The Semantic Web:
Too clever for its own good?

Or: The 7 (f)laws of the Semantic Web

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Presented by Daniel Zambonini (dan@boxuk.com)
What we’ll cover

- Introduction
  - Scope
  - What is the Semantic Web?
  - What difference will it make?
- Semantic Web
  - Past
  - Present
    - The 7 (f)laws of the Semantic Web
  - Future
- Summary
Introduction: Scope of this talk

- Social and Political issues, less technical.
- Critical, with a tiny dash of optimism.
Introduction: What is the Semantic Web?

- The Semantic Web IS NOT:
  - A replacement for, or evolution of the current Web.
  - Another attempt at Artificial Intelligence.
  - Semantic -- machines will not be able to understand, or reason from, the data.
Introduction: What is the Semantic Web?

- The Semantic Web IS:
  - A web of **linked data** under the current (hyper) linked resources.
  - Not built from scratch -- most of this data already exists.
    - But needs to be converted to a new format.
Introduction: What is the Semantic Web?

- It might be used for:
  - Finding information/services
  - Metadata
  - An automation infrastructure
  - Annotation
  - Data mining
  - …
Introduction: What difference will it make?

Your guess is as good as mine.
Semantic Web: Past

1983: Internet
1992: Web/HTML
1998: XML
1999: RDF
2000: XHTML
2003: OWL
200X: Semantic Web

Key:
- Internet
- Web/HTML
- XML
- RDF
- XHTML
- OWL
- Semantic Web

1995: Yahoo
2000: Google
Semantic Web: Past

- Metadata (attribute/value pair)
  - author = Jane Bloggs
  - created = 12 March 2006

  - BCS Homepage -> author -> Jane Bloggs
  - BCS Homepage -> created -> 12 March 2006
URIs provide standard terms, RDF/XML a standard format.

```xml
<rdf:Description rdf:about="http://people.org/Bloggs_Jane#9">
  <foaf:birthPlace rdf:resource="http://geo.org/UK/Oxford" />
  <foaf:birthDate>1965-09-25</foaf:birthDate>
</rdf:Description>
```
Semantic Web: Past

- UK is part of Wiltshire
- Dan Z has offices in the UK
- Dan Z has been to Swindon
- Dan Z is presenting at an event
- Dan Z works for BCS
- BCS is part of the UK
- BCS is the headquarters of Box UK
- Box UK is redeveloping a site in Swindon
Semantic Web: Past

- **RDF Schema** - basic vocabularies:
  - continent
  - country
    - county
      - city
      - town
  - relative
    - sibling
      - brother
      - sister

- **OWL** - complex ontological concepts, including:
  - Cardinality
  - Transitivity
  - Equivalence
  - Unions, Intersections and Disjoint
Semantic Web: Present

- 100+ Semantic Web applications, covering:
  - Catalogue/Thesaurus Management
  - Data Integration
  - Knowledge Management
  - Knowledge Creation
  - Discovery & Selection
  - Annotation & Enrichment
  - Personal Information Management
  - Media & Content Metadata
  - Syndication
  - Semantic Indexing

Technologies:
- Mozilla
- EARL
- Annotea
- Edutella
- MusicBrainz
- XMP
Semantic Web: Present
Semantic Web: Present
Semantic Web: Present

[Image of a webpage displaying a map and search results for restaurants and movies]
So how much RDF data is on the web?

- About 4 million RDF files
  - FOAF: About 300,000
  - RSS: Most of the remaining

(Ballpark estimates, using google.com)
Interest in the Semantic Web flat-lined a long time ago.

(source: google.com/trends)
Books in Amazon.com under *Computers & Internet* category.
Semantic Web: Present

Blogs by subject, per day, for last year (source: technorati.com)
The 7 (f)laws of the Semantic Web.
Not all Semantic Web data are created equal.
The 1st (f)law of the Semantic Web

The 2\textsuperscript{nd} (f)law of the Semantic Web

A technology is only as good as developers think it is.
The 2nd (f)law of the Semantic Web

- Most successful technologies can be learnt from example files. RDF/XML is a bit trickier.

- The Semantic Web community is (or appears to be) academic, inward-looking and uninviting.
“IMHO, RDF/RDFS/OWL are not well suited to proving validity, due to the open world assumption. There are usually too many possibilities to prevent any incorrect interpretations.

On the other hand, it does just fine with consistency. The only trick is that people are often surprised that many constructs can be considered consistent... again due to the open world assumption. As an example, I first learnt this when I discovered that (under OWL) a predicate with cardinality of 1 for class C can be used multiple times on a single instance of C.”

(A recent post from the “general interest” W3C Semantic Web mailing list)
The 2nd (f)law of the Semantic Web

- "I've developed an overall impression of dismay at the latest RDF model semantics specs."

- "I get the feeling that in trying to achieve the ontological purity needed for the Semantic Web, it's starting to leave the desperate hacker behind."

(A respected developer and blogger)
The 2nd (f)law of the Semantic Web

- "I've lost a lot of my interest in working with the Semantic Web lately, and I don't see it coming back anytime in the near future."

- “…frustration with evangelizing being part of the process of proceeding in the Semantic Web world. Every time I take a step forward with some code, I find another 5 steps I have to take back in order to defend my position and the way I've done it."

(A Semantic Web developer and blogger)
The 2nd (f)law of the Semantic Web

- In response to these complaints:

  "Time to stop apologizing for the spec. Time to stop bemoaning the complex bits. Don’t like it, don't use it."

[Author of one of the mainstream RDF books]
The 3rd (f)law of the Semantic Web

Complex Systems must be built from successively simpler systems.
The 3rd (f)law of the Semantic Web

- 'complexity'
- 'knowledge'

Web 2.0 Application
- AJAX, DHTML
- HTML, CSS, Javascript, XML

Semantic Web Application
- Agents, Interference, Ontologies
- RDF/XML, SPARQL, RDF Schema, URI

www.boxuk.com
The 4\textsuperscript{th} (f)law of the Semantic Web

A new solution should stop an obvious pain.
The 4th (f)law of the Semantic Web

- Let’s take another look at what the Semantic Web could provide:
  - Finding information/services
  - Metadata
  - An automation infrastructure
  - Annotation
  - Data mining
The 5th (f)law of the Semantic Web

People aren’t perfect.
The 5th (f)law of the Semantic Web

- Creating metadata and classifications is difficult.
- People are biased and fallible.
- People have different contexts, different needs.
The 6th (f)law of the Semantic Web

You don’t need an Ontology of Everything.

But it would help.
The 7th (f)law of the Semantic Web

Philanthropy isn’t commercially viable.
Semantic Web: Future

- W3C currently have specifications for:
  - RDF Model
  - RDF/XML
  - RDF Schema
  - OWL

- And are working on (‘Phase 2’):
  - Semantic Web for Multimedia Content
  - RIF (Rule Interchange Format)
  - SPARQL
  - Semantic Web Services
  - Trust Policies
  - …

"... I have seen lots of total crap work that was based on specs. It's the single worst way to write software, because it by definition means that the software was written to match theory, not reality."

Linus Torvalds
Semantic Web: Future

- **Opportunities:**
  - Microsoft could help build the Semantic Web developer community.
  - Google could release a Semantic Web search.
  - Or maybe the underdogs/competitors:
    - Adobe
    - Yahoo!

- **Threats:**
  - Semantic Web specifications collapse under their own weight.
  - Resolution of ‘Trust’ issue.
Semantic Web: Future
Semantic Web: Future

11pm. I Forgot My Wife’s Birthday!

Barry, buy 2 tickets for “Cats” in London

"ZZZZZZZZZZZZZ...."

The next morning...

"Thanks Barry!"
Semantic Web: Future

What you can do:

- Expose your data as RDF
- If you need help, ask – make it clear that you WANT to participate.
- Educate and inform on what the Semantic Web is/could be.
Summary/Conclusions

- Huge potential, huge - but not yet critical - problems.

- The basic technologies are ready.
  - **The good news**: You just have to save your data in a different format.
  - **The bad news**: It’s a pretty complicated format.

- And you probably won’t see any effect. Not for a while, anyway.

- But it could be amazing!
Summary/Conclusions

dan@boxuk.com
www.boxuk.com

• www.foaf-project.org/
• search.yahoo.com/cc
• haystack.lcs.mit.edu/
• simile.mit.edu/piggy-bank/