



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 screenshot shows a Windows Internet Explorer browser window displaying the website <http://workingontologist.org/>. The website features a navigation bar with links to **HOME**, [examples](#), and [errata](#). A large image of the book cover for **SEMANTIC WEB for the WORKING ONTOLOGIST** by Dean Allemang and Jim Hendler is prominent. The book cover text includes "Effective Modeling in RDFS and OWL". Below the book image, a text box describes the book as cutting through the hype around the Semantic Web, providing a simple, feasible, coherent story of a technology that provides real business value today. It mentions authors Allemang and Hendler and describes how the Semantic Web builds on the same principles that powered the success of Wikipedia. A "Like" button and "52 likes" are visible. A "Buy it now" link is also present. A "News" section mentions a 2011 March update. The browser's address bar shows the URL, and the search bar shows "Yahoo! Search".

Below the website screenshot, the Facebook page for "Semantic Web for the Working Ontologist" is shown. The page has a blue header with the Facebook logo and navigation links. The main content area includes an "Administer Your Page" section, a "Wall" section with a "What's on your mind?" prompt, and a "You and Semantic Web for the Working Ontologist" section. The "You and Semantic Web for the Working Ontologist" section features a photo of the book cover and text about the second edition being out, with advance copies available and new chapters on SPARQL and SKOS. A blue circle highlights the book cover and title on the website, and a blue arrow points from it to the Facebook page's "You and Semantic Web for the Working Ontologist" section. The Facebook page also shows a sidebar with "Admins (1)", "Notifications", "Promote with an Ad", "View Insights", "Suggest to Friends", and "You and Semantic Web for the Working Ontologist" with a "Chat (35)" button.

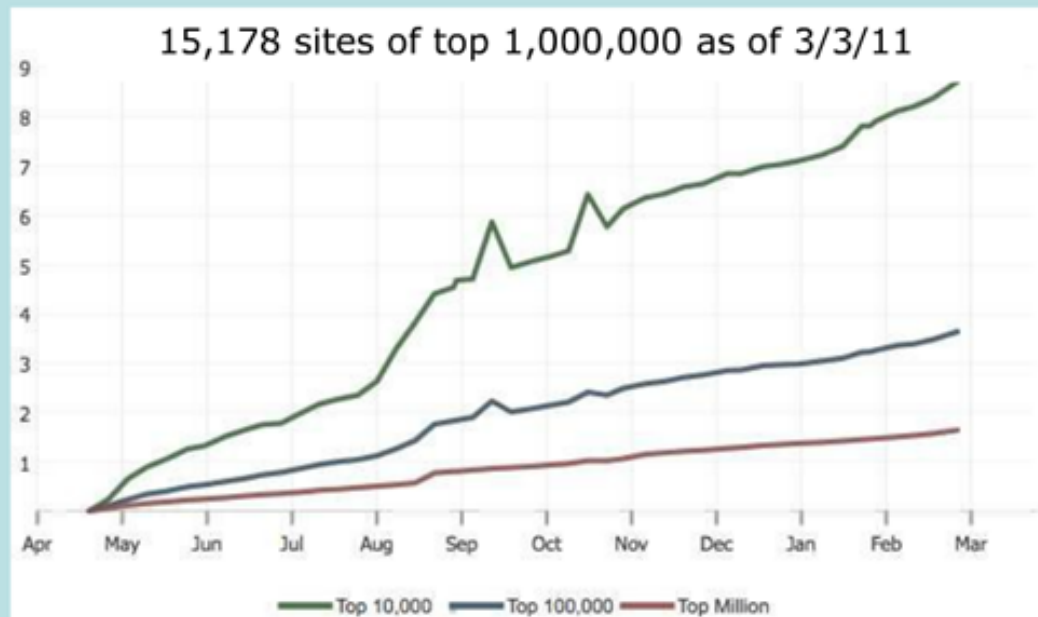


Facebook and OGP



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 ?

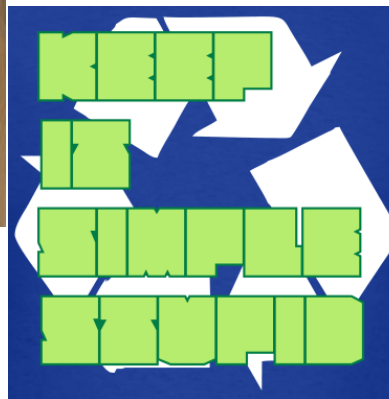
<meta property="og:description" content="A group of U.S. Marines, under command of a renegade general, take over Alcatraz and threaten San Francisco Bay with biological weapons."/>



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.



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

Go 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.
```

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Namespaces used in Overstock.com product pages

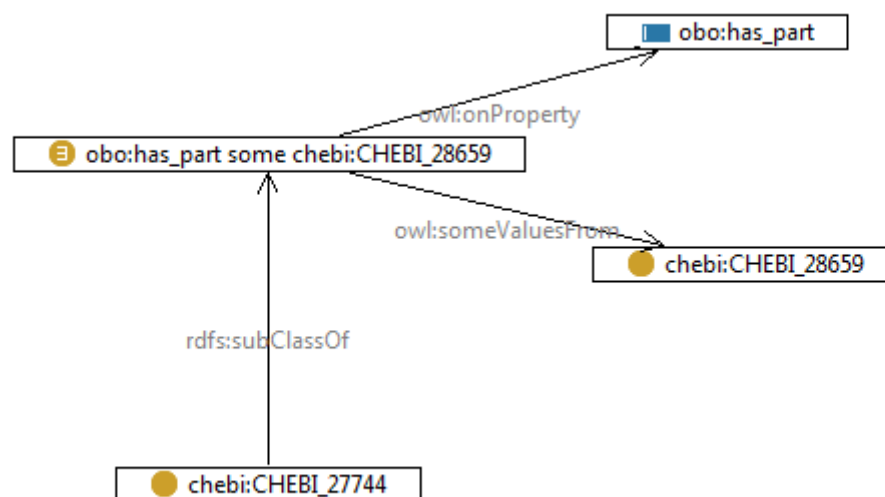
- ❑ The actual overstock.com product pages include commerce data about their products. This data uses:
 - OGP (image etc.)
 - GR (Good Relations)
 - FOAF (depiction)
 - RDFS (comment and label)
 - RDF review vocabulary (<http://vocab.org/review/terms.html>)
 - RDF data vocabulary (<http://rdf.data-vocabulary.org/>)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

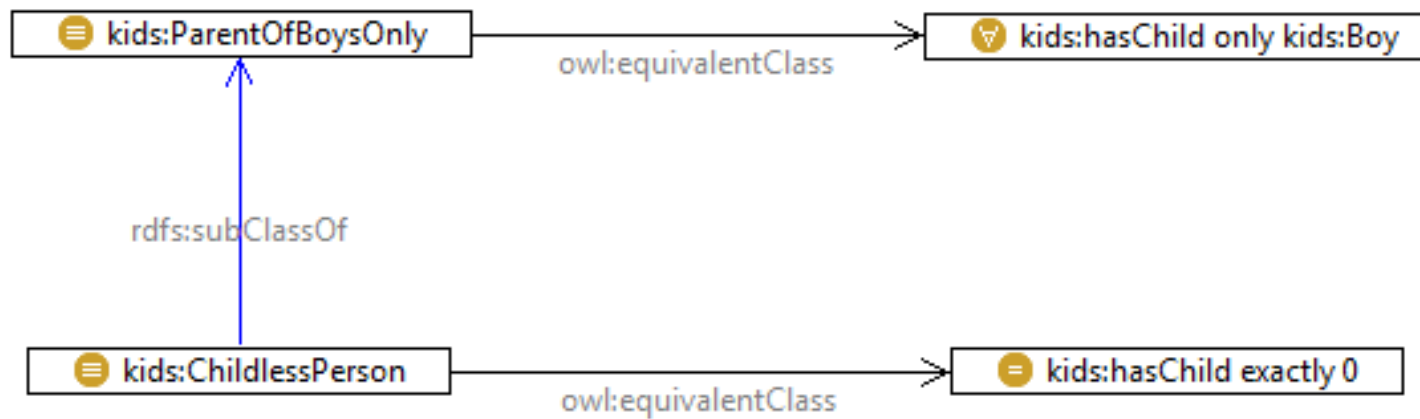
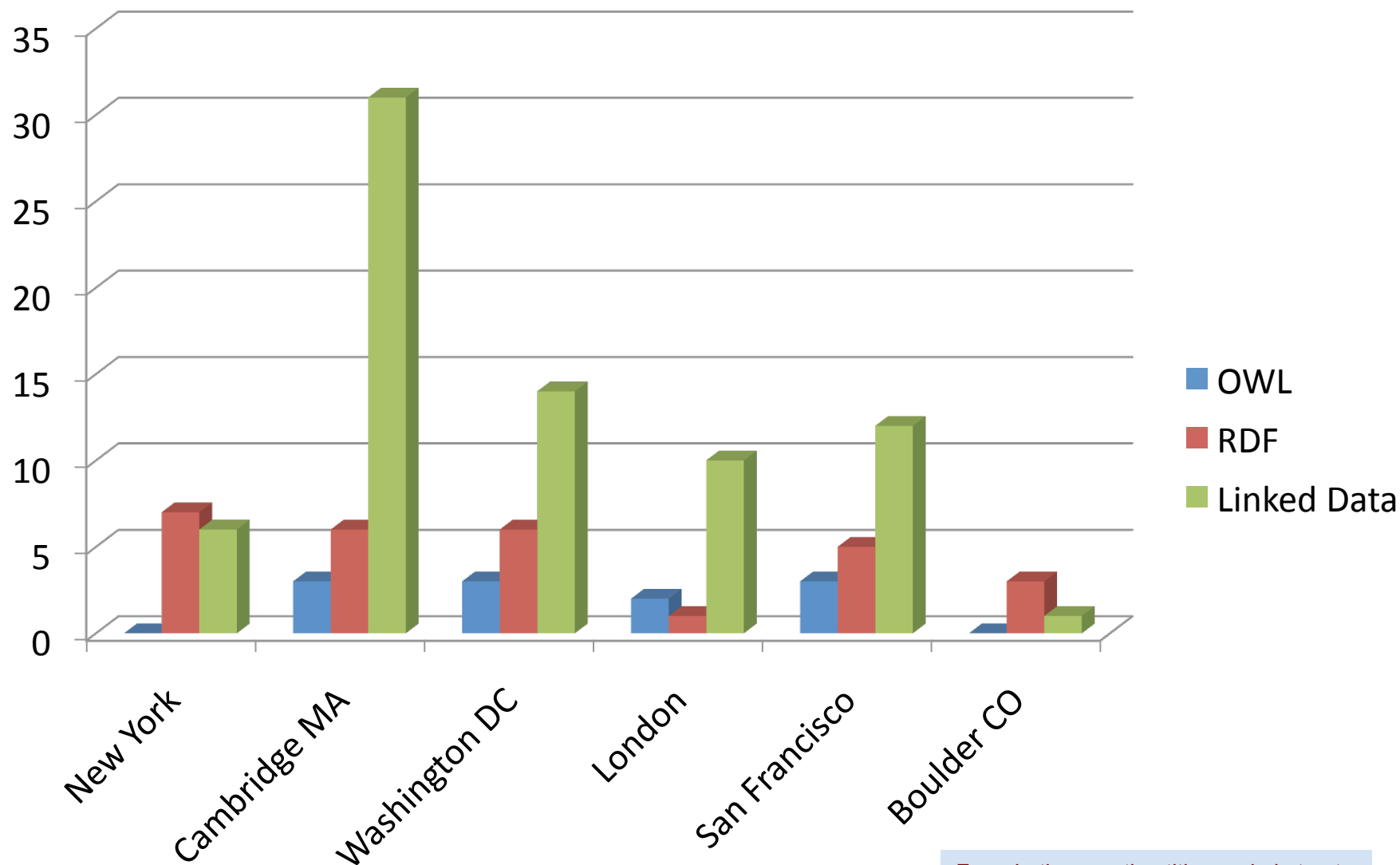


figure made with TopBraid Composer™

Lotico Topics of Interest



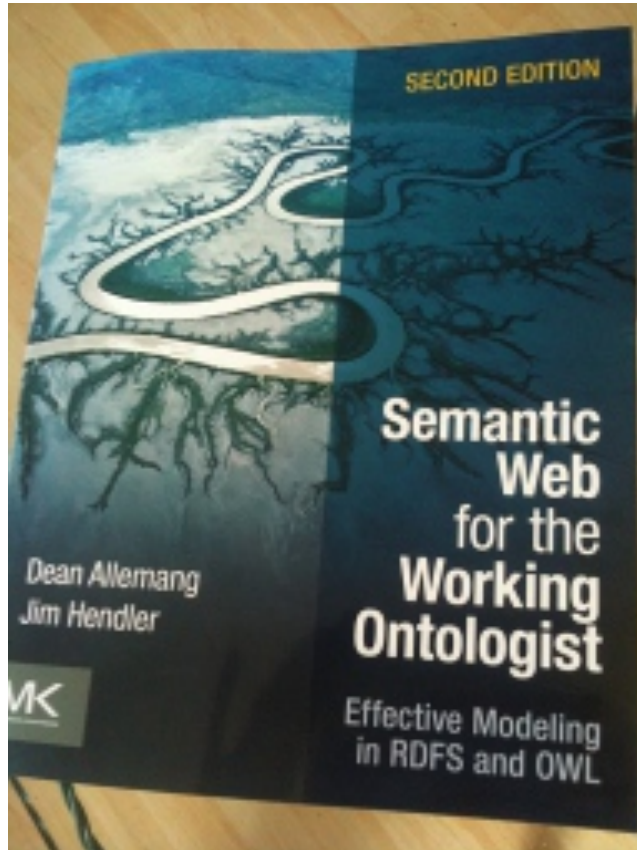
From Lotico meeting titles and abstracts



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!