The Semantic Web Landscape

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Semantic Web – what it is and isn’t

Lot’s of cool technologies that could be seen as “Semantic”:

- Powerset
- Siri
- WolframAlpha
- Google Translate
- IBM Watson

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What does “Semantic” mean?

Definition of SEMANTIC
1: of or relating to meaning in language

What is the meaning of meaning?

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What is the “Web”? 

A way to share **documents** on a global scale. Anyone can **read** any **document** on the web.
What is the "Semantic Web"?

A way to share data on a global scale. Anyone can query any data on the web all.
Problems you can solve on the web

- **Search** (help me find what I am looking for)
- **Comparison** (help me compare two things)
- **Route planning** (get me from here to there)
- **Diagnosis** (what’s wrong with me?)
- **Measurement** (how much? How far?)
- **Broadcast** (let everyone know)
- …

Semantic Web doesn’t do any of these – it allows data to be shared, to facilitated these functions and more
Example: search

An index to guide the search

Stuff to search through (information, products, services, ...)

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Example: search

- Text analytics?
- Link analytics?
- Crowdsourcing?
- Self-annotation?
- Expert curation?

Where does that index come from?
Sharing data on the Semantic Web
Semantic Web description of Mathematics (abridged)
Semantic Web description of Mathematics (abridged)

Semantic Web – emphasis is on the “WEB”

Cambridge

studied at

Wiles

solved

Sphere Packing

about

Geometry

Arithmetic

Fermat’s Theorem

about
Semantic Web – emphasis is on the “WEB”
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Semantic Web – emphasis is on the “WEB”
On the Semantic Web, metadata is as easy to manage as data
Example: Structured Search

“Find me someone who has ‘Semantic Web’ as part of their job title”

What kind of index would we need to answer this sort of question?
Suppose we all agreed on how to represent information about a person. Suppose that we all used that to mark up our pages. Now we could search all the information about all the people in a uniform manner.

This is the basis of microformats and schema.org
What if there are competing formats? Easy – get the other guy to change!! … or have a way to talk about how they relate.
**What is an “Ontology”?**

- **Sharable, modular piece of metadata.**
  - Sharable = referenceable from other places
  - Modular means self-contained
  - Metadata describes other data

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<th>Name</th>
<th>Title</th>
<th>First, middle, last</th>
</tr>
</thead>
<tbody>
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<td>Position</td>
<td>Organization</td>
<td>Title</td>
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<td>City, State, Country, Zip Code</td>
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<td></td>
<td>Phone number</td>
<td>Work, Home, mobile</td>
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<th>First, middle, last</th>
</tr>
</thead>
<tbody>
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<td>Division, Job Description</td>
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<td></td>
<td>Address</td>
<td>Street address, City, County, Country, Post code</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phone number</td>
<td>Work, Home, mobile</td>
<td></td>
</tr>
</tbody>
</table>
Web of metadata

Ontologies refer to one another just as web pages do
Semantic Agents on the web

- Agents provide services for people
- Agents read data from pages
- Agents merge data from multiple pages
- Examples:
  - Mashups
  - Auto-fill forms
  - Facebook “like” or “share” buttons
Life in the Data Cathedral

- Everything follows strict rules
- Only civilized things allowed in
- Everything under control
Living in the data wilderness

• Caveat emptor
• Data is in multiple formats, multiple schemas, unknown quality
• The web grew as a wilderness
Two Strategies for How The Web was Won

1. First, get everything into the same form, get everyone to agree, get them all into the Cathedral. Then, data exchange is easy.

2. Learn to live in the wilderness, making use of the valuable things there, while dealing with the dangerous ones.