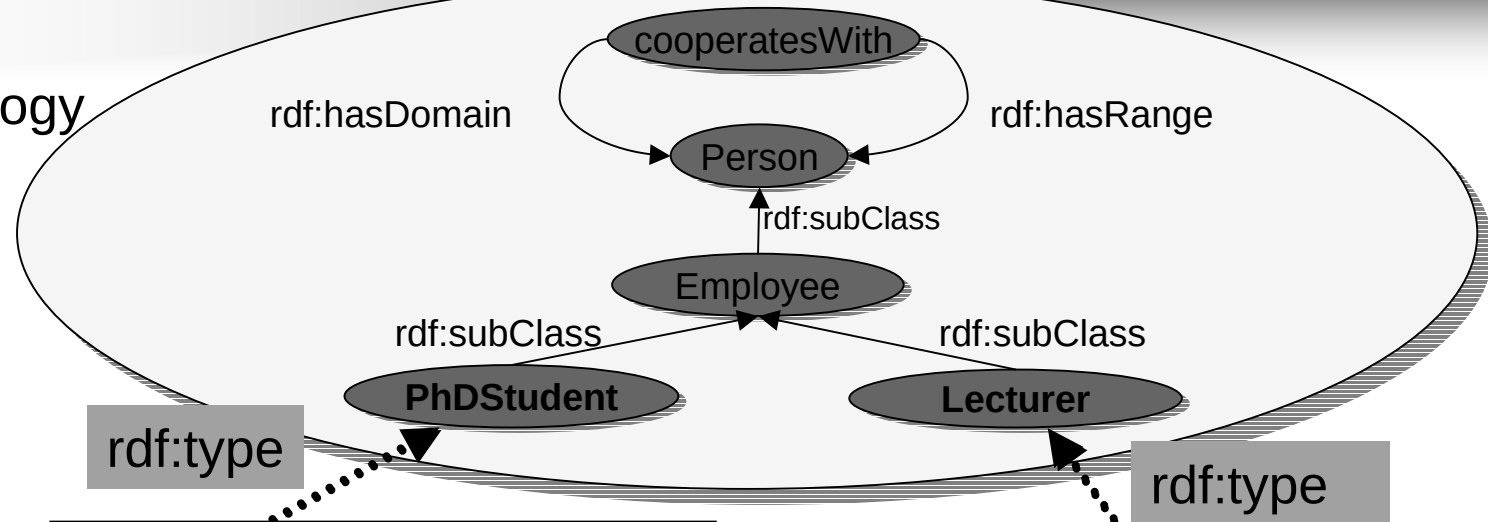
AIFB



Semantic Web

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Ontology



Meta-
data

```
<swrc:PhDStudent rdf:ID="person_sha">
  <swrc:name>Siegfried
  Handschuh</swrc:name>
  <swrc:cooperatesWith rdf:resource=
    "http://www.aifb.uni-
    karlsruhe.de/WBS/sst#person_sst"/
  ...
</swrc:PhDStudent>
```

```
<swrc:Lecturer
  rdf:ID="person_sst">
  <swrc:name>Steffen Staab
  </swrc:name>
  ...
</swrc:Lecturer>
```

swrc:cooperatesWith

Web
page

**Siegfried
Handschuh**



He is working together with
Steffen Staab in the Knowledge
Management Group

Steffen Staab



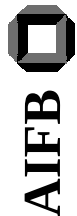
Research:

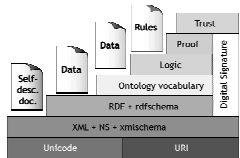
Semantic Web, Knowledge
Management, Natural Language,

URL

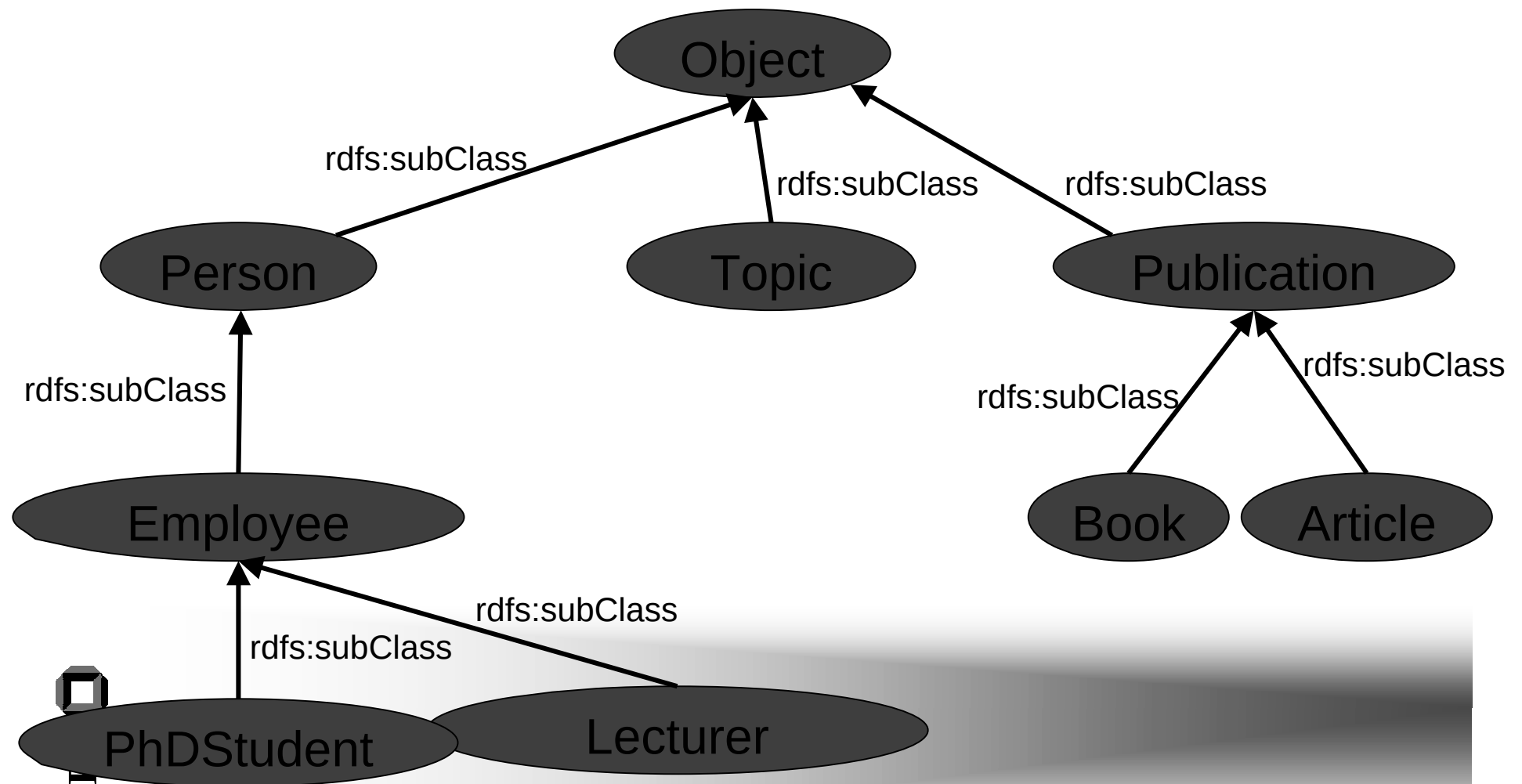
<http://www.aifb.uni-karlsruhe.de/WBS/sha>

<http://www.aifb.uni-karlsruhe.de/WBS/sst>

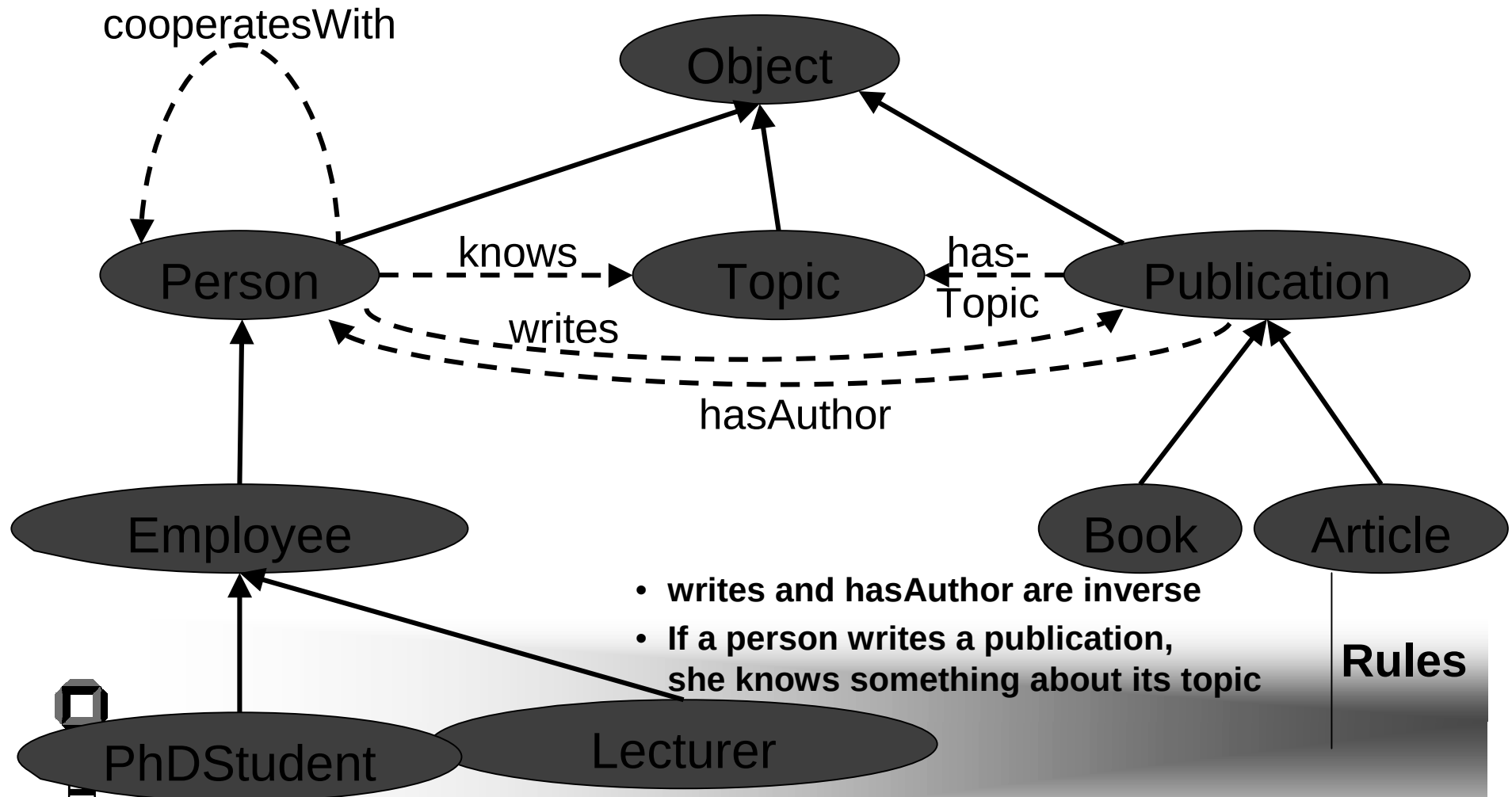




KNOWLEDGE MODELLING: ONTOLOGY

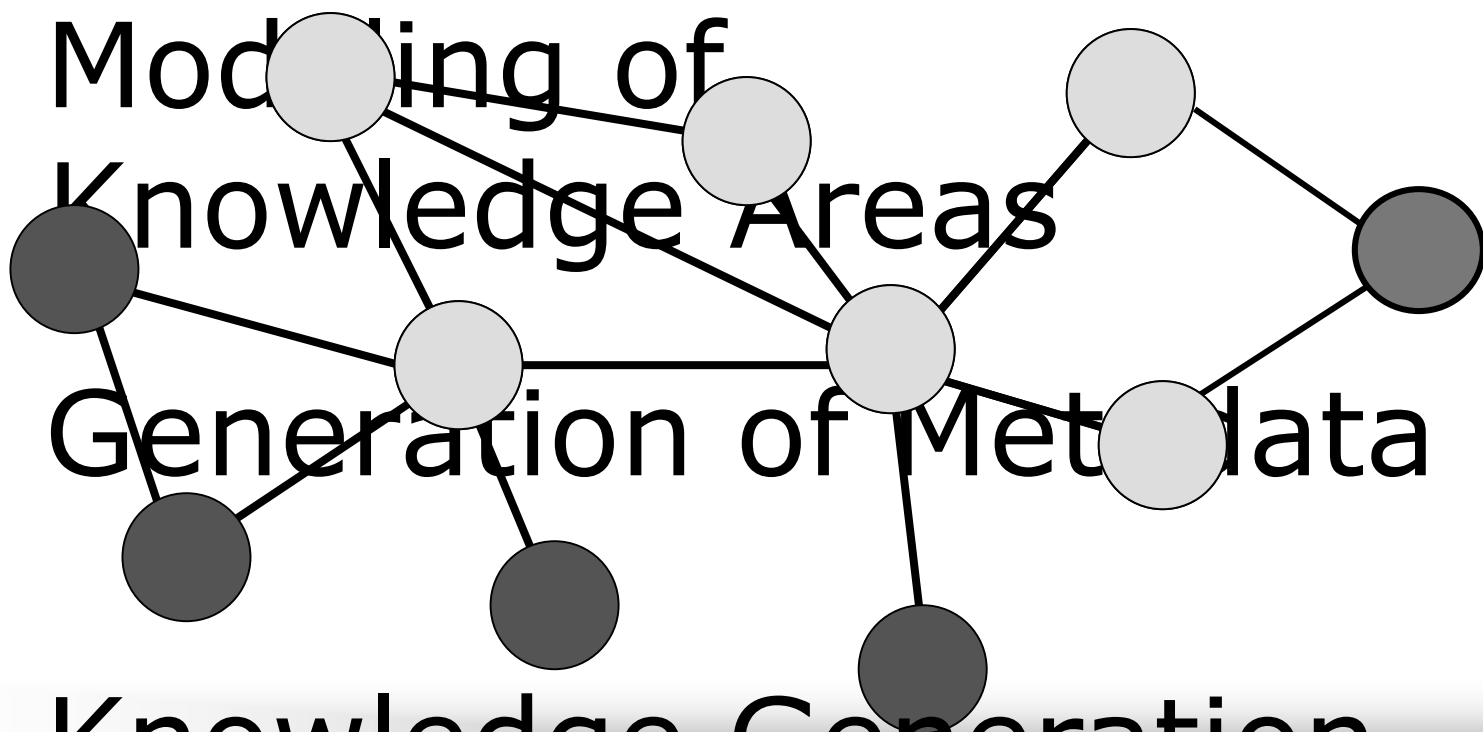


KNOWLEDGE MODELLING: ONTOLOGY

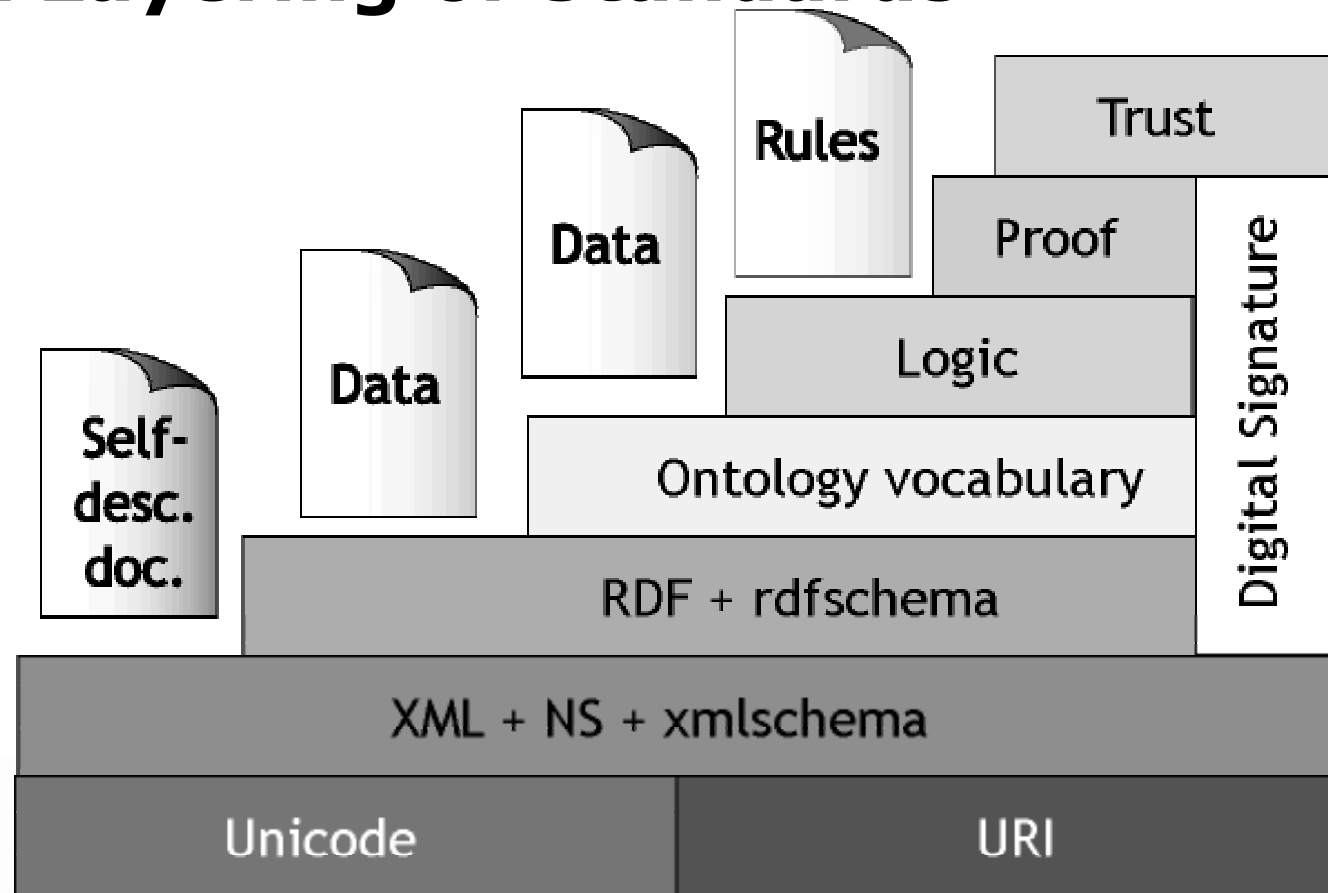


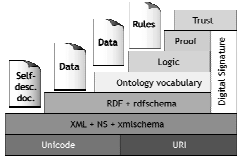
Rules

SEMANTIC TECHNOLOGIES

- 
1. Modeling of Knowledge Areas
 2. Generation of Metadata
 3. Knowledge Generation with Rules

The Layer-Cake of Tim Berners-Lee: A Layering of Standards





CREAM – Creating Metadata

1st Semantic Web conference

Ontology Browser

- Formal Language
 - Method
 - Organization
 - Person
 - Project
 - Publication
 - Book
- Towards Semantic Web Mining

HTML Browser 2

URL: localhost/E:/home/hand/dev/OntoMatProj/ontomatApril2002/resources/html/semantic_web_mining.html

Document Viewer / Editor

Concepts

Guidance & Instances of Concepts

Attribute Instances = instance of a property to a datatype instance

Relationship Instances = instance of a property to a class instance

Attributes	Values
title	Towards Semantic ...
author (Person)	Bettina Berendt Gerd Stumme Andreas Hotho



ontoprise [Handschuh, Staab, Mädche; K-CAP 2001]

Annotation by Typing Facts

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Generate
Class
Instance

Attribute
Instance

Relationship
Instance

OntoMat-Annotizer

File Edit View Tools Window Help

Ontology Browser 1

- Employee
- New_Member
- Associate_Professor
- Full_Professor
- Lecturer
- Researcher
- Student
- PhDStudent

Steffen Staab

Attribute	Value
address	
email	sst@aifb.uni-karls...
fax	
first_Name	
homepage	
last_Name	

- has_affiliation (Organization)
- involved_in_project (Project)
- research_topics (Topic)

HTML Browser 1

URL: localhost/E:/home/hand/dev/OntoMatProj/ontomat/April2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

Bettina Berendt
Institute of Information Systems, Humboldt University Berlin
Spandauer Str. 1, D--10178 Berlin,
Germany

Andreas Hotho, Gerd Stumme
Institute of Applied Informatics and Formal Description Methods AIFB,
University of Karlsruhe,
D--76128 Karlsruhe,
Germany

Research Paper at International Semantic Web Conference
(ISWC) 2002, June 9-12th, 2002 Sardinia, Italia

Abstract

Semantic Web Mining aims at combining the two fast-developing research areas Semantic Web and Web Mining. The idea is to improve, on the one hand, the results of Web Mining by exploiting the new semantic structures in the Web; and to make use of Web Mining, on the other hand, for building up the Semantic Web. This paper gives an overview of where the two areas meet today, and sketches ways of how a closer integration could be profitable.

HTML Source Annotation

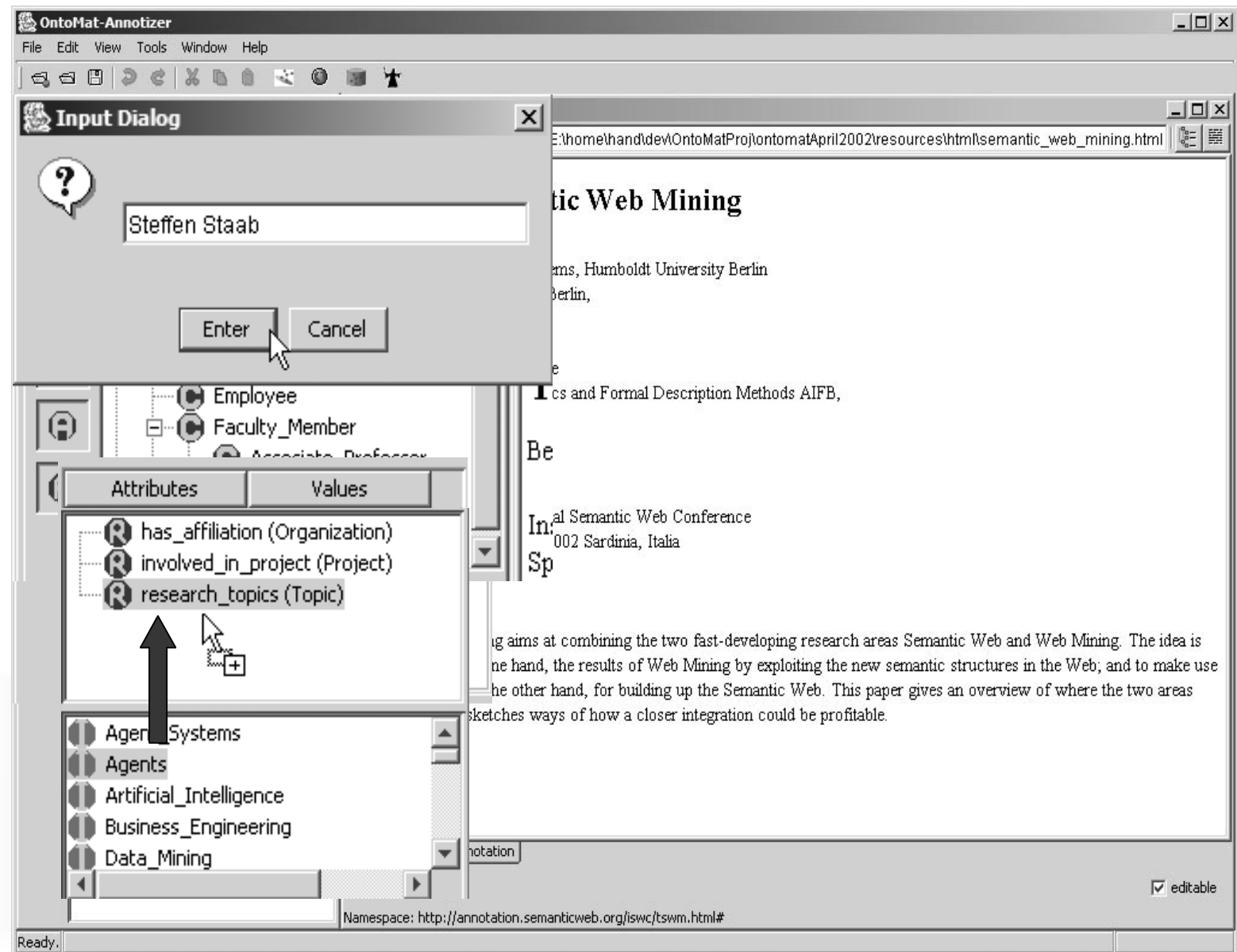
State: Loaded

Namespace: http://annotation.semanticweb.org/iswc/tswm.html#

Ready.

Annotation by Typing Facts

© Steffen Staab & York 2002



Annotation by Typing Facts

© Steffen Staab & York P. 2002



OntoMat-Annotizer

File Edit View Tools Window Help

Ontology Browser 1

- Employee
 - Faculty_Member
 - Associate_Professor
 - Full_Professor
 - Lecturer
 - Researcher
 - Student
 - PhDStudent

Steffen Staab

Attributes	Values
address	
email	sst@aifb.uni-karls...
fax	
first_Name	
homepage	
last_Name	

- has_affiliation (Organization)
- involved_in_project (Project)
- research_topics (Topic)

HTML Browser 1

URL: localhost/E:/home/hand/dev/OntoMatProj/ontomat/April2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

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Institute of Information Systems, Humboldt University Berlin
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Andreas Hotho, Gerd Stumme
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HTML Source Annotation

State: Loaded

Namespace: http://annotation.semanticweb.org/iswc/tswm.html#

Ready.

Annotation by Markup

© Steffen Staab & York Sure 2002



Generate
Class
Instance

Attribute
Instance

Relationship
Instance

The screenshot shows the OntoMat-Annotizer application with two main panes. The left pane, 'Ontology Browser 1', displays a hierarchical tree of ontology classes. The right pane, 'HTML Browser 1', shows an HTML document being annotated.

Ontology Browser 1:

- Project
 - Publication
 - Book
 - InProceedings
 - Proceedings
 - Report
 - Tool
 - Topic

HTML Browser 1:

URL: localhost/E:/home/handidev/OntoMatProj/ontomatApril2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

Bettina Berendt
Institute of Information Systems, Humboldt University Berlin
Spandauer Str. 1, D--10178 Berlin,
Germany

Andreas Hotho, Gerd Stumme
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Attributes Table:

Attributes	Values
title	Towards Semantic ...
year	2002

Relationships List:

- conference (Conference)
- formal_language (Formal_Lan...
- method (Method)
- tool (Tool)
- topic (Topic)

Bottom Panel:

HTML Source Annotation

State: Loaded

Namespace: http://annotation.semanticweb.org/iswc/tswm.html#

Ready.

Markup of Objects (Instantiation of Classes)

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The screenshot displays the OntoMat-Annotizer application. On the left, the 'Ontology Browser' shows a hierarchical tree of classes: Organization, Person, Project, Publication, Book, InProceedings, Proceedings, Report, Tool, and Topic. The 'InProceedings' class is selected. Below this, a table lists attributes and their values for the selected class. The 'HTML Browser' window on the right displays the document 'Towards Semantic Web Mining' by Bettina Berendt. The document content includes author information, affiliations, and an abstract. The interface also shows a 'Ready' status bar at the bottom.

Ontology Browser

- Organization
- Person
- Project
- Publication
- Book
- InProceedings
- Proceedings
- Report
- Tool
- Topic

Attributes	Values
title	
year	

HTML Browser

URL: localhost/E:/home/hand/idevOntoMatProj/ontomatApril2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

Bettina Berendt

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<http://www.wiwi.hu-berlin.de/~berendt>
berendt@wiwi.hu-berlin.de

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D--76128 Karlsruhe,
Germany
<http://www.aifb.uni-karlsruhe.de/WBS>
([hotho](mailto:hotho@aifb.uni-karlsruhe.de), [stumme](mailto:stumme@aifb.uni-karlsruhe.de))@aifb.uni-karlsruhe.de

Abstract

Semantic Web Mining aims at combining the two fast-developing research areas Semantic Web and Web Mining. The idea is to improve, on the one hand, the results of Web Mining by exploiting the new semantic structures in the Web; and to make use of Web Mining, on the other hand, for building up the Semantic Web. This paper gives an overview of where the two areas meet today, and sketches ways of how a closer integration could be profitable.

Research Paper at International Semantic Web Conference (ISWC) 2002, June 9-12th, 2002 Sardinia, Italia

HTML Source Annotation

State: Loaded

Namespace: http://annotation.semanticweb.org/iswc/Towards_Semantic_Web_Mining.html#

Ready.

Markup of Attributes

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Attributes	Values
title	Towards Semantic ...
year	2002

Research Paper at International (ISWC) 2002, June 9-12th, 200

Abstract

Markup of Objectrelationships

OntoMat-Annotizer

File Edit View Tools Window Help

Ontology Browser 1

- Project
- Publication
 - Book
 - InProceedings
 - Proceedings
 - Report
- Tool
- Topic

HTML Browser 1

URL: localhost/E:/home/handidev/OntoMatProj/ontomat/April2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

Bettina Berendt
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Andreas Hotho, Gerd Stumme
Institute of Applied Informatics and Formal Description Methods AIFB,
University of Karlsruhe,
D--76128 Karlsruhe,
Germany

Research Paper at International Semantic Web Conference

Attributes **Values**

Attributes	Values
title	Towards Semantic

method (Method)

tool (Tool)

topic (Topic)

Semantic Web Mining

Semantic Web Mining aims at to improve, on the one hand, the state of Web Mining, on the other hand to meet today, and sketches way:

Annotation by Authoring

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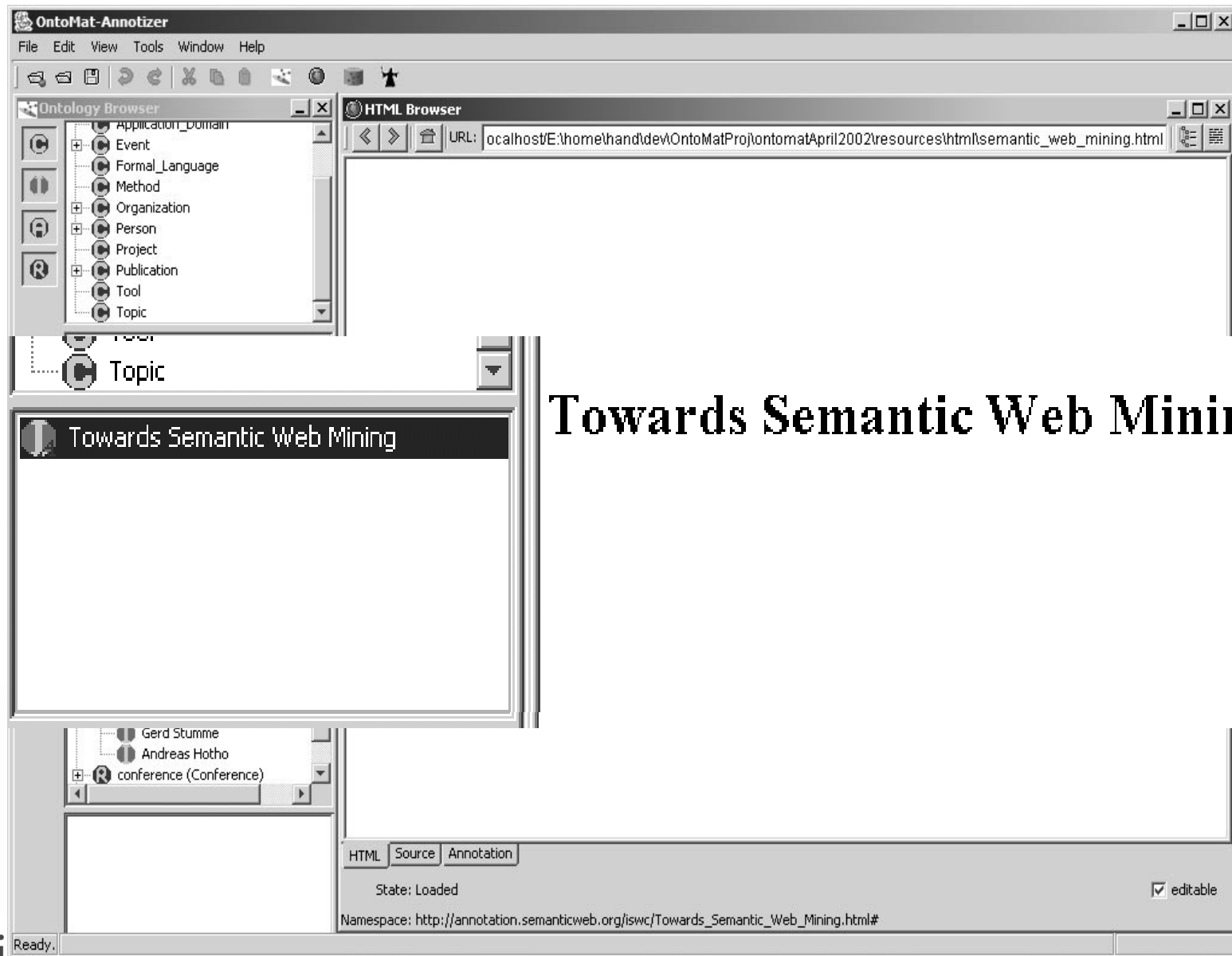


The screenshot shows the OntoMat-Annotizer application with the following components:

- Ontology Browser:** A tree view on the left showing a hierarchy of classes: Application_Domain, Event, Formal_Language, Method, Organization, Person, Project, Publication, Tool, and Topic. Below this is a table with 'Attributes' and 'Values' for the selected class 'Towards Semantic Web Mining'.
- HTML Browser:** A window on the right showing the URL 'localhost/E:/home/handidev/OntoMatProj/ontomatApril2002/resources/html/semantic_web_mining.html' and a text area for editing HTML content.
- Annotation Table:** A table below the HTML browser showing the current state of the annotation, including the text 'Towards Semantic Web Mining has author Gerd Stumme'.
- Annotations:** Three callout boxes provide instructions:
 - 'Create Text and if possible Links out of a Class Instance' points to the 'Towards Semantic Web Mining' class in the ontology browser.
 - 'Attribute Instance' points to the 'year' attribute in the table.
 - 'Relationship Instance generates simple text' points to the text 'Towards Semantic Web Mining has author Gerd Stumme' in the HTML browser.
- Status Bar:** At the bottom, it shows 'State: Loaded', the namespace 'http://annotation.semanticweb.org/iswc/Towards_Semantic_Web_Mining.html#', and an 'editable' checkbox.

Use of Objects

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Towards Semantic Web Mining

AIFB

ontoprise

Use of Objectattributes

© Steffen Staab & York Sure 2002



OntoMat-Annotizer

File Edit View Tools Window Help

Ontology Browser 1

- Project
- Publication
 - Book
 - InProceedings
 - Proceedings
 - Report
- Tool
- Topic

Towards Semantic Web Mining

HTML Browser 1

URL: localhost/E:/home/hand/dev/OntoMatProj/ontomatApril2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

Attributes	Values
title	Towards Semantic ...
year	2002

written in 2002

Andreas Hotho
Bettina Berendt
Gerd Stumme

HTML Source Annotation

State: Loaded

Namespace: http://annotation.semanticweb.org/iswc/tswm.html#

Ready.

☒ editable

Use of Objectrelationships

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OntoMat-Annotizer

File Edit View Tools Window Help

Ontology Browser

- Application_Domain
 - Event
 - Formal_Language
 - Method
- Organization
- Person
- Project
- Publication
- Tool
- Topic

Towards Semantic Web Mining

Attributes	Values
title	Towards Semantic ...
year	2002

HTML Browser

URL: localhost/E:/home/hand/dev/OntoMatProj/ontomat/April2002/resources/html/semantic_web_mining.html

Towards Semantic Web Mining

written in 2002

author (Person)

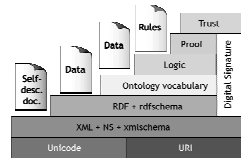
- Bettina Berendt
- Gerd Stumme
- Andreas Hotho

conference (Conference)

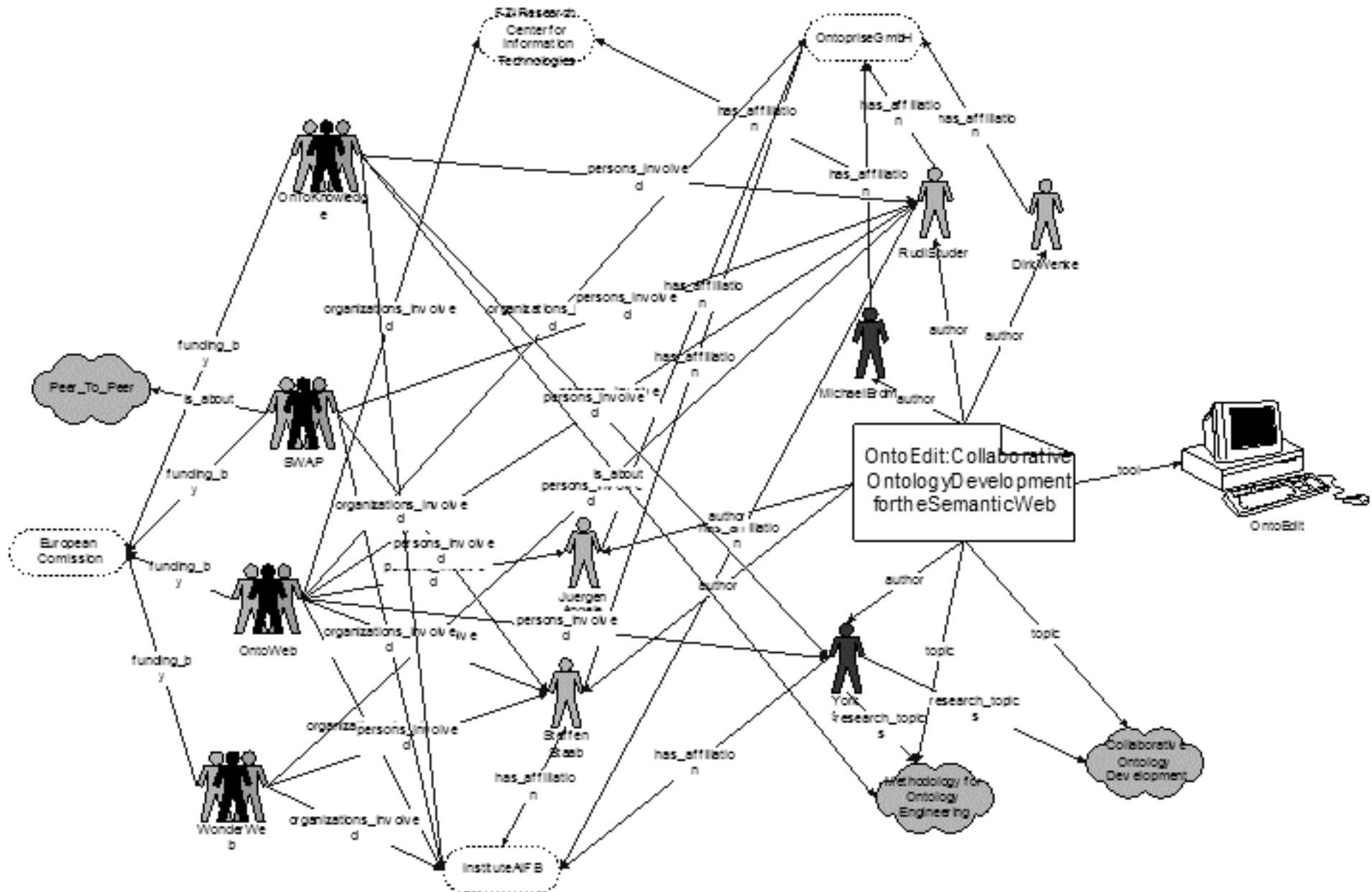
Ready.

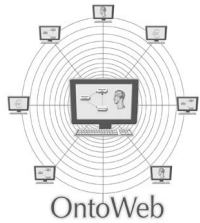
Namespace: http://annotation.semanticweb.org/iswc/Towards_Semantic_Web_Mining.html#

editable



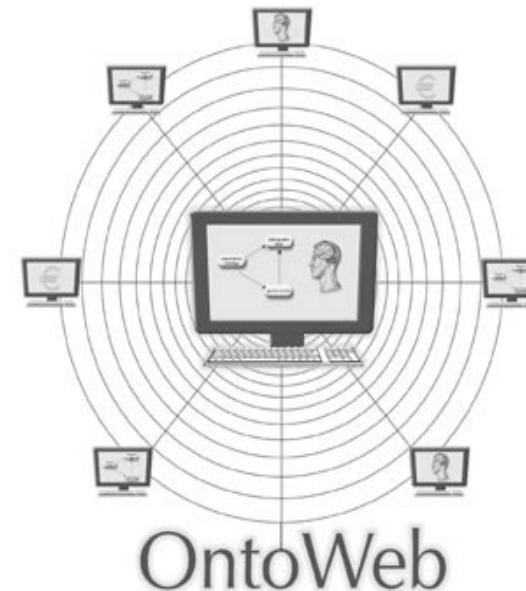
1st Semantic Web conference

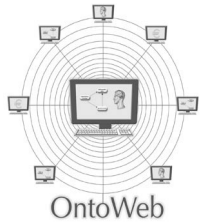




The OntoWeb Community

- OntoWeb (IST-2000-25056) is an EU-funded network of excellence
- Currently over **100 partners**
 - Academia and industry
 - Mostly European partners
- Subtitle: Ontology-based information exchange for knowledge management and electronic commerce





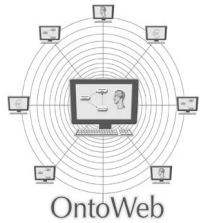
The OntoWeb Portal

- Access Information
 - Navigation
 - Semantic Querying



Cooperation with
Free University Brussels

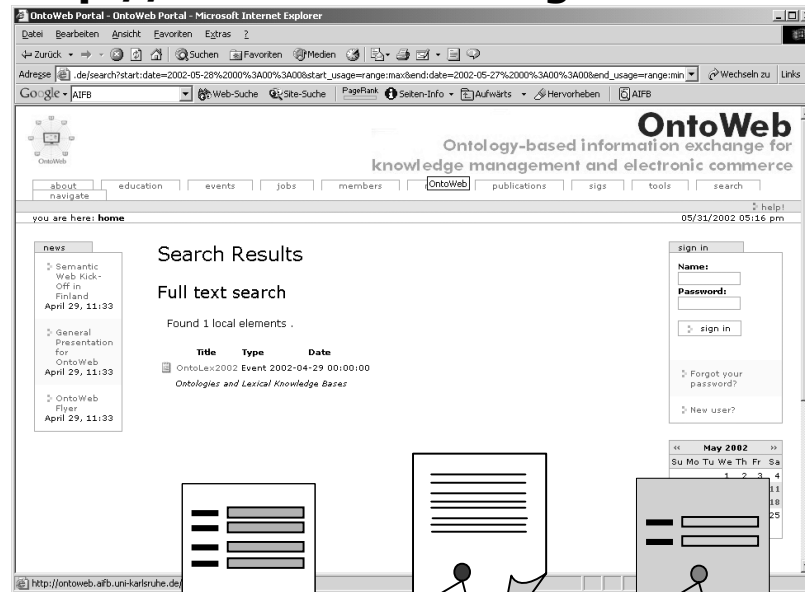
- Provide Information
 - *Outside the Portal:*
Collection of metadata
located on external pages
 - *Inside the Portal:*
Provision of *selected* information using
templates generated from ontology



The OntoWeb Portal

© Steffen Staab & York Sure 2002

<http://www.ontoweb.org>



Generated
Content Objects

Annotated
Web Pages

Ontology
Browse & Query
Front End

Content
Syndication
Service

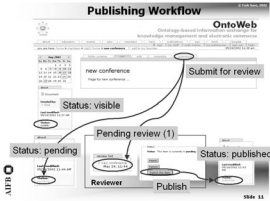
Participating Site_n

Participating Site₂

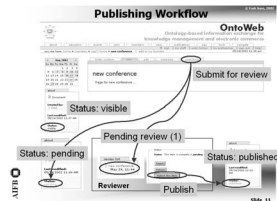
Participating Site₁

OntoWeb Community

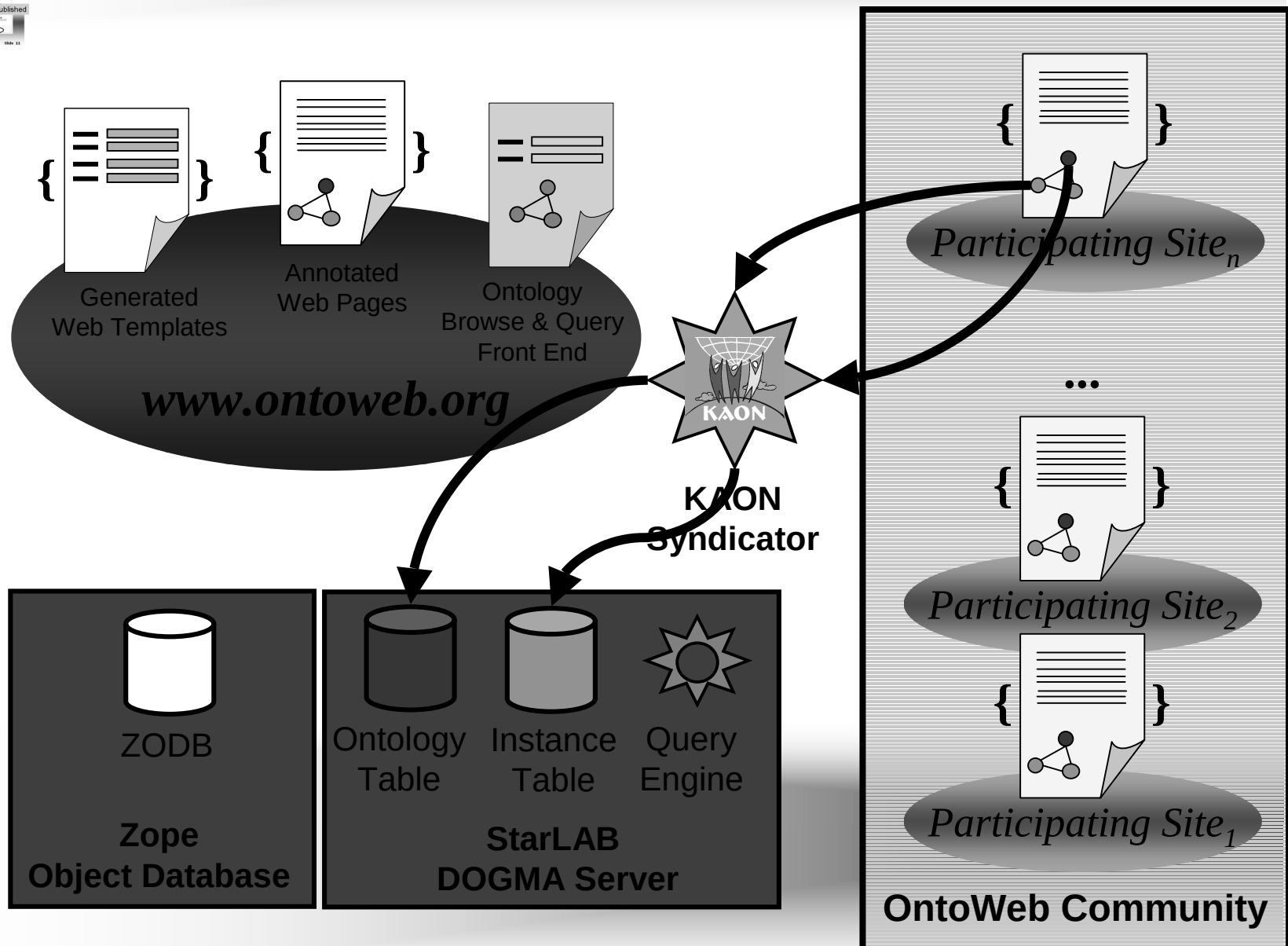
Content Syndication



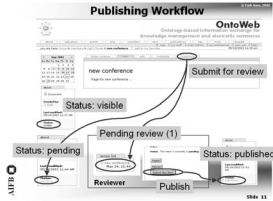
- Portal must allow **centralized access** to distributed information
- Participants can **enrich resources** located outside of the portal **with metadata**
- Metadata aligns this information towards the **ontology**
- OntoWeb is **syndicating** information from participants by replicating their metadata



Content Syndication

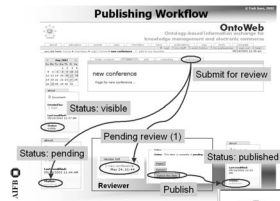


Content Objects



- Portal supports the **direct provisioning** of semantic facts
- **Uniform look** for core information
e.g. information about a SIG
- Users can edit and view (new) facts
using templates
- Facts are stored in **content objects**
- Edit/View interface & content objects are
generated from ontology

Content Objects



OntoWeb
Ontology-based information exchange for knowledge management and electronic commerce

about education events jobs members news publications sigs tools navigate help!

you are here: home » events » **www11** 05/24/2002 11:26 am

sign in
Name:
Password:
sign in
Forgot your password?
New user?

May 2002
Su Mo Tu We Th Fr Sa
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

navigation
www11
Up one level

related
Local resources
OntoWeb2
KR 2002

WWW11
The Eleventh International World Wide Web Conference
For more information, visit <http://www2002.org/>

Event Details

What Meeting

When Between 2002/05/07 01:00:00 and 2002/05/11 13:00:00

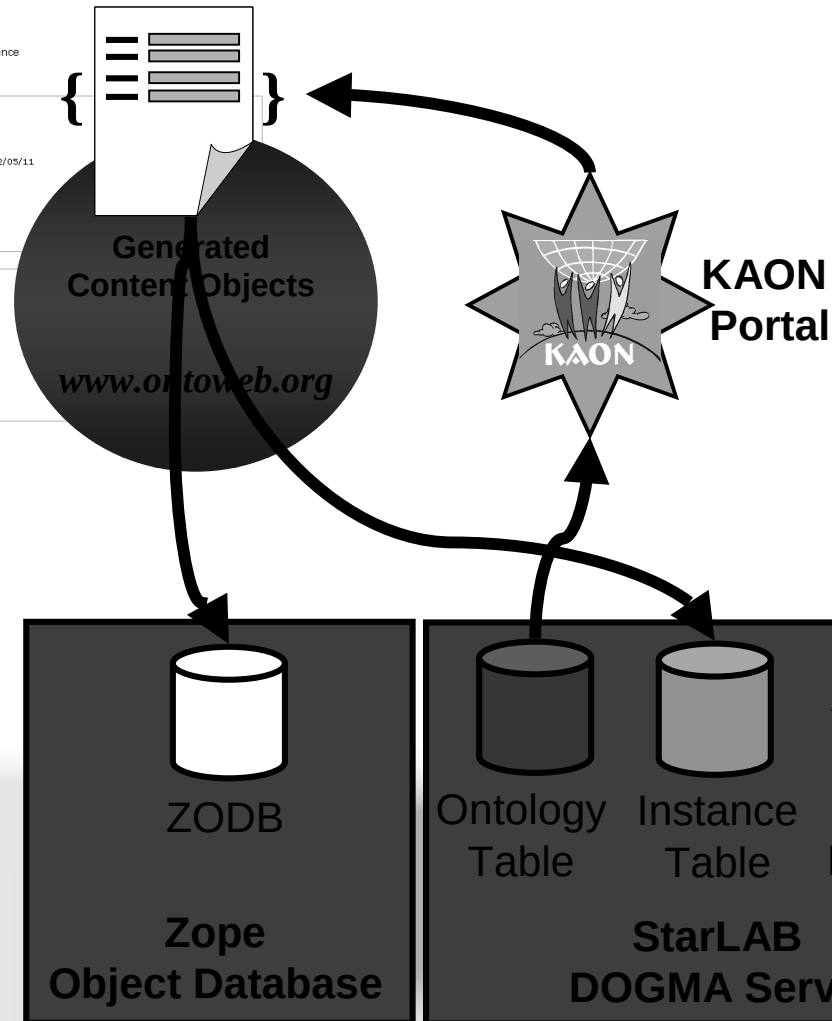
Where Honolulu, Hawaii (USA)

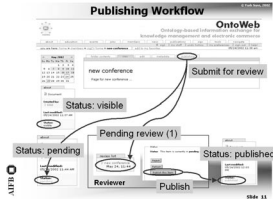
Contact details

Name

Contact Email

Contact Phone





Publishing Workflow

- Goal:
 - **Reduce overhead** as far as possible
 - Guarantee **quality** of portal contents

- Idea:
 - Portal Members can have a **reviewer role**
 - Members have **private content** on their web space
 - To make this information **public** content has to be reviewed by reviewers

Publishing Workflow

OntoWeb

Ontology-based information exchange for
knowledge management and electronic commerce

about education events jobs members news publications sigs tools navigate
 you are here: home » members » sig2's home » new conference » add to my favorites 05/24/2002 11:38 am

« May 2002 »

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

new conference

Page for new conference ...

Submit for review

Status: visible

Status:
visible

Status: pending

Last modified:
05/24/2002 11:44 AM

Status:
pending

Pending review (1)

review list
 new conference
 May 24, 11:44

Reviewer

Status
 Status This item is currently in pending

Reject

Retract

Publish this Item

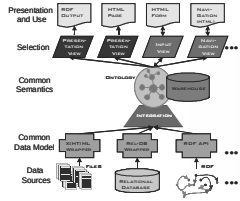
Publish

Status: published

Last modified:
05/24/2002 12:03 PM

Status:
published





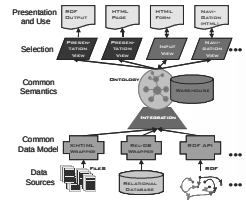
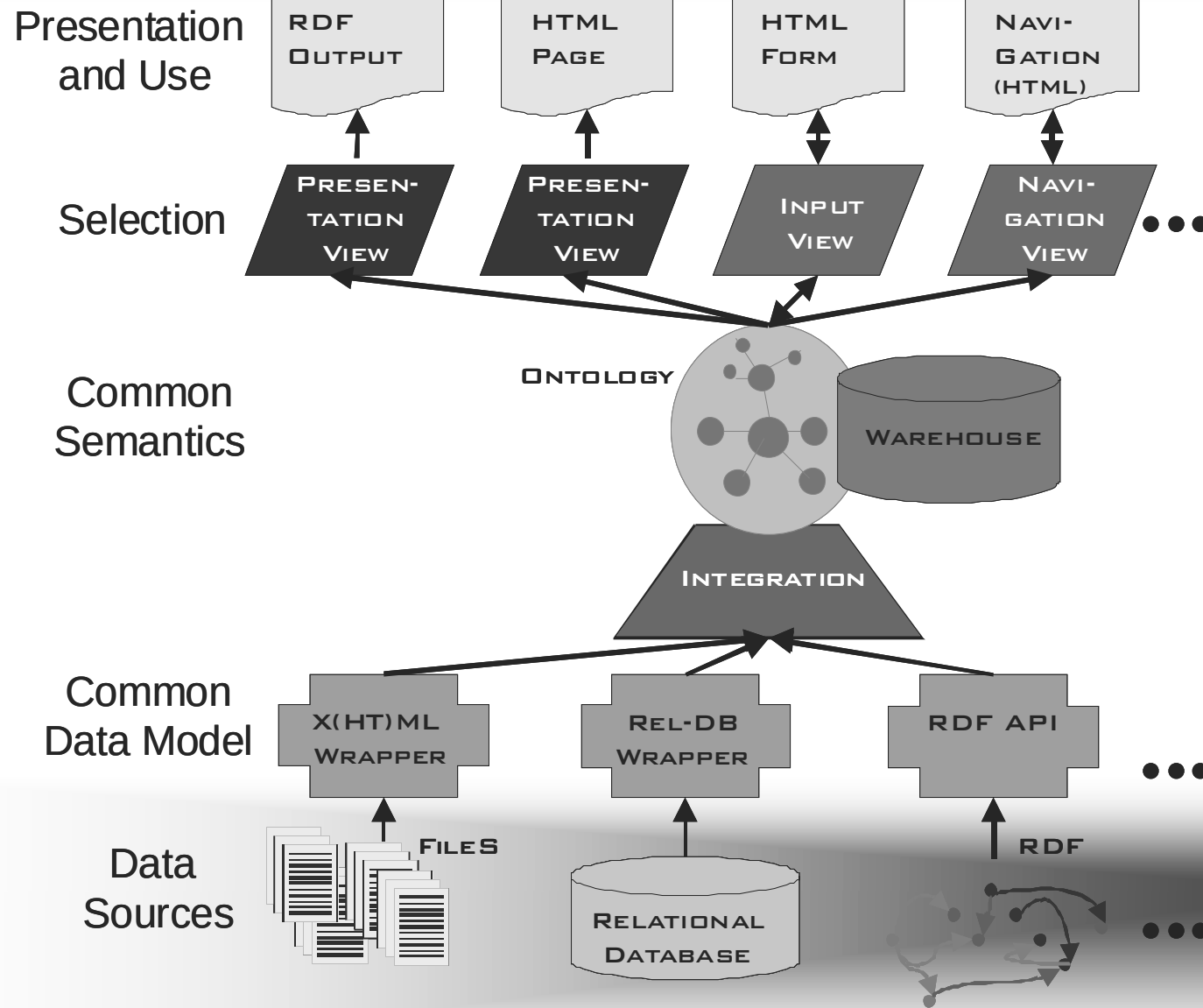
Content integration @ work

SEAL (SEmantic portALs) like OntoWeb require:

- **Web information integration:**
 - Support semantic integration of heterogeneous sources
 - Support content providing by large collection of portal users

- **Web site management:**
 - Semantic querying and navigational views
 - Input views
 - Agent access to portal content

Conceptual Architecture for SEALs



Conclusion

- **Join the OntoWeb Community:**

<http://ontoweb.aifb.uni-karlsruhe.de>

We will move the portal in September/October to:

<http://www.ontoweb.org>

- **Interesting Events:**

2nd Conference on Professional Knowledge Management
(2. Konferenz Professionelles Wissensmanagement – Erfahrungen
und Visionen), 2.-4. April 2003, Luzern, Switzerland

<http://wm2003.aifb.uni-karlsruhe.de/>

International Semantic Web Conference, October 2003, Florida, US

Thank you!