Are you afraid of Semantic Web?

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Attention, please… a first question for you:

What is **Semantic Web**?

Any opinions?
Some (possible) answers

Semantic Web is...

– A vision of Sir Tim Berners-Lee (the creator of World Wide Web)
– A transition from “classical” Web to a more structured and flexible one
– A way of describing data, in terms of metadata (data about data) and explain certain relations between resources
They could told you that...

...**Semantic Web** is:

– Just hype – YABW (Yet Another Buzz Word)
– Nothing but the Web 2.0 in disguise
– About “strange” and complex formalisms (e.g., description logic)
– A field of study for “mad” scientists and their flying ideas
– Not applicable in practice (e.g., not interesting for industry)
Wrong!
The truth

**Semantic Web** is already among us!

Semantic Web is a misnomer – in fact, **Data Web** is a more suitable term

– From “opaque” documents to machine understandable data (resources + links between them)

– A plenty of tools, applications, services, expertise available
Ingredients

**RDF (Resource Description Framework)**

- Defining & describing data and relations among data
- Suitable to attach metadata to certain resources
- Data modeling must make the implicit explicit:
  - “PHP is a programming language.”
  - “pOWL is an application written in PHP.”
  - “PHP is easy than C++.”

Some people can understand these assertions. How about the machines?
Ingredients

RDF (Resource Description Framework)
- A triple {subject, property, object} model

  hasWebsite ("#php", "http://www.php.net/")
  isa (#php, #language)
  isWrittenIn ("http://powl.sf.net/", "#php")

- It’s all about triples of URIs
  (Uniform Resource Identifiers)

- Many syntactic representations,
  including XML (Extensible Markup Language)
Ingredients

RDF (Resource Description Framework)

<rdf:RDF>
  <rdf:Description rdf:about="http://pow1.sf.net/">
    <s:Title>PHP-based ontological Web platform.</s:Title>
    <s:Version s:major="1" s:minor="0" />
  </rdf:Description>
</rdf:RDF>

Our defined metadata vocabulary

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Ingredients

OWL (Web Ontology Language)
– Structuring and characterizing resources/relations
  (e.g., “PHP” is an instance of “Language” class)
– Defining logical relationships among resources and the relationships (1-to-1, 1-to-many,...)
– Based on RDF
– Used to denote taxonomies, thesauri, ontologies
Other ingredients

Metadata vocabularies

– DCMI (Dublin Core Metadata Initiative)
– FOAF (Friend Of A Friend)
– DOAP (Description Of A Project)
– SIOC (Semantically-Interlinked Online Communities)

– ...and many others
Other ingredients

<foaf:Person rdf:ID="lucian">
  <foaf:name>Lucian Savluc</foaf:name>
</foaf:Person>

<foaf:Person rdf:ID="sabin">
  <foaf:name>Sabin Buraga</foaf:name>
  <foaf:knows rdf:ID="#lucian" />
</foaf:Person>

  <dc:title>eLiberatica participants</dc:title>
  <foaf:depicts rdf:resource="#lucian" />
  <foaf:depicts rdf:resource="#sabin" />
</foaf:Image>

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Other ingredients

Web syndication via RSS/Atom
– Metadata about blog entries, wiki changes,...
– Syndication as Web service

Query via SPARQL
SELECT ?name ?url
WHERE {
  ?person foaf:name ?name.
  OPTIONAL{ ?person foaf:homepage ?url. }
}
ORDER BY DESC (?name)
Other ingredients

Microformats
- Embedding semantic constructs into XHTML documents
- Using XHTML markups and CSS classes
- Representative: hCard, hCalendar, hReview, hResume, geo, rel-tag, ...
- Useful for semantic tagging (folksonomies)
- Suitable to create mash-ups, too

More: RDFa, XHTML 2.0, ontologies for Web services, RIF (Rules Interchange Format) etc.

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Other ingredients

Microformats

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Tools

• Firefox extensions for retrieving metadata: PiggyBank, Operator, Semantic Radar, Tails
• Editors: Protégé, SWOOP, vi
• Semantic platforms: Jena, KAON, pOWL, Redland
• Semantic wikis: IkeWiki, Semantic MediaWiki, XWiki
• Search for ontologies: Swoogle

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Applications

- Portals: Harper’s Online magazine, Sun’s SwordFish, Vodafone’s Live Mobile Portal
- Agent systems: ADF, Zeus
- Web services: WSMX
- Biology: BioPAX, Haystack, Gene Ontology

- Current directions: Health Care & Life Sciences, Public Administration, Engineering
- Other initiatives: semantic search, semantic desktop, semantic mash-ups, semantic grid,...
- Semantic anything?!
Layered architecture of the Semantic Web (Berners-Lee, 2006)
This is just the beginning...
Places to visit...

- Web Consortium: [www.w3.org](http://www.w3.org)
- PlanetRDF: [www.planetrdf.com](http://www.planetrdf.com)
- Microformats: [www.microformats.org](http://www.microformats.org)
Attention, please… a second question for you:

Are you afraid of Semantic Web?

Thank you!
Acknowledgment

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