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OWL: Path to Massive Deployment

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Web-Scale Deployment

- ❑ Number of pages

- ❑ Amount of Data

- ❑ Awareness

- “I’m a Web Developer” “Have you heard of X?”
- For X = Java, Ruby, HTML5, Semantic Web, RDF, SPARQL, Jena, OWL, Linked data, ...



Facebook Open Graph Protocol

The image shows a screenshot of a web browser displaying the website <http://workingontologist.org/>. The website features a navigation bar with 'HOME', 'examples', and 'errata'. A prominent banner for the book 'SEMANTIC WEB for the WORKING ONTOLOGIST' by Dean Allemang and Jim Hendler is visible. A blue circle highlights the book cover and title. Below the banner, a text block describes the book, and a 'Like' button is shown with '52 likes'. Another blue circle highlights the 'Like' button and '52 likes'.

Overlaid on the bottom right is a screenshot of the Facebook page for 'Semantic Web for the Working Ontologist'. A blue arrow points from the book cover on the website to the Facebook page. Another blue arrow points from the 'Like' button on the website to the Facebook page's 'Like' button. The Facebook page shows the page name, a search bar, and various navigation options. The main content area displays the page name and a post about the book's second edition.

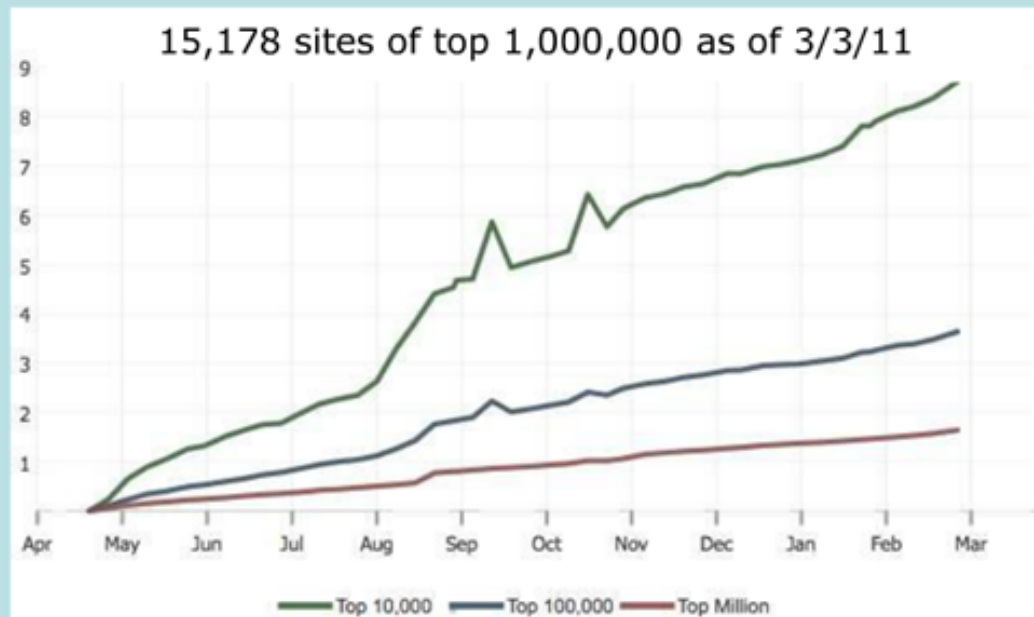


Facebook and OGP



Example: OGP use growing quickly
Facebook incentivizing use of RDFa like buttons

Tetherless World Constellation



Oct 2010: FB reports RDFa is ~ 10-15% of > 3,000,000 likes per day!
Facebook is encouraging developers to use the RDFa version

Source: Jim Hendler



OGP and Simplicity

~~<meta property="og:latitude" content="37.416343"/>~~

~~<meta property="og:longitude" content="-122.133013"/>~~ **geo:lat, geo:long?**

~~<meta property="og:title" content="The Rock"/>~~

<meta property="og:type" content="movie"/>

dc:title ?

<meta property="og:url" content="http://www.imdb.com/title/
tt0117500"/>

foaf:depiction ?

~~<meta property="og:image" content="http://ia.media-imdb.com/
rock.jpg"/>~~

<meta property="og:site_name" content="IMDb"/>

<meta property="fb:admins" content="USER_ID"/>

rdfs:description ?

skos:definition ?

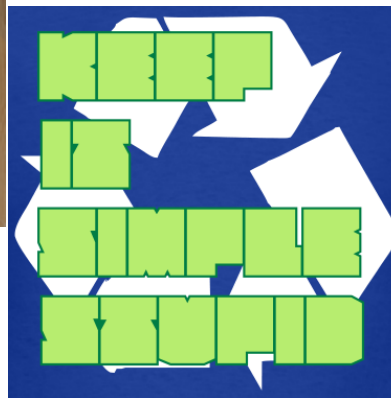
~~<meta property="og:description" content="A group of U.S. Marines,
under command of a renegade general, take over Alcatraz and
threaten San Francisco Bay with biological weapons."/>~~



KISS



KISS
keep it simple ...





Good Relations

- ❑ Vocabulary for eCommerce
- ❑ Lets vendors describe their products, services, prices, etc.
- ❑ Makes this data mergeable, dynamic, queryable, etc.

Semantic SEO

If you add GoodRelations to your Web page, both Google and Yahoo will show a rich preview of your products in the search results.

[Read more](#)

<http://www.onlineshop>

GoodRelations T-Shirt
★★★★★ 20 reviews - \$29.99 - In stock

This is how your product will show up in the Google results if you include GoodRelations markup in your Web pages.

www.goodrelations-vocabulary.org/t-shirt/ - [Cached](#) - [Similar](#)

Source: Martin Hepp at <http://purl.org/goodrelations>



OWL Success Stories: Good Relations

| site | pages | triples |
|---------------|------------|---------------|
| overstock.com | 1,000,000 | 100,000,000 |
| CSNstores* | 2,000,000 | 20,000,000 |
| BestBuy* | 500,000 | 5,000,000 |
| Amazon* | 20,000,000 | 4,000,000,000 |
| Eurobau* | | 60,000,000 |
| O'Reilly* | 25,000 | 2,000,000 |
| Bitmunk* | | 11,000,000 |

*Source: Good Relations wiki



SKOS (Simple Knowledge Organization System)

- ❑ System for managing controlled vocabularies
- ❑ 28 Vocabularies on the W3C page, including:
 - Dewey decimal system
 - Library of Congress
 - United Nations Agrovoc
 - Many more not on this page . . .

- ❑ Each vocabulary is referenced from sometimes thousands of sites



Open Biological and Biomedical Ontologies (OBO)

- ❑ Over a hundred curated models
- ❑ Some are quite large
 - CHEBI > 1 million triples
 - Gene Ontology ~ 2.5 million triples
- ❑ Over 100 million triples – that’s getting to scale!







The Open Biological and Biomedical Ontologies

[Ontologies](#)
[Resources](#)
[Participate](#)
[About](#)

The OBO Foundry is a collaborative experiment involving developers of science-based ontologies who are establishing a set of principles for ontology development with the goal of creating a suite of orthogonal interoperable reference ontologies in the biomedical domain. The groups developing ontologies who have expressed an interest in this goal are listed below, followed by other relevant efforts in this domain.

In addition to a listing of OBO ontologies, this site also provides a statement of the OBO Foundry principles, discussion fora, technical infrastructure, and other services to facilitate ontology development. We welcome feedback and encourage participation.

Click any column header to sort the table by that column. The  link to the term request trackers for the listed ontologies.

| OBO Foundry ontologies | | | | |
|---|--------------------|---------------|--|---------------------|
| <u>Title</u> | <u>Domain</u> | <u>Prefix</u> | <u>File</u> | <u>Last changed</u> |
| Biological process | biological process | GO | gene_ontology_edit.obo  | 2011/06/03 |
| Cellular component | anatomy | GO | gene_ontology_edit.obo  | 2011/06/03 |
| Chemical entities of biological | biochemistry | CHEBI | chebi.obo  | 2011/05/14 |




OWL Utilization in common resources

| | Good Relations | SKOS | OBO (CHEBI) |
|--------------------|----------------|------|-------------|
| AnnotationProperty | X | X | X |
| Class | X | X | X |
| DatatypeProperty | X | X | |
| DeprecatedProperty | X | | |
| FunctionalProperty | | X | |
| ObjectProperty | X | X | X |
| Ontology | X | X | X |
| Restriction | | | X |
| SymmetricProperty | X | X | |
| TransitiveProperty | X | X | X |
| disjointWith | X | X | |
| inverseOf | X | X | |
| onProperty | | | X |
| someValuesFrom | | | X |
| unionOf | X | X | |
| versionInfo | X | | |



Optional Axioms in Good Relations – in SPARQL


Log in

navigation

- Home
- Recent changes

search

page discussion

GoodRelationsOptionalAxiomsAndLinks

Contents [hide]

1 Useful Rules, Axioms, and Links for the GoodRelations Ontology

1.1 Recommended Default Rules

1.1.1 Product Models

Expand gr:includes

The gr:includes property is a shortcut for the many cases in which the product includes just one item. By that you spare the effort for an additional gr:TypeAndQuantityNode or even the gr: ProductOrServicesSomeInstancesPlaceholder node. However, when querying, you should search for the full pattern, or both. In order to expand all usages of gr:includes to the full pattern, activate the following TWO (!) SPARQL CONSTRUCT rules

Note: In the 2010-09-16 service update of GoodRelations, the usage of gr:includes is being expanded to links between gr:Offering and gr:ProductOrServiceModels, which can drastically reduce the markup effort.

SPARQL CONSTRUCT Rule #1:

```

# Expand gr:includes between gr:Offering and gr:ProductOrServicesSomeInstancesPlaceholder (c
PREFIX gr: <http://purl.org/goodrelations/v1#>

CONSTRUCT {
  ?o gr:includesObject _:n .
  _:n rdf:type gr:TypeAndQuantityNode.
  _:n gr:amountOfThisGood "1.0"^^xsd:float.
  _:n gr:hasUnitOfMeasurement "C62"^^xsd:string.
  _:n gr:typeOfGood ?p.}

WHERE
{
  ?o rdf:type gr:Offering.
```



Namespaces used in Overstock.com product pages

- ❑ The actual overstock.com product pages include commerce data about their products. This data uses:
 - OGP (image etc.)
 - GR (Good Relations)
 - FOAF (depiction)
 - RDFS (comment and label)
 - RDF review vocabulary (<http://vocab.org/review/terms.html>)
 - RDF data vocabulary (<http://rdf.data-vocabulary.org/>)
 - Facebook markup (<http://www.facebook.com/2008/fbml#>)

- ❑ OWL is missing – and that’s a good thing!

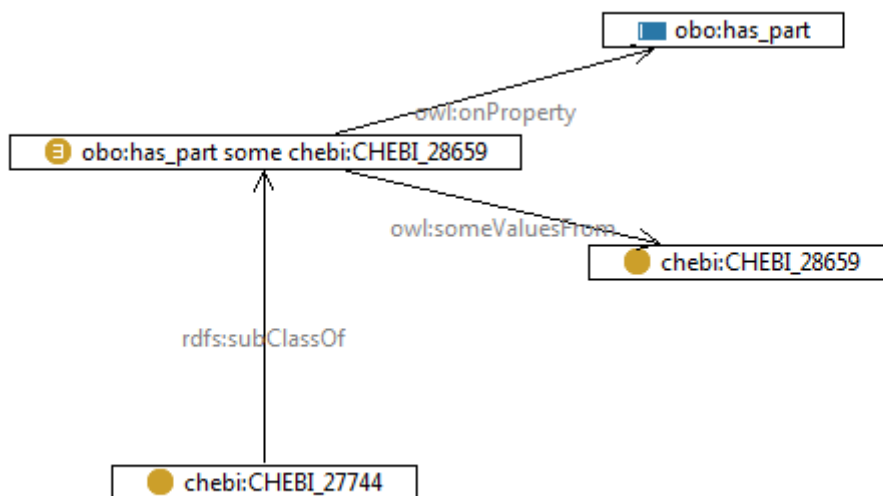


Using Good Relations doesn't require learning OWL



How about OBO?

How do I say “glyphosate is made of phosphorus” in CHEBI?



“glyphosate is a subclass of the set of things that have some part that is phosphorus”

figure made with TopBraid Composer™



How to Make \$\$\$ in OWL Today

- ❑ Make OWL look really hard (“Drinking from a firehose”
“Very Complicated”)
 - Sell a training course to help people out
 - Write a book about OWL
 - Sell OWL consulting (“don’t try this at home!”)



How to Make \$\$\$ in OWL Tomorrow

OWL must not be mysterious



Who is interested in the Semantic Web?

- Database architect
- Java programmer
- Library scientist
- Data modeler
- IT Specialist
- Enterprise Architect
- Knowledge Manager
- Scientist (geographer, chemist, geologist, linguist)
- Entrepreneur
- Vocabulary Specialist
- Product manager
- Systems Engineer
- Consultant
- Software Engineer
- Taxonomist



What is hard about OWL?

- ❑ Open World Assumption
 - Data applications have all been closed world
 - Usually I want to use that data again anyway
- ❑ Domain and Range
- ❑ Inferencing vs. Processing
 - Declarative vs. procedural
 - Programmers want control
 - Data folks want queries
- ❑ Logic
 - allValuesFrom can mean “none”



“all” can mean “none”

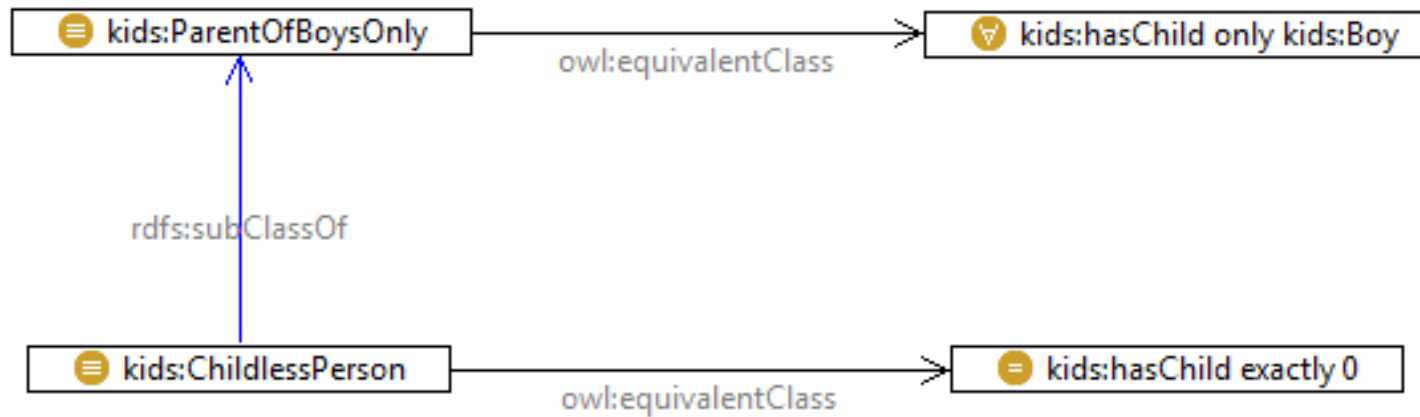
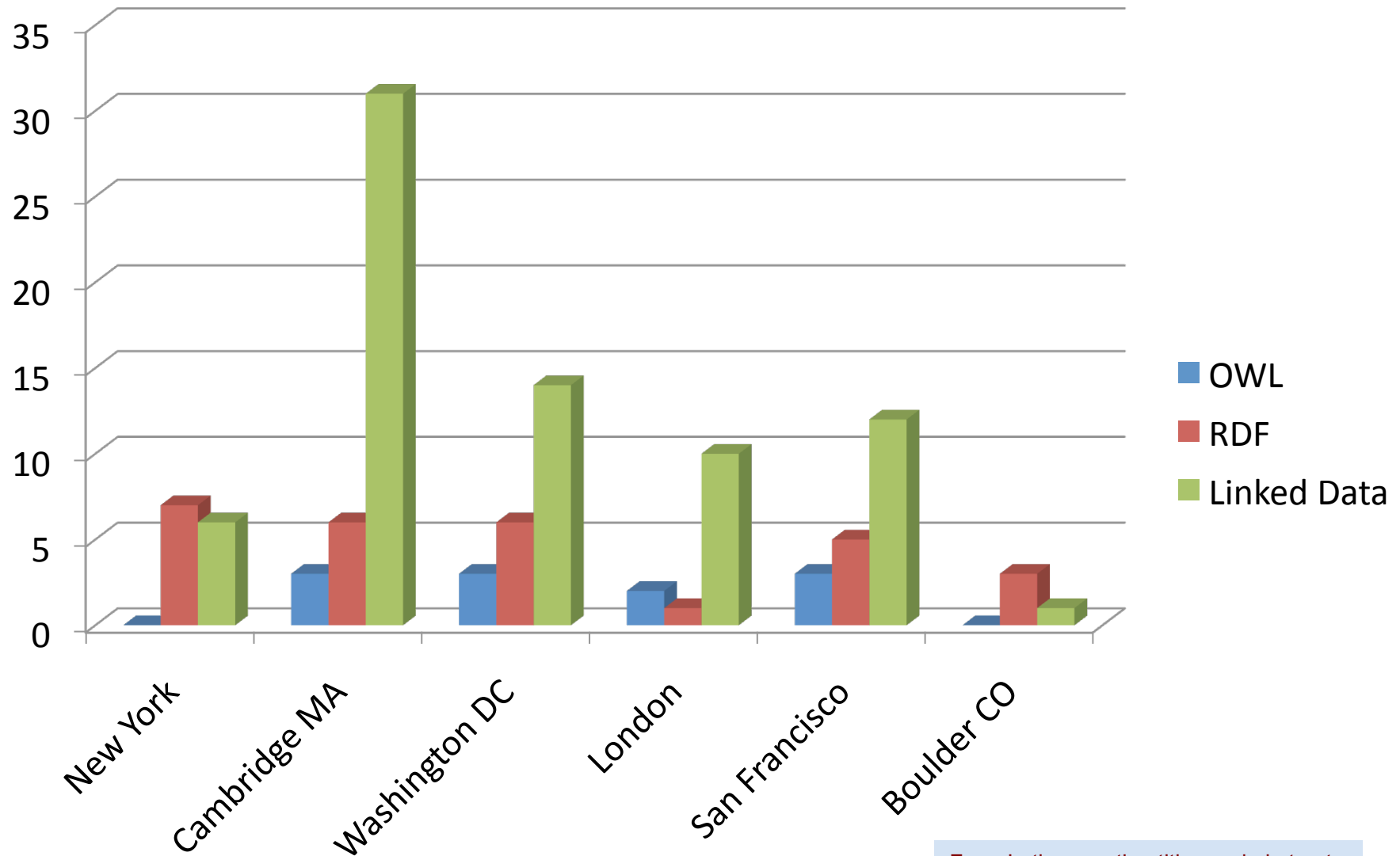


figure made with TopBraid Composer™



Lotico Topics of Interest



From Lotico meeting titles and abstracts

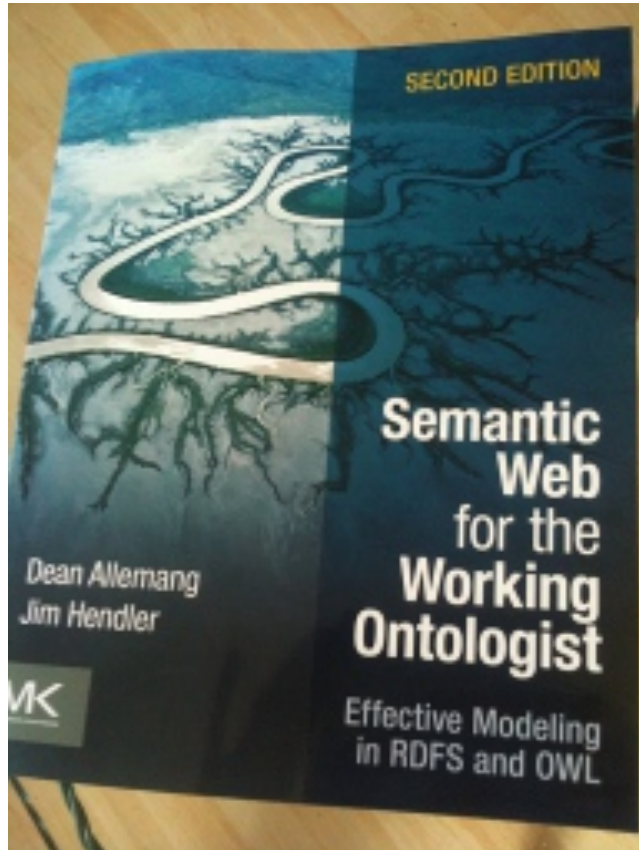


Demystification of OWL

- ❑ You may be surprised by what other people don't know – and whether they are motivated to learn it!
- ❑ One of the most successful OWL deployments is one where end deployers don't need to know OWL – It can be done!



Read more



- ❑ Semantic Web for the Working Ontologist by Dean Allemang and Jim Hendler

- ❑ Second Edition available now!

- ❑ Features
 - Good Relations
 - QUDT
 - Lots more!