

# Semantic Web Engineering

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# Semantic Web Applications

- The Semantic Web is driven by a very active research community.
- First (prototype) applications are already available, to demonstrate the potential of the Semantic Web.
- Similar to the WWW in the mid of the 90ies, the future will show in which direction the Semantic Web will evolve.

# RSS

- RSS is a family of formats for Web syndication used by (amongst other things) news websites and weblogs. The abbreviation is used to refer to the following standards:
  - Rich Site Summary (RSS 0.91) XML
  - RDF Site Summary (RSS 0.9, 1.0 and 1.1) RDF
  - Really Simple Syndication (RSS 2.0) XML
  - Overview available versions:
    - <http://developer.mozilla.org/en/docs/RSS:Version>
- The technology behind RSS allows you to subscribe to websites that have provided RSS feeds, these are typically sites that change or add content regularly.
- The RSS subscription gives you typically a line or two of each article or post along with a link to the full article.
- RSS is supported by Web browsers such as Firefox, Safari, and Opera.
- More info and examples for RSS 1.0 and RSS 2.0:
  - <http://en.wikipedia.org/wiki/Rss>

# Add RSS to your Web page

- RSS feeds are added with the `<link>` element.

- Example:

```
<link rel="alternate"
      type="application/rss+xml"
      title="RDF-Datei"
      href="http://www.heise.de/newsticker/heise.rdf">
```

- It is possible to add more than one RSS feed to a HTML page.
  - For example to provide different categories of RSS feeds.

# RSS Example

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns="http://purl.org/rss/1.0/">

  <channel rdf:about="http://www.xml.com/xml/news.rss">
    <title>XML.com</title>
    <link>http://xml.com/pub</link>
    <description>XML.com features a rich mix ...</description>
    <image rdf:resource="http://xml.com/universal/images/xml_tiny.gif" />
    <items>
      <rdf:Seq>
        <rdf:li resource="http://xml.com/pub/2000/08/09/xslt/xslt.html" />
        <rdf:li resource="http://xml.com/pub/2000/08/09/rdfdb/index.html" />
      </rdf:Seq>
    </items>
  </channel>

  <item rdf:about="http://xml.com/pub/2000/08/09/xslt/xslt.html">
    <title>Processing Inclusions with XSLT</title>
    <link>http://xml.com/pub/2000/08/09/xslt/xslt.html</link>
    <description>Processing document inclusions with... </description>
  </item>
```

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# The Atom Syndication Format 1/2

- Since the missing standard for RSS the IETF proposed the Atom Syndication Format.
- Is not a RDF Application.
- Uses plain XML to define the feed.
- Defined in RFC4287
  - <http://www.ietf.org/rfc/rfc4287.txt>

# The Atom Syndication Format 2/2

## ■ Example

```
<?xml version="1.0" encoding="utf-8"?>
  <feed xmlns="http://www.w3.org/2005/Atom">

    <title>Example Feed</title>
    <link href="http://example.org/" />
    <updated>2003-12-13T18:30:02Z</updated>
    <author>
      <name>John Doe</name>
    </author>
    <id>urn:uuid:60a76c80-d399-11d9-b93C-0003939e0af6</id>

    <entry>
      <title>Atom-Powered Robots Run Amok</title>
      <link href="http://example.org/2003/12/13/atom03" />
      <id>urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</id>
      <updated>2003-12-13T18:30:02Z</updated>
      <summary>Some text.</summary>
    </entry>
  </feed>
```

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# FOAF – Friend of a Friend

- FOAF is also a project for machine-readable modeling of homepage-like content and social networks.
- The heart of the project is its ontology specification which defines some terms that can be used in RDF statements you can make about someone, such as name, gender and various online attributes.
- To make linking possible, one includes uniquely identifiable properties of ones friends (such as SHA1 checksums of their E-Mail addresses).
- FOAF is based on RDF, defined using OWL.
- FOAF homepage: <http://www.foaf-project.org/>
- FOAF Spezifikation: <http://xmlns.com/foaf/0.1/>
- FOAF-a-Matic (create your FOAF description): <http://www.ldodds.com/foaf/foaf-a-matic>



# FOAF Vocabulary Overview

## FOAF Basics

- [Agent](#)
- [Person](#)
- [name](#)
- [nick](#)
- [title](#)
- [homepage](#)
- [mbox](#)
- [mbox\\_sha1sum](#)
- [img](#)
- [depiction](#) ([depicts](#))
- [surname](#)
- [family\\_name](#)
- [givenname](#)
- [firstName](#)

## Personal Info

- [weblog](#)
- [knows](#)
- [interest](#)
- [currentProject](#)
- [pastProject](#)
- [plan](#)
- [based\\_near](#)
- [workplaceHomepage](#)
- [workInfoHomepage](#)
- [schoolHomepage](#)
- [topic\\_interest](#)
- [publications](#)
- [geekcode](#)
- [myersBriggs](#)
- [dnaChecksum](#)

## Online Accounts / IM

- [OnlineAccount](#)
- [OnlineChatAccount](#)
- [OnlineEcommerceAccount](#)
- [OnlineGamingAccount](#)
- [holdsAccount](#)
- [accountServiceHomepage](#)
- [accountName](#)
- [icqChatID](#)
- [msnChatID](#)
- [aimChatID](#)
- [jabberID](#)
- [yahooChatID](#)

## Projects and Groups

- [Project](#)
- [Organization](#)
- [Group](#)
- [member](#)
- [membershipClass](#)
- [fundedBy](#)
- [theme](#)

## Documents and Images

- [Document](#)
- [Image](#)
- [PersonalProfileDocument](#)
- [topic](#) ([page](#))
- [primaryTopic](#)
- [tipjar](#)
- [sha1](#)
- [made](#) ([maker](#))
- [thumbnail](#)
- [logo](#)



# FOAF Example

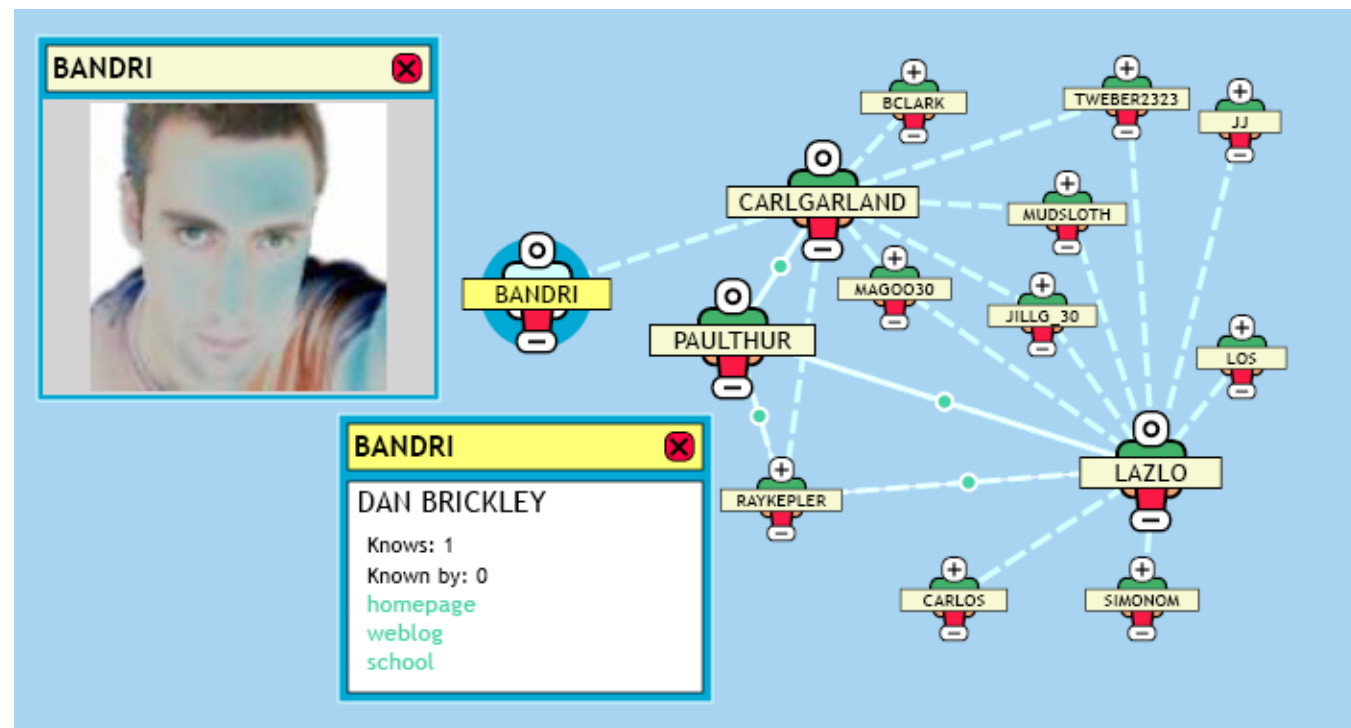
```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
  <foaf:Person>
    <foaf:name>Jimmy Wales</foaf:name>
    <foaf:mbox rdf:resource="mailto:jwales@bomis.com" />
    <foaf:homepage rdf:resource="http://www.jimmywales.com/" />
    <foaf:nick>Jimbo</foaf:nick>
    <foaf:depiction rdf:resource="http://www.jimmywales.com/aus_img_small.jpg" />

    <foaf:interest>
      <rdf:Description rdf:about="http://www.wikimedia.org"
        rdfs:label="Wikipedia"/>
    </foaf:interest>

    <foaf:knows>
      <foaf:Person>
        <foaf:name>Angela Beesley</foaf:name>
      </foaf:Person>
    </foaf:knows>
  </foaf:Person>
</rdf:RDF>
```

# FoafNaut <http://www.foafnaut.org/>

- Interface to visualize the foaf network.
- Needs SVG plug-in (in Mozilla 1.5 included)



# iCal Calendar Ontology 1/2

- iCal originally defined as text format to store calendar events.
- Defined in RFC2445
  - Internet Calendaring and Scheduling Core Object Specification (iCalendar)
- iCal namespace: <http://www.w3.org/2002/12/cal/ical#>
- Ontology definition  
<http://www.w3.org/2002/12/cal/ical>
- Ontology description  
<http://esw.w3.org/topic/RdfCalendarDocumentation>
- Tool to convert from text format into RDF  
<http://dev.w3.org/cvsweb/2001/palmagent/>
- Tool to convert RDF into iCal  
<http://www.w3.org/2002/01dc-nj/toICal.py>

# iCal Calendar Ontology 2/2

- Example iCal RDF Document:

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
        xmlns:ical="http://www.w3.org/2002/12/cal/ical#">

  <ical:vevent>
    <ical:uid>4c3db190-7a9f-11d9-a073-c625e7806422</ical:uid>
    <ical:summary>Simple Event</ical:summary>
    <ical:description>note</ical:description>
    <ical:location>location</ical:location>
    <ical:categories>Business</ical:categories>

    <ical:url>www.semclip.com</ical:url>
    <ical:status>TENTATIVE</ical:status>
    <ical:class>PUBLIC</ical:class>
    <ical:dtstart>2005-09-09T17:30:00</ical:dtstart>
    <ical:dtend>2005-09-09T18:30:00</ical:dtend>

    <ical:alarm rdf:parseType="Resource">
      <ical:trigger rdf:parseType="Resource">
        <ical:duration>-PT10M</ical:duration>
      </ical:trigger>
    </ical:alarm>
  </ical:vevent>
</rdf:RDF>
```

# vCard Ontology

- vCard is a file format standard for personal data interchange, specifically electronic business cards.
- Defines in RFC2426
  - vCard MIME Directory Profile
- vCard namespace:  
`http://www.w3.org/2006/vcard/ns#`
- Ontology definition  
<http://www.w3.org/2006/vcard/ns>
- Old definition, not valid RDF, don't use it!
  - vCard namespace: `http://www.w3.org/2001/vcard-rdf/3.0#`
  - Ontology definition  
<http://www.w3.org/2001/vcard-rdf/3.0#>
  - Ontology description (W3C note)  
<http://www.w3.org/TR/vcard-rdf>

# vCard Ontology Example

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:v="http://www.w3.org/2006/vcard/ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:h="http://www.w3.org/1999/xhtml">
  <v:VCard>
    <v:org rdf:parseType="Resource">
      <rdf:type rdf:resource="http://www.w3.org/2006/vcard/ns#Organization"/>
      <v:organization-name>Data Access Technologies</v:organization-name>
    </v:org>
    <v:fn>Cory B. Casanave</v:fn>
    <v:n rdf:parseType="Resource">
      <rdf:type rdf:resource="http://www.w3.org/2006/vcard/ns#Name"/>
      <v:given-name>Cory</v:given-name>
      <v:family-name>Casanave</v:family-name>
      <v:additional-name>B.</v:additional-name>
    </v:n>
    <v:title>President & CEO</v:title>
    <v:adr rdf:parseType="Resource">
      <rdf:type rdf:resource="http://www.w3.org/2006/vcard/ns#Address"/>
      <v:street-address>8605 Westwood Center Drive</v:street-address>
      <v:locality>Vienna</v:locality>
      <v:region>VA</v:region>
      <v:postal-code>22182</v:postal-code>
      <v:country-name>USA</v:country-name>
    </v:adr>
    <v:tel rdf:resource="tel:+1-123-456-7890"/>
    <v:fax rdf:resource="tel:+1-111-111-1234"/>
    <v:email rdf:resource="mailto:cory@example"/>
  </v:VCard>
</rdf:RDF>
```