

RDFa: Embedding RDF Knowledge in HTML

Some content from a presentation by Ivan Herman of the W3C, [Introduction to RDFa](#), given at the 2011 Semantic Technologies Conference.

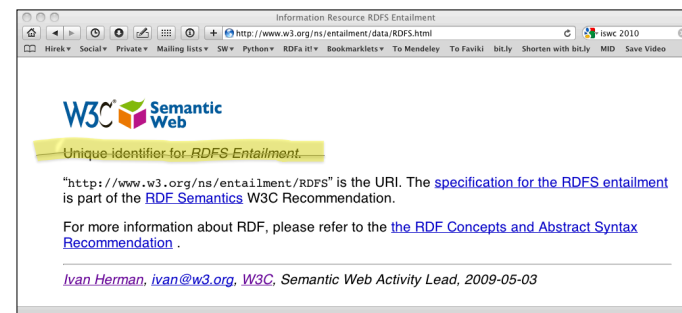
What is RDFa?

- Simple idea: RDFa is a serialization of RDF embedded in XHTML, HTML or XML
 - Provides a set of attributes (the *a* in RDFa) to use with existing tags to carry the RDF metadata
- 2004: work on developing standards began
- 2008: RDFa 1.0 a recommendation
 - Worked only in [XHTML](#), which did not catch on
- 2012: RDFa 1.1 a recommendation
 - Works in [HTML4](#), [HTML5](#) and XHTML
- See <http://rdfa.info/>

Principles of RDFa

- RDF content specified in XML *attributes* rather than *elements*
 - The XML/HTML *tree structure* is used as context, when appropriate
 - Some new attributes are *introduced* and some existing ones (`@href`, `@rel`) *reused*
 - When possible, HTML text content is used for *literal values*
- Same file used by browser & RDF extractor

A Web page viewed by a person



<http://www.w3.org/ns/entailment/data/RDFS.html>

The source

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

Source and generated RDF...

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

```
<http://www.w3.org/ns/entailment/RDFS>  
...
```

Source and generated RDF...

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

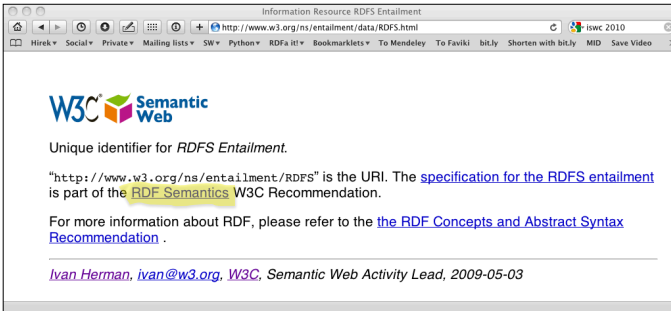
```
<http://www.w3.org/ns/entailment/RDFS>  
<http://purl.org/dc/terms/description>  
...
```

Source and generated RDF...

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

```
<http://www.w3.org/ns/entailment/RDFS>  
<http://purl.org/dc/terms/description>  
  "Unique identifier for RDFS Entailment." .
```

The Web page viewed by a person



The source

```
<a about="http://www.w3.org/ns/entailment/RDFS"
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">
  RDF Semantics.
</a>
```

Source and generated RDF...

```
<a about="http://www.w3.org/ns/entailment/RDFS"
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">
  RDF Semantics.
</a>
```

```
<http://www.w3.org/ns/entailment/RDFS>
...
```

Source and generated RDF...

```
<a about="http://www.w3.org/ns/entailment/RDFS"
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">
  RDF Semantics.
</a>
```

```
<http://www.w3.org/ns/entailment/RDFS>
<http://www.w3.org/2000/01/rdf-schema#seeAlso>
...
```

Source and generated RDF...

```
<a about="http://www.w3.org/ns/entailment/RDFS"
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">
  RDF Semantics.
</a>
```

```
<http://www.w3.org/ns/entailment/RDFS>
  <http://www.w3.org/2000/01/rdf-schema#seeAlso>
    <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> .
```

We have Ntriples in HTML

- Maybe we can do better, instead of this

```
<http://www.w3.org/ns/entailment/RDFS>
  <http://purl.org/dc/terms/description>
    "Unique identifier for RDFS Entailment." .
<http://www.w3.org/ns/entailment/RDFS>
  <http://www.w3.org/2000/01/rdf-schema#seeAlso>
    <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> .
```

- Allow URI prefixes and shared subject, like

```
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix dcterms: <http://purl.org/dc/terms/> .

<http://www.w3.org/ns/entailment/RDFS>
  rdfs:seeAlso <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> ;
  dcterms:description "Unique identifier for RDFS Entailment." .
```

Turtlizing RDFa

- Turtle supports several simplifying ideas
- Use compact URIs when possible
 - A [CURIE](#) or compact URI, typically a URI with a prefix defined elsewhere, e.g., *foaf:mbob*
- Making use of the natural structure for
 - shared subjects
 - shared predicates
 - creating blank nodes
 - ...

CURIE definition and usage

```
<html>
...
<p about="http://www.w3.org/ns/entailment/RDFS"
  property="http://purl.org/dc/terms/description">
  Unique identifier for <em>RDFS Entailment</em>.</p>
...
</html>
```

- can be replaced by:

```
<html prefix="dcterms: http://purl.org/dc/terms/">
...
<p about="http://www.w3.org/ns/entailment/RDFS"
  property="dcterms:description">
  Unique identifier for <em>RDFS Entailment</em>.</p>
...
</html>
```

Details on @prefix in RDFa

- Can be anywhere in the tree and is valid for the whole sub-tree
 - i.e., the html element is not the only place to have it
- The same @prefix attribute can hold several definitions:
 - prefix="dcterm: http://purl.org... foaf: http://..."
- CURIEs and “real” URIs can usually be mixed
- CURIEs *cannot* be used on @href

Sharing subjects

The basic principle: @about is inherited by children nodes, so there's no reason to repeat it

```
<html prefix="dcterms: http://purl.org/dc/terms/
        rdfs: http://www.w3.org/2000/01/rdf-schema#">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="dcterms:description">
  Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
  RDFS Semantics</a>...</p>
```

... yielding

```
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix dcterms: <http://purl.org/dc/terms/> .

<http://www.w3.org/ns/entailment/RDFS>
  rdfs:seeAlso <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> ;
  dcterms:description "Unique identifier for RDFS Entailment." .
```

On reusing literals

- Reusing literals is a plus, but you don't always want to do it
- The basic rule says: the (RDF) Literal is the enclosed text from the HTML content
- This is fine in 80% of the cases, but...
- ...it may not be natural in many cases!

Example: dates

```
<body about=".." prefix="dcterms: http://... xsd: http://..."
  <address>
    <p property="dcterms:date" datatype="xsd:date">2010-07-05</p>
  </address>
</body>
```

- This leads to:

```
@prefix dcterms: <http://...> .
@prefix xsd: <http://...> .
<..> dcterms:date "2010-07-05"^^xsd:date .
```

- 2010-07-05 is the official ISO format (for xsd:date) but "July 5, 2010" is preferred by people

Usage of @content

```
<body about=".." prefix="dcterms: http://... xsd: http://..."
  <address>
    <p property="dcterms:date" datatype="xsd:date"
      content="2010-07-05">July 5, 2010</p>
  </address>
</body>
```

- Also leads to:

```
@prefix dcterms: <http://...> .
@prefix xsd: <http://...> .
<..> dcterms:date "2010-07-05"^^xsd:date .
```

On subjects and objects

- Here is our rule so far
 - @about sets the subject
 - @href sets the object
- But that is not always good enough
 - We may not want to introduce an active link (i.e., "a" element) on the web page
 - what about other links in HTML?

We may not always want links...

- The RDFa @resource attribute is equivalent to @href
- Sets the object, just like @href but is ignored by browsers, e.g.,:

```
<span about="http://www.ivan-herman.net/foaf#me">
  <span rel="rdfs:seeAlso"
    resource="http://www.w3.org/People/Ivan/">Activity Lead</span>
</span>
```

More features

- RDFa1.1 has more features that make it easier to represent knowledge compactly in HTML
- These take advantage of the HTML tree context
- See the hidden slides if you are interested

Chaining

- Here is what we would like to have in RDFa

```
<http://www.w3.org/ns/entailment/RDFS>
  dcterms:creator <http://www.ivan-herman.net/foaf#me> .

<http://www.ivan-herman.net/foaf#me>
  foaf:mailbox <mailto:ivan@w3.org> ;
  foaf:workplaceHomepage <http://www.w3.org> .
```

Chaining

- A straightforward way:

```
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<address>
  <span rel="dcterms:creator"
    resource="http://www.ivan-herman.net/foaf#me"/>
  <span about="http://www.ivan-herman.net/foaf#me">
    <a rel="foaf:mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </span>
</address>
```

Chaining

- A straightforward way:

```
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<address>
  <span rel="dcterms:creator"
    resource="http://www.ivan-herman.net/foaf#me"/>
  <span about="http://www.ivan-herman.net/foaf#me">
    <a rel="foaf:mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </span>
</address>
```

Chaining: when objects become subjects

- An alternative:

```
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<address>
  <span rel="dcterms:creator"
        resource="http://www.ivan-herman.net/foaf#me">
    <a rel="foaf:mailbox"
        href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
        href="http://www.w3.org">W3C</a>
  </span>
</address>
```

Chaining means

- @resource (or @href) becomes a subject *for the sub-tree*
- This feature is a bit like in RDF/XML

Some extra features

- Blank nodes can be created using “_:XX”
- Shorthand for RDF types
- Helping single-vocabulary cases
- Profiles

Typing

- Typing can of course be done using @rel="rdf:type"
- But that is a widely used combination, so there is a separate @typeof attribute for that

Typing example

```
<span about="http://www.ivan-herman.net/foaf#me"
  typeof="foaf:Person">
  <span property="foaf:name">Ivan Herman</span>
</span>
```

- yields

```
<http://www.ivan-herman.net/foaf#me> a foaf:Person ;
  foaf:name "Ivan Herman" .
```

Single-vocabulary case

- In many cases the content is dominated by one vocabulary, e.g., dcterms, foaf, etc.
- CURIEs and URIs use is intuitive for RDF people but *not* for average HTML authors!
- Solution:
 - define a vocabulary URI for a sub-tree
 - for that sub-tree, simple *terms* in @rel, @property, etc., are automatically expanded into a full URI using the vocabulary

@vocab and terms: this...

```
<div prefix="foaf: http://xmlns.com/foaf/0.1/">
...
  <address about="http://www.ivan-herman.net/foaf#me"
    typeof="foaf:Person">
    <span property="foaf:name">Ivan Herman</span>,
    <a rel="foaf:mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </address>
```

...becomes

```
<div vocab="http://xmlns.com/foaf/0.1/">
...
  <address about="http://www.ivan-herman.net/foaf#me"
    typeof="Person">
    <span property="name">Ivan Herman</span>,
    <a rel="mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </address>
```

...becomes

```
<div vocab="http://xmlns.com/foaf/0.1/">
...
<address about="http://www.ivan-herman.net/foaf#me"
  typeof="Person">
  <span property="name">Ivan Herman</span>,
  <a rel="mailbox"
    href="mailto:ivan@w3.org">ivan@w3.org</a>,
  <a rel="workplaceHomepage"
    href="http://www.w3.org">W3C</a>
</address>
```

...becomes

```
<div vocab="http://xmlns.com/foaf/0.1/">
...
<address about="http://www.ivan-herman.net/foaf#me"
  typeof="Person">
  <span property="name">Ivan Herman</span>,
  <a rel="mailbox"
    href="mailto:ivan@w3.org">ivan@w3.org</a>,
  <a rel="workplaceHomepage"
    href="http://www.w3.org">W3C</a>
</address>
```

Profile files

- Prefix and term declarations can be collected in a separate file and referred to via a @profile attribute pointing to the file
- Say, file "http://ex.org/prof" defines
 - prefix mappings:
 - "foaf" → "http://xmlns.com/foaf/0.1/"
 - "rdfs" → <http://www.w3.org/2000/01/rdf-schema#>
 - term mapping:
 - "desc" → <http://purl.org/dc/terms/description>

Profile usage example: this...

```
<html prefix="dcterms: http://purl.org/dc/terms/
  rdfs: http://www.w3.org/2000/01/rdf-schema#">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
  <p property="dcterms:description">
    Unique identifier for <em>RDFS Entailment</em>.</p>
  <p>...<a rel="rdfs:seeAlso"
    href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
    RDFS Semantics</a>...</p>
...
  <address about="http://www.ivan-herman.net/foaf#me">
    <span property="foaf:name">Ivan Herman</span>,
    ...
```

...becomes

```
<html profile="http://ex.org/prof">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="desc">
  Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
  RDFS Semantics</a>...</p>
...
<address about="http://www.ivan-herman.net/foaf#me">
  <span property="foaf:name">Ivan Herman</span>,
  ...
```

...becomes

```
<html profile="http://ex.org/prof">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="desc">
  Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
  RDFS Semantics</a>...</p>
...
<address about="http://www.ivan-herman.net/foaf#me">
  <span property="foaf:name">Ivan Herman</span>,
  ...
```

Default profiles

- Even usage of profiles might be “too much” for many HTML authors 😊
 - authors will forget to add the @profile declaration
- RDFa defines *default profiles*:
 - RDFa clients include these profiles automatically

Default profiles

- Default for RDFa in general
 - <http://www.w3.org/profile/rdfa-1.1>
 - includes some widely used prefixes (rdf, rdfs, vcard, og, foaf, dc, or dcterms are typical candidates)
 - the profile is to be updated regularly by *adding* new prefixes
- Default for (X)HTML
 - <http://www.w3.org/profile/html-rdfa-1.1>
 - includes the HTML4 @rel values (next, up, license, ...)
 - the profile is to be updated regularly by *adding* @rel values as they evolve in the HTML world

So this...

```
<html profile="http://ex.org/prof">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="dcterms:description">
Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
RDFS Semantics</a>...</p>
```


...becomes:

```
<html>
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="dcterms:description">
Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
RDFS Semantics</a>...</p>
```

Authoring RDFa

- Some authoring tools already have RDFa facilities:
 - e.g., it is possible to add the right DTD to Dreamweaver, Amaya has it at its core, etc.
- There are plugins to, e.g., WordPress, to generate RDFa markup
- CMS systems (like Drupal 7) may have RDFa built in their publication system
 - users generate RDFa whether they know about it or not...

Consuming RDFa

- Various search engines are consuming RDFa
 - Google, Yahoo, ...
 - they may specify which vocabularies they “understand”
 - this is still an evolving area
- There are libraries, distillers, etc., to extract RDFa information
 - may be part of RDF development environments like Redland, RDFLib
 - see, for further references, <http://rdfa.info/wiki/Consume>
- Facebook’s “social graph” is based on RDFa 

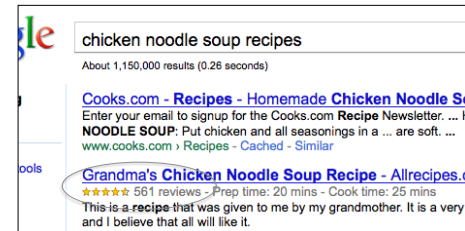
Publishing RDFa

- RDFa+HTML file can just be on a server
 - the client extracts the RDF content
- Content negotiations can be set up on the server side
 - the client gets the format he/she asks for
 - the RDF content can either be generated on the fly or stored on the server statically

Google's rich snippets

Embedded metadata (microdata or RDFa) is used to improve search result page

- at the moment only a few vocabularies are recognized, but that will evolve over the years

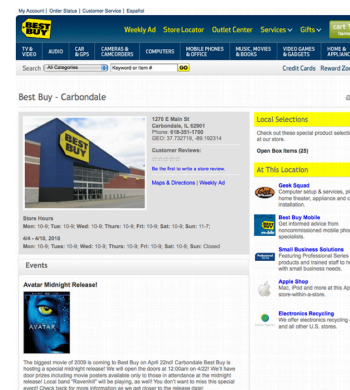


Effects of, e.g., Google of Facebook

A number of popular sites publish RDFa as part of their normal pages:

- Tesco, BestBuy, Slideshare, The London Gazette, Newsweek, MSNBC, O'Reilly Catalog, the White House...
- Creative Commons snippets are in RDFa (e.g., on Flickr)

BestBuy example of RDFa use



Courtesy of Jay Myers, BestBuy, SemTech2010 Presentation

BestBuy example of RDFa Use

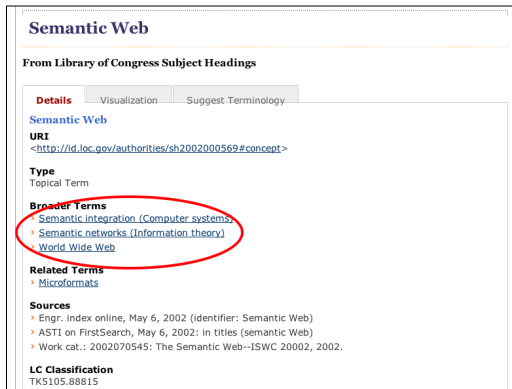


Courtesy of Jay Myers, BestBuy, SemTech2010 Presentation

Effects on BestBuy

- Reported in a BestBuy blog:
 - GoodRelations+RDFa improved Google rank tremendously
 - 30% increase in traffic on BestBuy store pages
 - Yahoo observers a 15% increase in click-through rate
- Today, BestBuy uses RDFa for much more than just snippets
 - E.g., to locate shops that have certain products on stock...

Library of Congress RDFa use



Library of Congress RDFa use



Overstock.com example

Shopping Community Cars Real Estate Auctions We Recommend My Account

overstock.com 11 Years Free Shipping on your orders

Shop All Departments

Online Shopping Electronics Cameras & Photo Camcorders Digital Camcorders

PHOTOS

Bell and Howell DV550UW 12MP Digital Video Camera with Underwater Housing

Rating 3.8 ★★★★★ 10 reviews

Get 5% back with Club O

View Details

Today: \$68.99

Sold out!
This product is not in stock. We will notify you when this product is in stock. Please enter your email address below, then

Item#: 12403958

Brief Description

- Take great videos with the Bell + Howell digital video camera
- Digital video camera has ultra compact body and features a flip-up USB
- Camcorder includes waterproof underwater housing to take video underwater (up to 33 ft)

SVP Underwater SMP Digital Video Camera

Today: \$75.99

Overstock.com example

Shopping Community Cars Real Estate Auctions We Recommend My Account

overstock.com 11 Years Free Shipping on your orders

Shop All Departments

Online Shopping Electronics Cameras & Photo Camcorders Digital Camcorders

PHOTOS

Bell and Howell DV550UW 12MP Digital Video Camera with Underwater Housing

Rating 3.8 ★★★★★ 10 reviews

Get 5% back with Club O

View Details

Today: \$68.99

Sold out!
This product is not in stock. We will notify you when this product is in stock. Please enter your email address below, then

Item#: 12403958

Brief Description

- Take great videos with the Bell + Howell digital video camera
- Digital video camera has ultra compact body and features a flip-up USB
- Camcorder includes waterproof underwater housing to take video underwater (up to 33 ft)

SVP Underwater SMP Digital Video Camera

Today: \$75.99

Drupal content management system

Drupal

Want to see the latest Drupal news? Sign up for our newsletter.

Why Choose Drupal?

Drupal 7 is the latest and greatest version of Drupal. It's faster, more secure, and more powerful than ever before.

529,432 people in 228 countries speaking 182 languages power Drupal.

- RDF support in Drupal v. 7
- Major CMS system
- Has RDF at his core, pages contain RDFa
- In one step millions of pages of additional RDF data!

The Examiner.com

examiner.com National the insider source for local CHANGE CITY

Google Custom Search

HOME ENTERTAINMENT SPORT & RECREATION FAMILY & HOME LIFESTYLE HEALTH & BEAUTY NEWS & INFO

Log In

Sheriff Dupnik names Angle and Pain as two responsible for 'vitriol' (Video)

Yesterday Pima County Sheriff Charles Dupnik took the bold step of naming Sharon Angle and Sarah Palin as two individuals responsible for the kind of toxic 'vitriol' which he believes must end in light of the recent shooting in Tucson, Arizona. Dupnik's comments came in an interview with Geraldo Rivera of Fox News. Earlier in the day Dupnik had been interviewed by Megan Kelly of Fox News, who accused the Sheriff of inserting politics where it did not belong. In the Rivera interview, Dupnik stands by his earlier comments, and goes further in identifying two Republicans as the source...

Ryan Witt
Local Buzz Examiner
Receive these Politics articles

Sheriff Dupnik names Angle and Pain as two responsible.

Missed field goals by Eagles' Vick could make them...

FDA outlawing natural cancer care to further destroy...

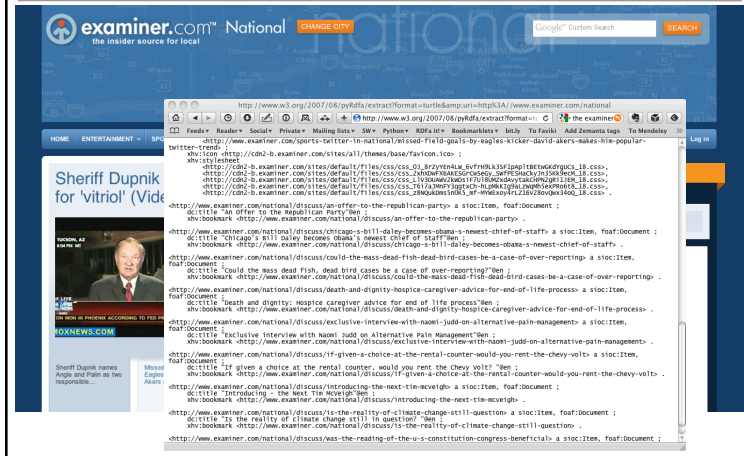
Eco-Travel Tip: Use an eBook reader to lighten your...

Lyndon Johnson and the Great Society...

WRITE FOR US!

SLIDESHOW SLIDESHOW

The Examiner.com



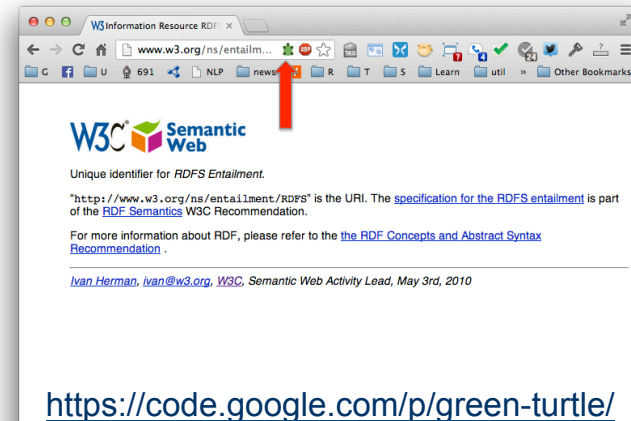
Extracting the data

```
rdfa> python getdata.py "http://www.w3.org/ns/entailment/data/RDFS.html"
@prefix dc: <http://purl.org/dc/terms/> .
@prefix ent: <http://www.w3.org/ns/entailment/> .
...
ent:rDFS a ent:Entailment ;
dc:creator <http://www.ivan-herman.net/foaf#me> ;
dc:date "2010-05-03"^^xsd:date ;
dc:description "Unique identifier for RDFS Entailment" ;
rdfs:comment "The specification for the RDFS entailment is ... Semantics W3C Recommendation." ;
rdfs:isDefinedBy <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/#rdfs_entailment> ;
rdfs:seeAlso <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> .
<http://www.w3.org/ns/entailment/data/RDFS.html> dc:title "Information Resource RDFS Entailment" ;
xhv:stylesheet <http://www.w3.org/StyleSheets/TR/base> .
<http://www.ivan-herman.net/foaf#me> a foaf:Person ;
rdfs:seeAlso <http://www.ivan-herman.net/foaf/> ;
foaf:mbox <mailto:ivan@w3.org> ;
foaf:name "Ivan Herman" ;
foaf:title "Semantic Web Activity Lead" ;
foaf:workplaceHomepage <http://www.w3.org> .
```

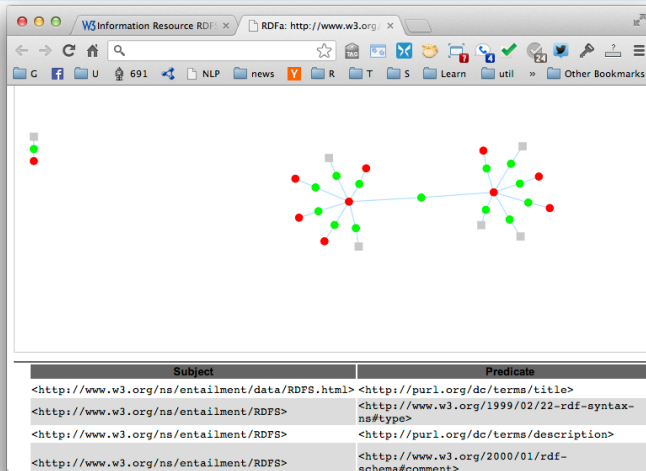
getdata.py is very simple

```
import rdflib, sys
nargs = len(sys.argv)
if not (1 < nargs < 4):
    print 'usage: python getdata.py url [ rdfa | rdfa.1 | microdata | html ]'
    print ' eg: python getdata.py "http://www.w3.org/ns/entailment/data/RDFS.html"'
    sys.exit(0)
url = sys.argv[1]
format = sys.argv[2] if nargs == 3 else 'rdfa.1'
g = rdflib.Graph()
g.parse(url, format=format)
print g.serialize(format='n3')
```

Greenturtle Chrome plugin



Greenturtle Chrome plugin



The screenshot shows the Greenturtle Chrome plugin interface. The top part displays a network graph with nodes and edges. The bottom part shows a table of RDF triples.

Subject	Predicate
<code><http://www.w3.org/ns/entailment/data/RDFS.html></code>	<code><http://purl.org/dc/terms/title></code>
<code><http://www.w3.org/ns/entailment/RDFS></code>	<code><http://www.w3.org/1999/02/22-rdf-syntax-ns#type></code>
<code><http://www.w3.org/ns/entailment/RDFS></code>	<code><http://purl.org/dc/terms/description></code>
<code><http://www.w3.org/ns/entailment/RDFS></code>	<code><http://www.w3.org/2000/01/rdf-schema#comment></code>

Conclusions

- Web developers want content providers to add structured data to HTML pages
- Content providers are incentivised to do so because their content will be better understood, ranked higher, more useful, etc.
- RDFa is the most powerful and flexible of the knowledge mark up standards understood by search engines
- RDFa is also an alternative serialization of full RDF