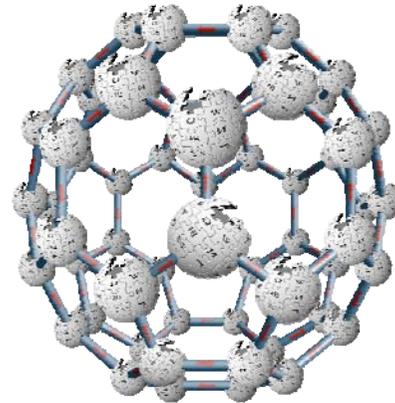Max Völkel, Markus Krötzsch, Denny Vrandecic,
Heiko Haller, Rudi Studer
AIFB and FZI Karlsruhe, Germany

@WWW2006, 26.05.2006

Semantic Wikipedia

`[[enhances::Wikipedia]]`

Wikipedia today

- A free online encyclopædia

- 16th most accessed web site on earth
  - According to Alexa.com

- \> 4 mio articles

- over 30.000 active contributors
  - contributed 5 times or more per month in Nov 2005

Wikipedia today

article   discussion   **edit this page**   history

*Your **continued donations** keep Wikipedia running!*

Coffee

From Wikipedia, the free encyclopedia

Coffee is a beverage, served hot or with ice, prepared from the roasted seeds of the coffee plant. These seeds are almost always called **coffee beans.** Coffee is the second most commonly traded commodity in the world, trailing only petroleum. A total of 6.7 million tonnes of coffee were produced annually in 1998-2000, forecast to rise to 7 million tonnes annually by 2010.[1] Coffee is one of humanity's chief sources of caffeine, a stimulant. Its potential benefits and hazards have been, and continue to be, widely studied and discussed.
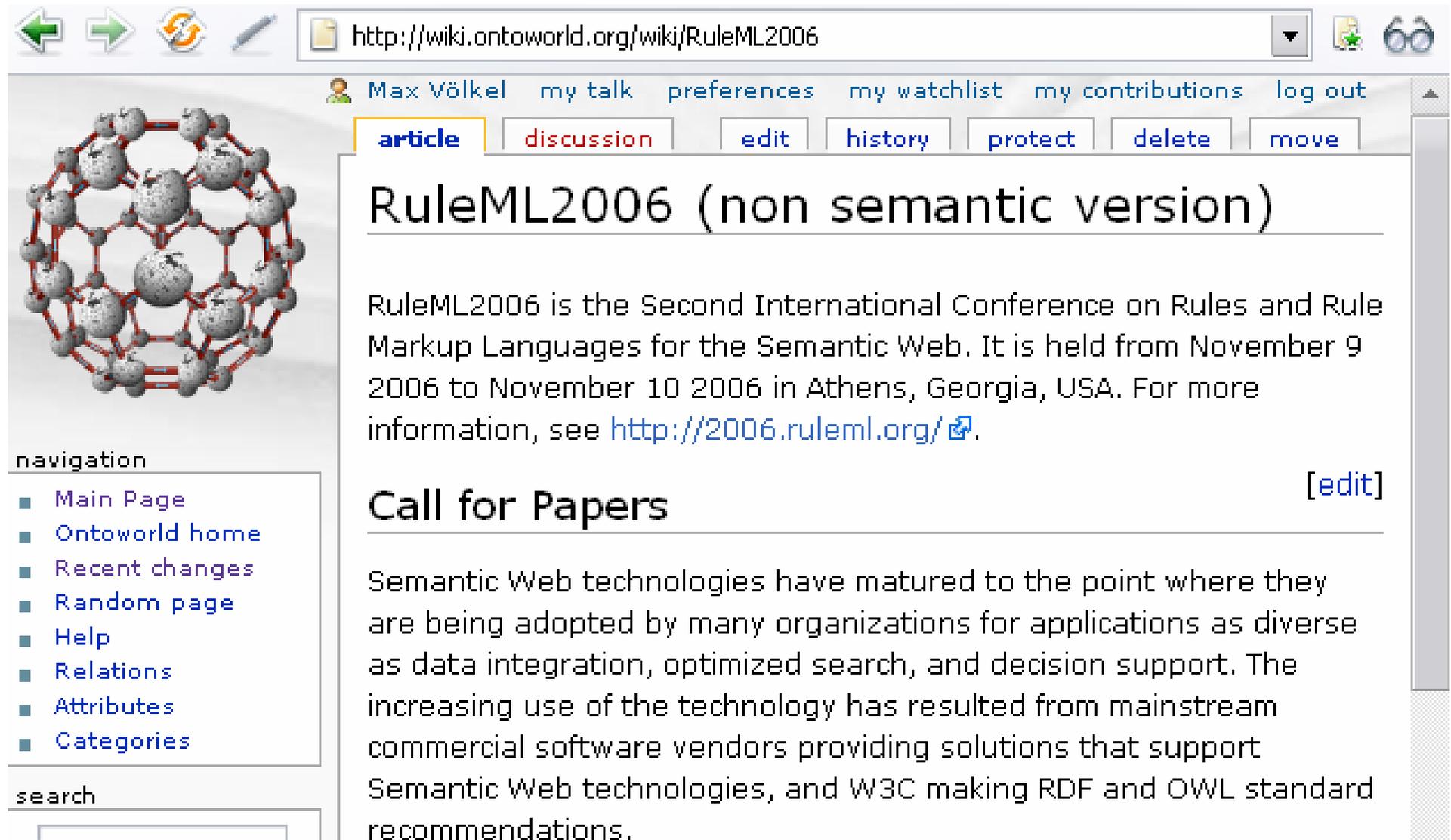
Coffee in beverage form

Contents [hide]

[edit]
Etymology and history

The word entered English in 1598 via Italian *caffè*, via Turkish *kahve*, from Arabic *qahwa*, meaning "to have no appetite," as in to have no appetite for sleep. Its ultimate

WIKIPEDIA
The Free Encyclopedia

navigation
- Main Page
- Community Portal
- Featured articles
- Current events
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- Random article
- Help
- Contact Wikipedia
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search

Go   Search

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

Wikipedia soon: An article about the RuleML conference in 2006

Wikipedia today: Consume

http://wiki.ontoworld.org/wiki/RuleML2006

Max Völkel   my talk   preferences   my watchlist   my contributions   log out

article   discussion   edit   history   protect   delete   move

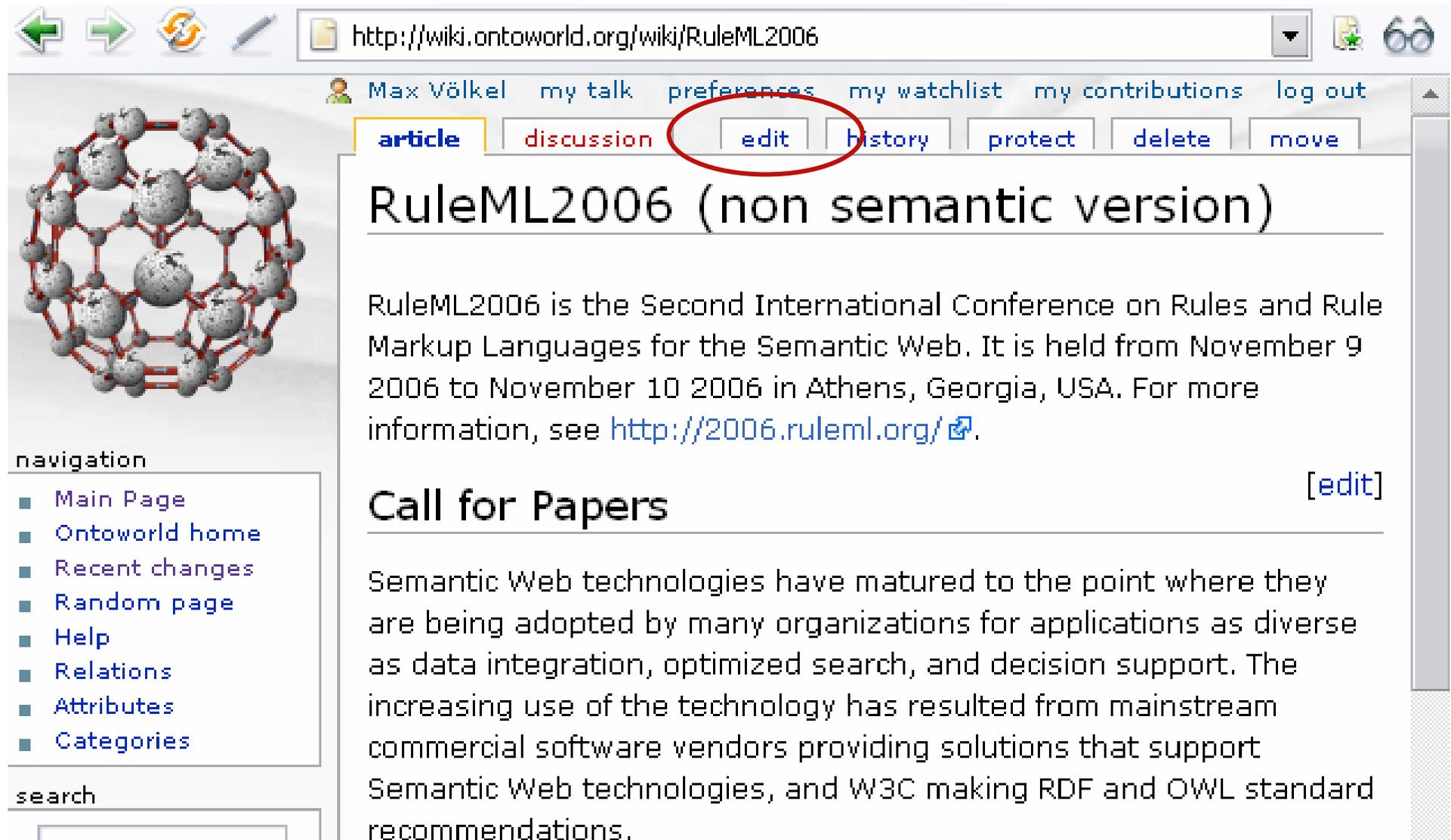## RuleML2006 (non semantic version)

RuleML2006 is the Second International Conference on Rules and Rule Markup Languages for the Semantic Web. It is held from November 9 2006 to November 10 2006 in Athens, Georgia, USA. For more information, see http://2006.ruleml.org/.

[edit]

Call for Papers

Semantic Web technologies have matured to the point where they are being adopted by many organizations for applications as diverse as data integration, optimized search, and decision support. The increasing use of the technology has resulted from mainstream commercial software vendors providing solutions that support Semantic Web technologies, and W3C making RDF and OWL standard recommendations.

navigation
- Main Page
- Ontoworld home
- Recent changes
- Random page
- Help
- Relations
- Attributes
- Categories

search

Wikipedia today: Consume and Contribute
Everybody can edit (almost) every page

Using Wikipedia

- Where can I publish my p
  on Semantic Web query
  languages?
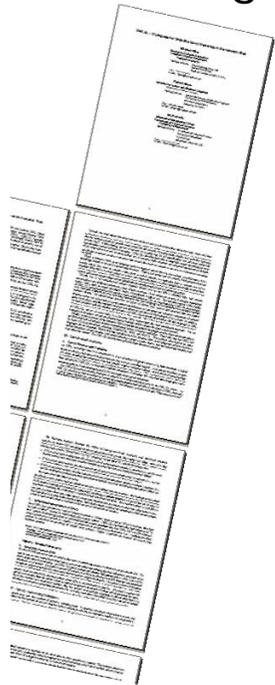
Articles in category "Conference"

There are 15 articles in this category.

A
- ASWC2006

C
- CEC/EEE2006

E
- ECAI2006
- ESWC2006
- ETRICS2006

F
- FOIS2006

I
- I-KNOW2006
- IAWTIC2006
- ICCS2006
- ICSOC2006

K
- KR2006

Using Wikipedia

- Where can
on Semant
languages?
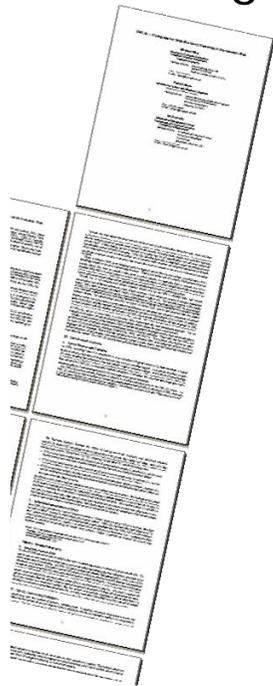
Articles in category "Conference"

There are 15 articles in this category.

| article | discussion | edit | history | protect | delete | move | watch | refresh |

ASWC2006

ASWC2006 is the 1st Asian Semantic Web Conference. It is held from September 3 2006 to September 7 2006 in
aswc2006.org.

Topics

Semantic Web applications and technologies.

more needed

Workshops

The 1st Asian Semantic Web Conference will host seven workshops:

- Making the Semantic Web Services Relevant to the Industry
- Semantic e-science
- Semantic Web Education and Training
- Semantic Technologies, Educational Standards, eLearning ApplicationVocabularies, and OpenCourseWare
- Semantic Web Applications and Tools Workshop
- Web Search Technology - from Search to Semantic Search
- Service Discovery on the WWW

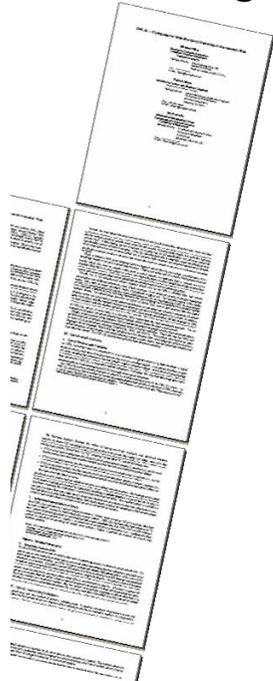The call for papers is open. For more info see http://www.aswc2006.org/workshops.php

Organisation

Marco Ronchetti - Dipartimento di Informatica e Telecomunicazioni - Universita' degli Studi di Trento

Using Wikipedia

- Where can
  on Semant
  languages?

Using Wikipedia

- Where can I publish my paper on Semantic Web query languages?

Category

Yellow = index pages

Green = content pages

Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page
Read page

Using Wikipedia

- Where can I publish my paper on Semantic Web query languages?
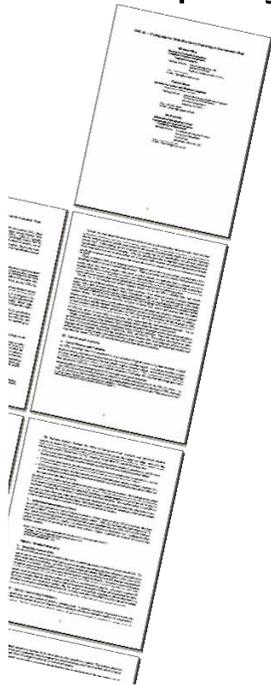
article | **discussion** | edit | history

List of events

- AST2006
- ASWC2006
- CEC/EEE2006
- Collaborative Web Tagging 2006
- Conference
- Data Collection 2006
- Demo session
- ECAI2006
- EON2006
- ESWC2006
- ETRICS2006
- FOIS2006
- HotWeb2006
- I-KNOW2006
- IAWTIC2006
- ICCS2006
- ICSOC2006
- IEDR2006
- IIWeb2006
- IPTV2006
- IRW2006
- IWI2
- IntraWebs 2006

Using Wikipedia

- Where can **I** publish my paper on Semantic Web query languages?
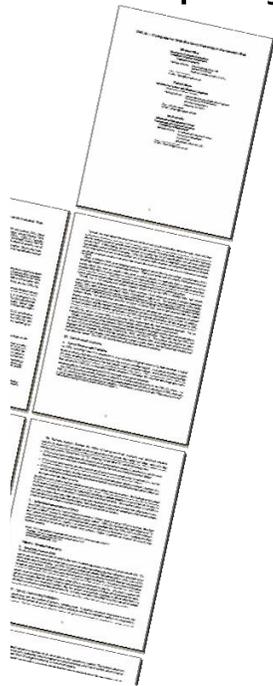
List of events

| article | discussion | edit | history | protect | delete | move | watch |

List of events with paper submission deadline

	paper deadline
AST2006	2006-06-16
ESWC2006	2005-11-28
HotWeb2006	2006-06-15
I-KNOW2006	2006-04-17
IAWTIC2006	2006-07-17
ICSOC2006	2006-06-19
OWLED2006	2006-08-01 09:59:00
PAKM2006	2006-07-10
RoW2006	2006-02-10
RuleML2006	2006-06-05
SEBIZ2006	2006-07-07
VORTE2006	2006-06-16
WONTO2006	2006-06-13

- IRW2006
- IWI2
- IntraWebs 2006

Using Wikipedia

- Where can I publish my paper on Semantic Web query languages?

| article | discussion | edit | history |

List of events

| article | discussion | edit | history | protect | delete | move | watch |

List of events with paper submission deadline

	paper deadline

| article | discussion | edit | history | protect | delete | mov |

List of deadlines between 1st of June 2006 and December 31 2006 on the topic of Semantic Web query languages

There is currently no text in this page, you can search for this page title in other pages or edit this page.
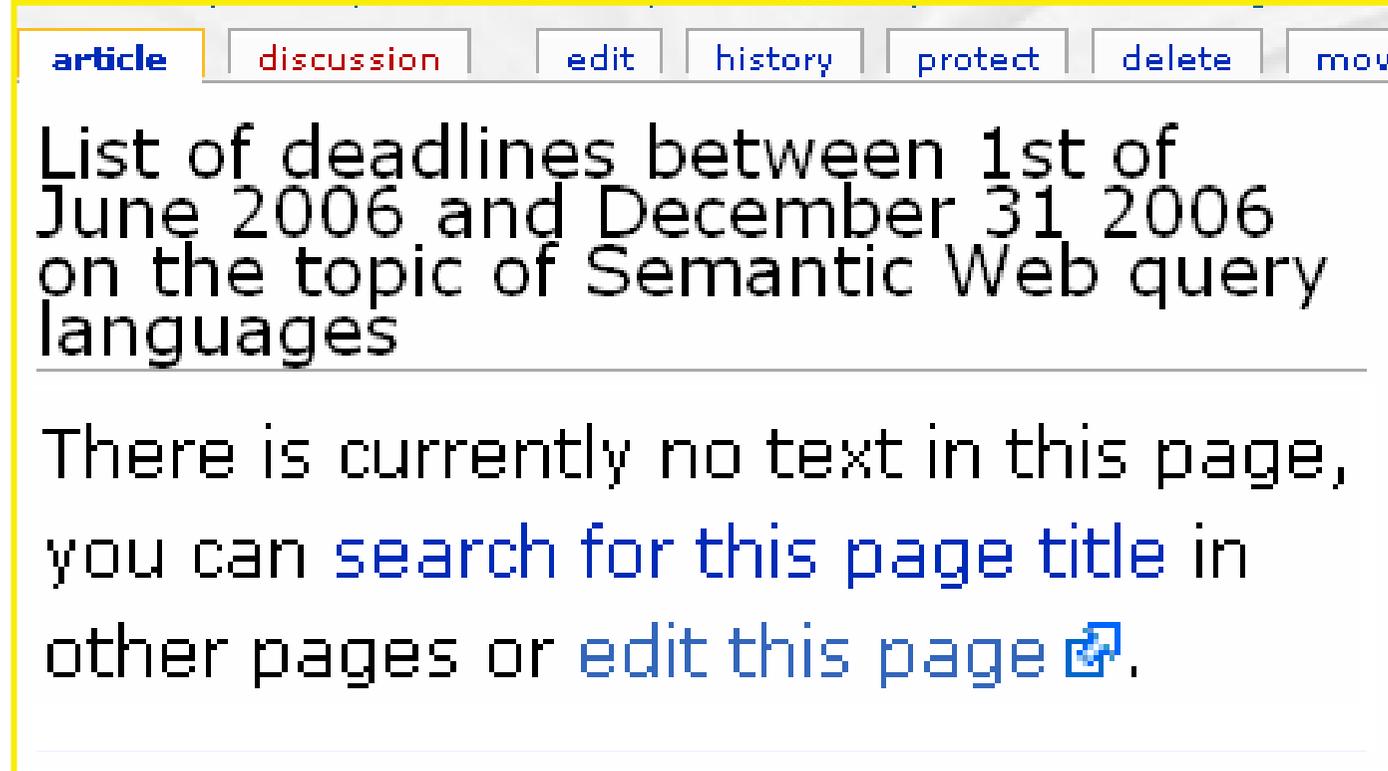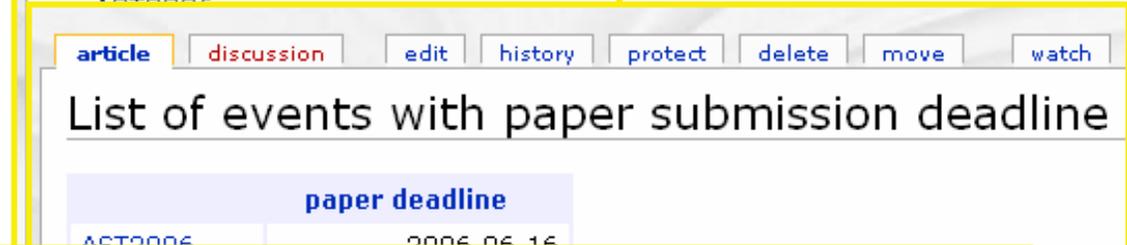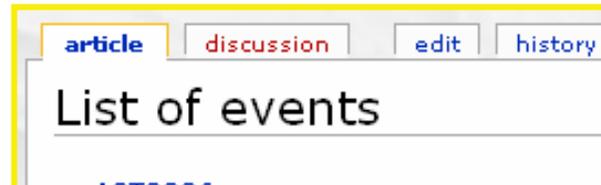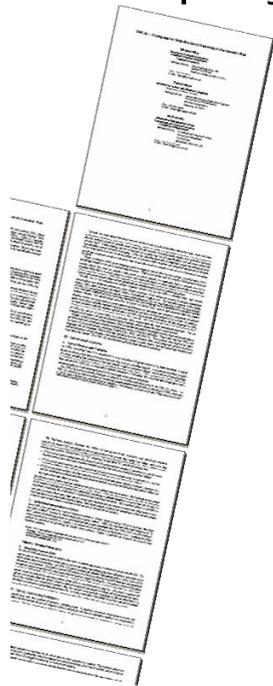
Using Wikipedia

- Where can I publish my paper on Semantic Web query languages?

New Conference

Create page

Update list

Update list

Update list

Update list

Update list

Update list

Update list

Update list

Update list

Update list

Update list

Update list
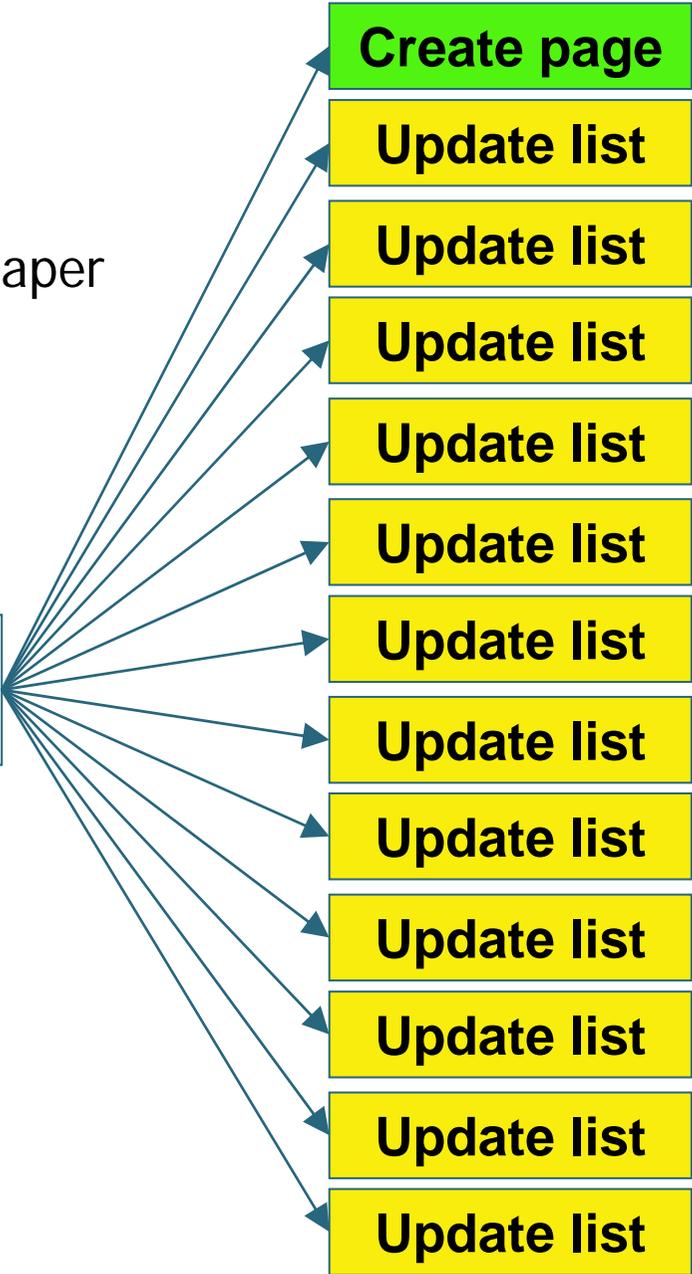
Wikipedia is not perfect

- **Using Wikipedia means reading articles**
  - Manual indexes are no real solution (List of coffee companies, European cities, List of asteroids named after people, …)

- **Inconsistencies between different language versions**
  - Find inconsistencies between different language versions, e.g. Population of Edinburgh (as of 17.05.2006)
    - En: 448,624, no date
    - De: 435.790 in 2005
    - Fr: 448 624 in 2001
    - Dk: 453.670 in 2004

- **Problem: No access to data in articles**

Can the Semantic Web help?
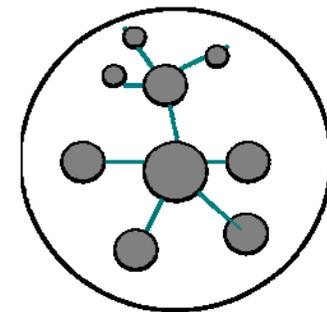
Analysis

- Wikipedia has many users and data,
  but: many manual processes, only text-based search

- Semantic Web has tools for information processing,
  sophisticated queries,
  but: few data

Wikipedia
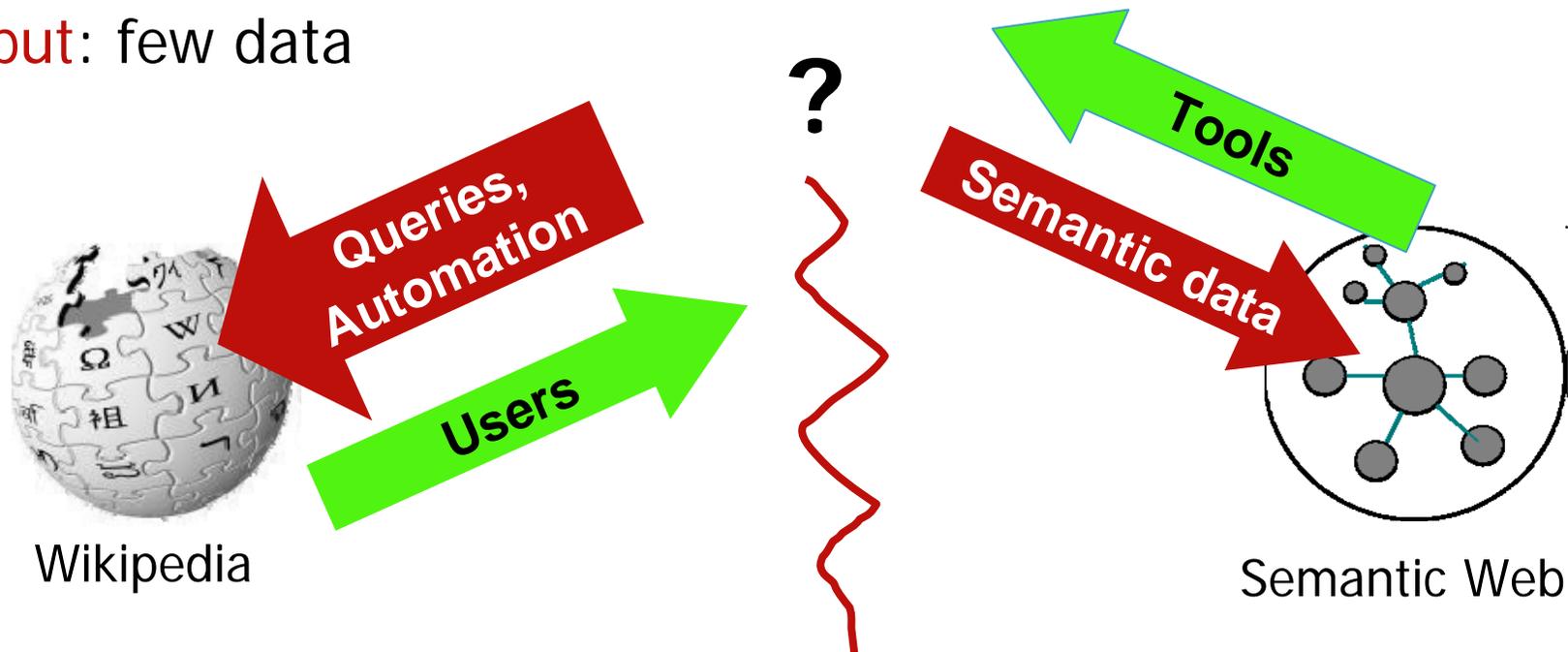
Semantic Web

Goal: Marrying Wikipedia and the Semantic Web

- Wikipedia has many *** s and ***,
  but: many manual pr*** text-based search

- Semantic W*** ation processing,
  sophisticated ***
  but: few data

Queries, Automation

Users

Tools

Semantic data

Wikipedia
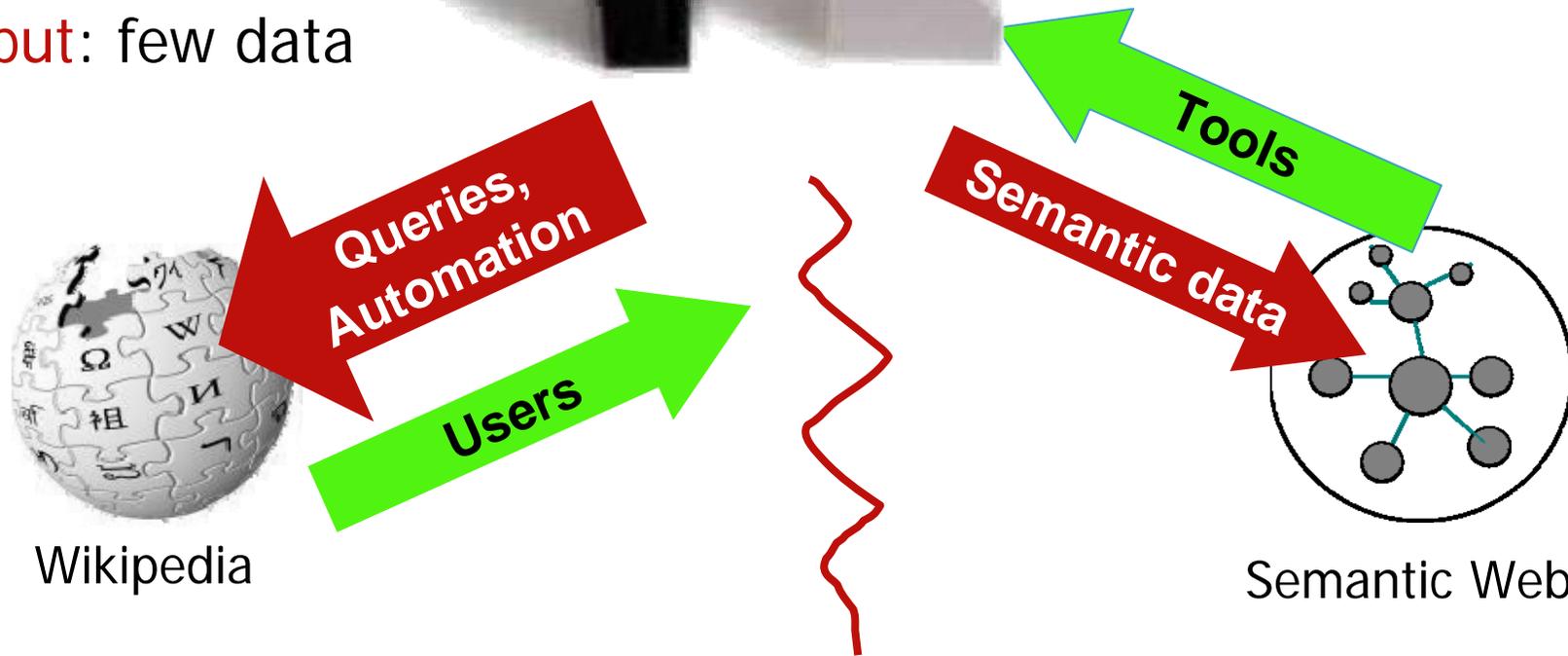
Semantic Web

Requirements for

- **Wikipedia:**
  - Must be very easy to use
  - Must have immediate benefit for the users
    - Lists, Inconsistencies, Better Search
  - Must be efficiently implemented
    - Currently 12,000 hits/second

- **Semantic Web:**
  - Must have export of semantic data
  - Nice to have SPARQL access
  - Must integrate with existing vocabularies

We go to the article on the RuleML2006 conference …

http://wiki.ontoworld.org/wiki/RuleML2006

RuleML2006 (non semantic version)

RuleML2006 is the Second International Conference on Rules and Rule Markup Languages for the Semantic Web. It is held from November 9 2006 to November 10 2006 in Athens, Georgia, USA. For more information, see http://2006.ruleml.org/ .

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navigation
- Main Page
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- Categories

search

AIFB FZI

... and edit it

| article | discussion | edit | history | protect | delete | move |

RuleML2006 is the Second

International

Rules and Ru... ges

for the Semant... eb. It is held

from November 9 2006 to November

10 2006 in [[Athens, Georgia]],

[[USA]].

For more information, see

http://2006.ruleml.org/.

There is already an ordinariy link to the article of „Athens, Georgia"

article | discussion | edit | history | protect | delete | move

RuleML2006 is the Second

International

Rules and Rul

Just say what the relation between this page (RuleML2006) and „Athens, Georgia" is.

for the Semantic. **It is held**

from November 9 2006 to November

10 2006 in [[located in::Athens,

Georgia]], [[USA]].

For more information, see

http://2006.ruleml.org/.

From links …

``` 
… in [[Athens, Georgia]],
[[USA]]. …
```

… to typed links

```
… in [[located in::Athens,
Georgia]], [[USA]]. …
```

From values …

… It is held from November 9 2006 to November 10 2006 in…

… to attributes

… It is held from [[start date:=November 9 2006]] to [[end date:=November 10 2006]] in…

Save.

It looks exactly the same as before

What the humans see, when they scroll down

RuleML2006 is the Second International Conference on Rules and Rule Markup Languages for the Semantic Web. It is held from November 9 2006 to November 10 2006 in Athens, Georgia, USA. For more information, see http://2006.ruleml.org.

---

for demonstration purposes, we have

- RuleML2006 (non semantic verison)
- **RuleML2006 (simple semantic version)**

Relations to other articles — Click + 🔍 to find similar articles.

RuleML2006 (simple semantic version) Has location Athens, Georgia + 🔍

Attributes of RuleML2006 (simple semantic version) — Click + 🔍 to find similar articles.

Start date: 2006-11-09 + 🔍
End date: 2006-11-10 + 🔍

Editing help on relations and attributes   View as RDF

What the humans see, when they scroll down

Relations to other articles — Click + 🔍 to find similar articles.

RuleML2006 (simple semantic version) Has location Athens, Georgia + 🔍

Attributes of RuleML2006 (simple semantic version) — Click + 🔍 to find similar articles.

Start date: 2006-11-09 + 🔍
End date: 2006-11-10 + 🔍

Editing help on relations and attributes   View as RDF

What the machines see

View as RDF: http://wiki.ontoworld.org/index.php/Special:ExportRDF/RuleML2006

```
- <rdf:RDF>
    <!-- reference to the Semantic MediaWiki schema -->
  - <rdf:Description rdf:about="http://smw.ontoware.org/2005/smw#hasArticle">
      <rdfs:isDefinedBy rdf:resource="http://smw.ontoware.org/2005/smw"/>
    </rdf:Description>
  - <rdf:Description rdf:about="http://smw.ontoware.org/2005/smw#Thing">
      <rdfs:isDefinedBy rdf:resource="http://smw.ontoware.org/2005/smw"/>
    </rdf:Description>
    <!-- exported page data -->
  - <smw:Thing rdf:about="http://wiki.ontoworld.org/index.php/_RuleML2006">
      <rdfs:label>RuleML2006</rdfs:label>
      <smw:hasArticle rdf:resource="http://wiki.ontoworld.org/index.php/RuleML2006"/>
      <rdfs:isDefinedBy rdf:resource="http://wiki.ontoworld.org/index.php/Special:ExportRDF/RuleML2006"/>
      <rdf:type rdf:resource="http://wiki.ontoworld.org/index.php/_Category-3AConference"/>
      <rdf:type rdf:resource="http://wiki.ontoworld.org/index.php/_Category-3ATopic_Semantic_Web_query_languages"/>
      <rdf:type rdf:resource="http://wiki.ontoworld.org/index.php/_Category-3ATopic_Semantic_Web_rule_languages"/>
      <rdf:type rdf:resource="http://wiki.ontoworld.org/index.php/_Category-3ATopic_semantic_interoperability"/>
      <rdf:type rdf:resource="http://wiki.ontoworld.org/index.php/_Category-3ATopics_missing"/>
      <relation:Has_PC_member rdf:resource="http://wiki.ontoworld.org/index.php/_Sidney_Bailin"/>
      <relation:Has_PC_member rdf:resource="http://wiki.ontoworld.org/index.php/_Ruediger_Klein"/>
      <relation:Has_PC_member rdf:resource="http://wiki.ontoworld.org/index.php/_Ralph_Traphoener"/>
```

Information resources vs. abstract concepts (http range-14)

RuleML2006 →(HTML Link/header)→ RDF document for RuleML2006

Information resources vs. abstract concepts (http range-14)

Information resources vs. abstract concepts (http range-14)

http://wiki.ontoworld.org/wiki/**RuleML2006**

http://wiki.ontoworld.org/wiki/Special:ExportRDF/**RuleML2006**

RuleML2006

HTML Link/header

RDF document
for RuleML2006

http redirect

smw:hasArticle

http get

rdfs:isDefinedBy

RuleML2006

http://wiki.ontoworld.org/wiki/_**RuleML2006**
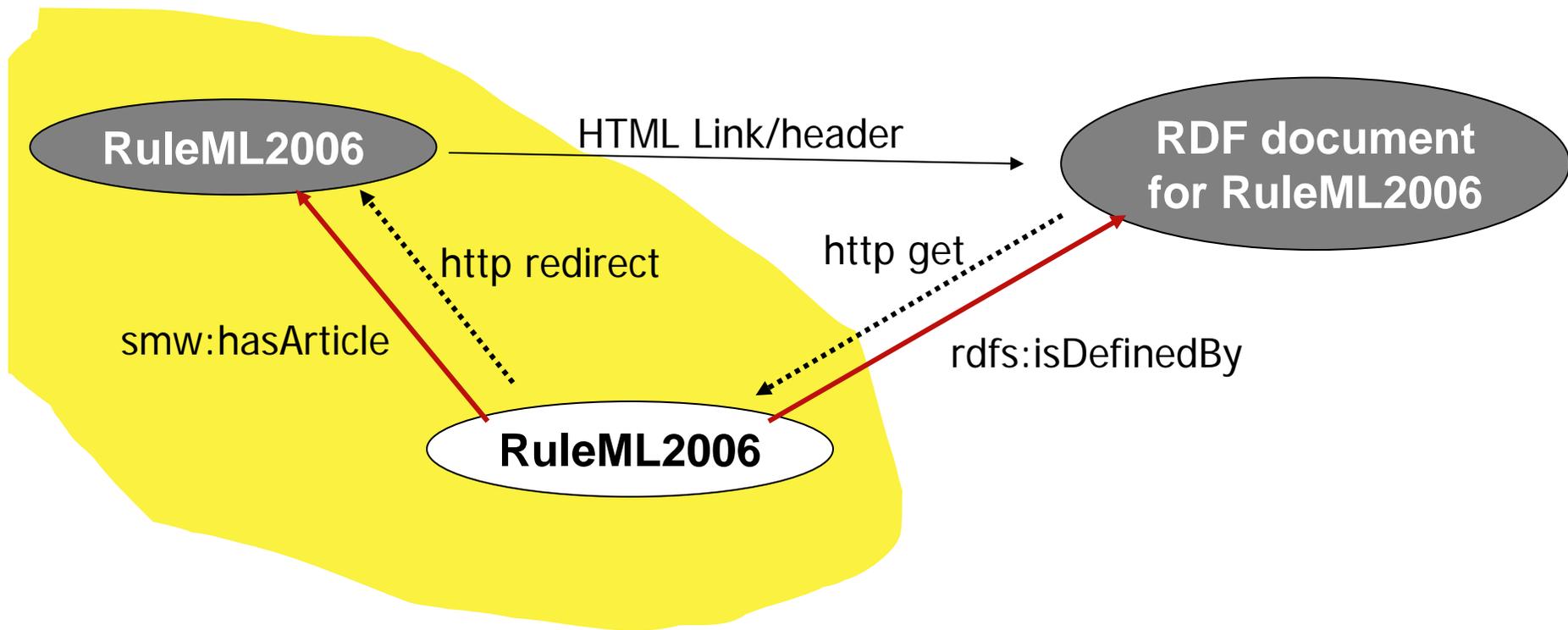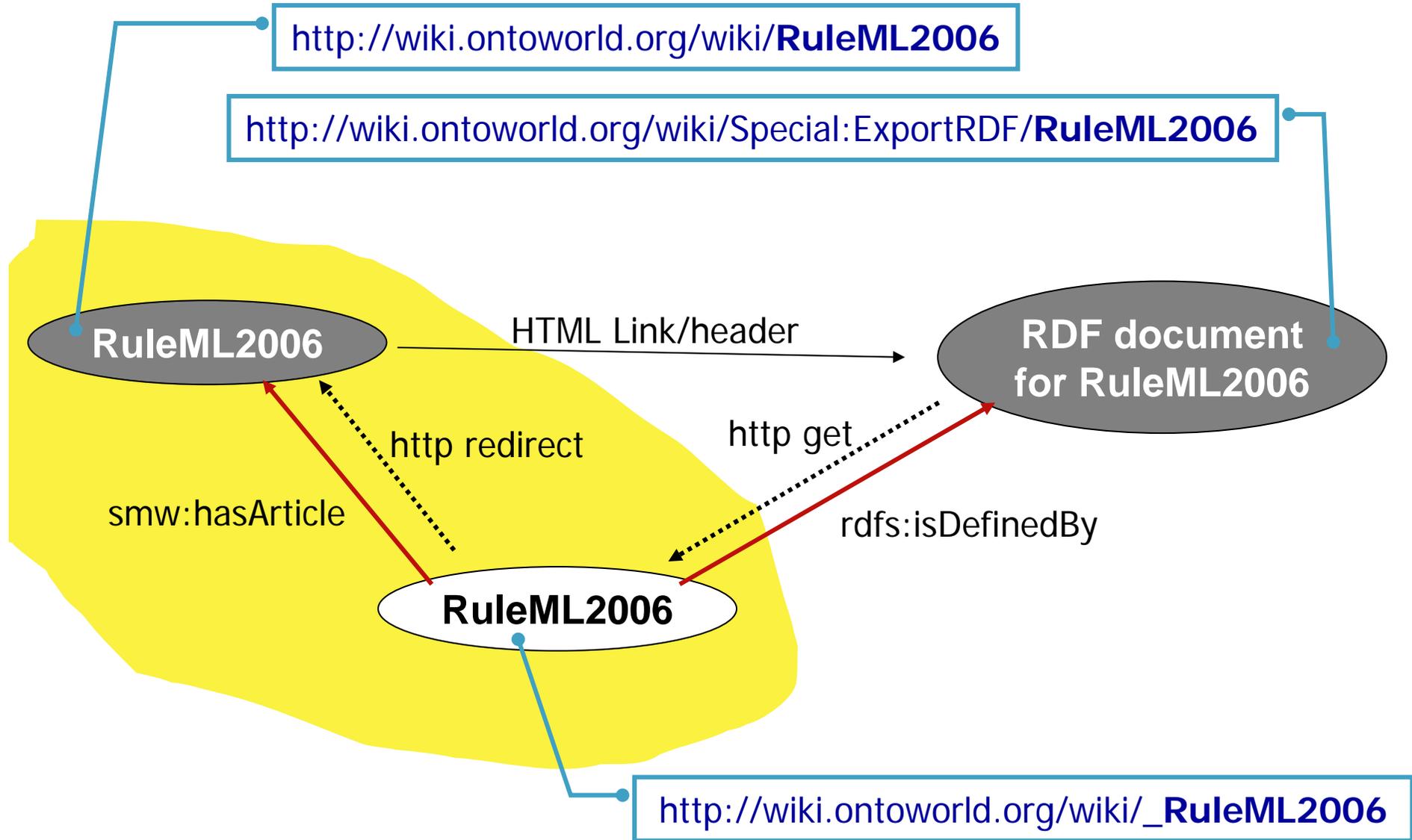
Did I get that right?

- ● Everybody can create any relation or attribute?
  - Yes

- ● Each relation and each attribute have their own wiki-article
  - Relation:located in
  - Attribute:population

- ● Can I have class hierachies, datatypes and all this?

Mapping Wiki Concepts to OWL

Semantic MediaWiki	Syntax	OWL
Link	[[Scotland]]	-
Relation	[[located in::Scotland]] [[contains::Caffeine]]	owl:ObjectProperty
Attribute	[[population:=5,062,011]] [[length:=17 km]]	owl:DatatypeProperty
Category	[[Category:Monarchies]]	owl:Class

Why typed links?

- Cheap annotations
  - Content (links, values) is already there, just mark them up

- Content and annotations are one
  - DRY – don't repeat yourself
  - Metadata doens't get out of sync

- Defined annotation process
  - Authors are annotators

- Locality of annotation

- User interface
  - No new tool to learn
  - Total control over annotations

- Wiki-style: No structure imposed
  - All relations and attributes can be used

Benefits for the Semantic Web

- Wikipedia as URI source (see Workshop IRW2006)
  - Simple social process: Prefix article name with an underscore

- RDF/OWL Data export
  - Header links to RDF file (PiggyBank, OINK, Tabulator)
  - Per page or bulk
  - Everything has an rdf:label
  - All properties have rdfs:isDefinedBy
  - XSD datatypes fully supported

- Semantic Web food chain
  - SPARQL endpoint
  - SPARQL tools (SNORQL)

Benefits for Wikipedians: <ask> for your data

● Inline queries allow for questions like ...
  - ... movies from the 70s starring Sean Connery
  - ... list of events (all conferences and workshops)

```
<ask format="ul" link="all">
      [[Category:Event]]
</ask>
```

Benefits for Wikipedians: <ask> for your data

● Inline queries allow for questions like ...

- ... movies from the 70s starring Sean Connery
- ... list of events with their deadline

```
<ask format="ul" link="all">
      [[Category:Event]]
      [[paper deadline:=*]]
</ask>
```


AIFB
FZI

39
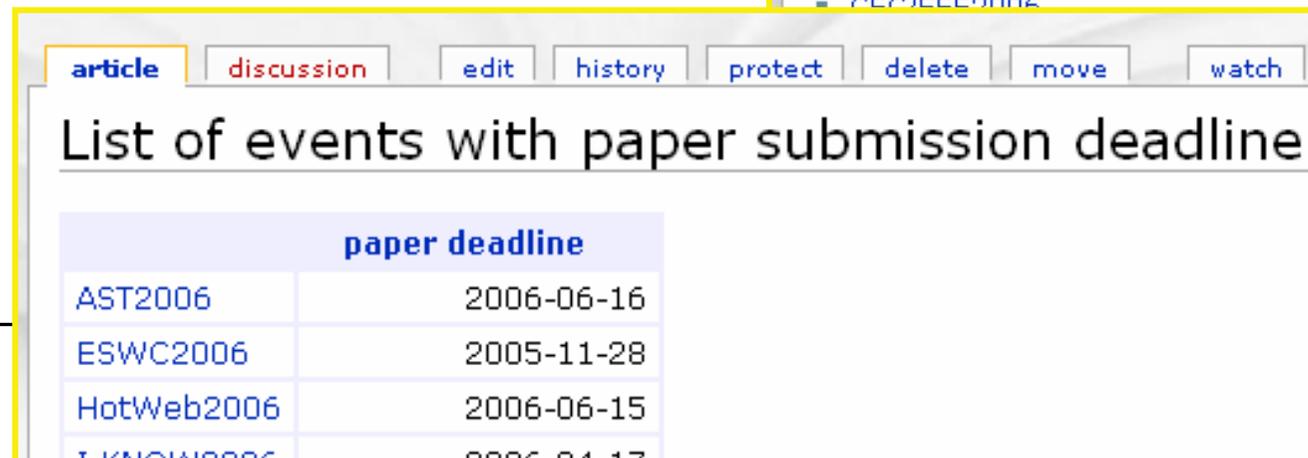
Benefits for Wikipedians: <ask> for your data

```
<ask format="ul" link="all">
 [[Category:Event]]
 [[paper deadline:=>June 1 2006]]
 [[paper deadline:=<December 31 2006]]
 [[title:=*]]
 [[paper deadline:=*]]
 [[Category:Topic Semantic Web query
languages]]

</ask>
```

	title	paper deadline
RuleML2006	Second International Conference on Rules and Rule Markup Languages for the Semantic Web	2006-06-05

Applications

- Automatic tables and lists
  - E.g. Countries sorted by area, population, alphabet, ...

- **Maintenance** with hand crafted checks
  - Does every country have one capital?

- Integration in applications
  - ```
    latte = wikipedia.get("Latte Macchiatto");
    print latte["contains"]
    ```

- Visualization and browsing

- ... And many unexpected ones

Who is using Semantic MediaWiki?

● Our research group

  ■ Wikicompany ⇗ ~ 9.000 pages, 227 user accounts
  ■ The Bible Wiki ⇗ ~ 40.000 pages, 156 user accounts
  ■ WWW2006 Social Wiki ⇗ ~ 40 pages, 34 user accounts
  ■ Semantic eGovernment Community Portal ⇗, ~ 30 pages
  ■ ScubaWiki ⇗, ~ 170 pages, 33 user accounts
  ■ NeOn Wiki ⇗ ~10 pages
  ■ this wiki = Wiki.Ontoworld.org ⇗ ~400 pages, 158 user accounts
  ■ SourceryForge ⇗ ~1864 pages, 272 user accounts

Features

- Linking of concepts with external URIs
  - **[[equivalent URI:= …]]**
  - → owl:equivalentClass, owl:equivalentProperty, owl:sameAs

- OWL import (generates pages from ontology)

- All relations and attributes can be documented

- Re-use of existing Category-system

- Annotating templates for a quick win

- Correct RDF export

→ Flexible system for collaboratively creating content with semantic annotations

Future Work

- Performance

- Performance

- Scalability

- More Expressiveness
  - Transitive, symmetric, and inverse relations

- User Interface
  - Suggested relations and attributes

- Evaluation

Conclusions

- **Annotation for the masses**

- **"Soft" introduction**
  - People are often scared about Semantic Web
  - Semantic features can be ignored

- **Content and metadata are one**

- **Linking to existing ontologies**

- *Create the egg of the chicken-and-egg problem*

Thank You!

Semantic Wikipedia

`[[enhances::`Wikipedia`]]`