



# World Wide Web Consortium Semantic Web and Opportunities for the Oil and Gas Industry

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This talk:

<http://www.w3.org/2008/Talks/0130-bratt-W3C-Energy/W3C-SemWeb-Appsp.pdf>

# Outline

- World Wide Web Consortium
  - Mission, organization
  - Summary of technologies
- Semantic Web
  - One slide tutorial
  - Market trends
- Semantic Web Applications
  - Rapid rise in work in the field
  - W3C's Health Care / Life Sciences initiative
- Opportunities for the Oil and Gas Industry
  - How to move forward
  - Discussion

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# World Wide Web Consortium

- Mission, organization
- Summary of technologies

# The Leading Web Standards Organization

- W3C engineers the Web's foundation

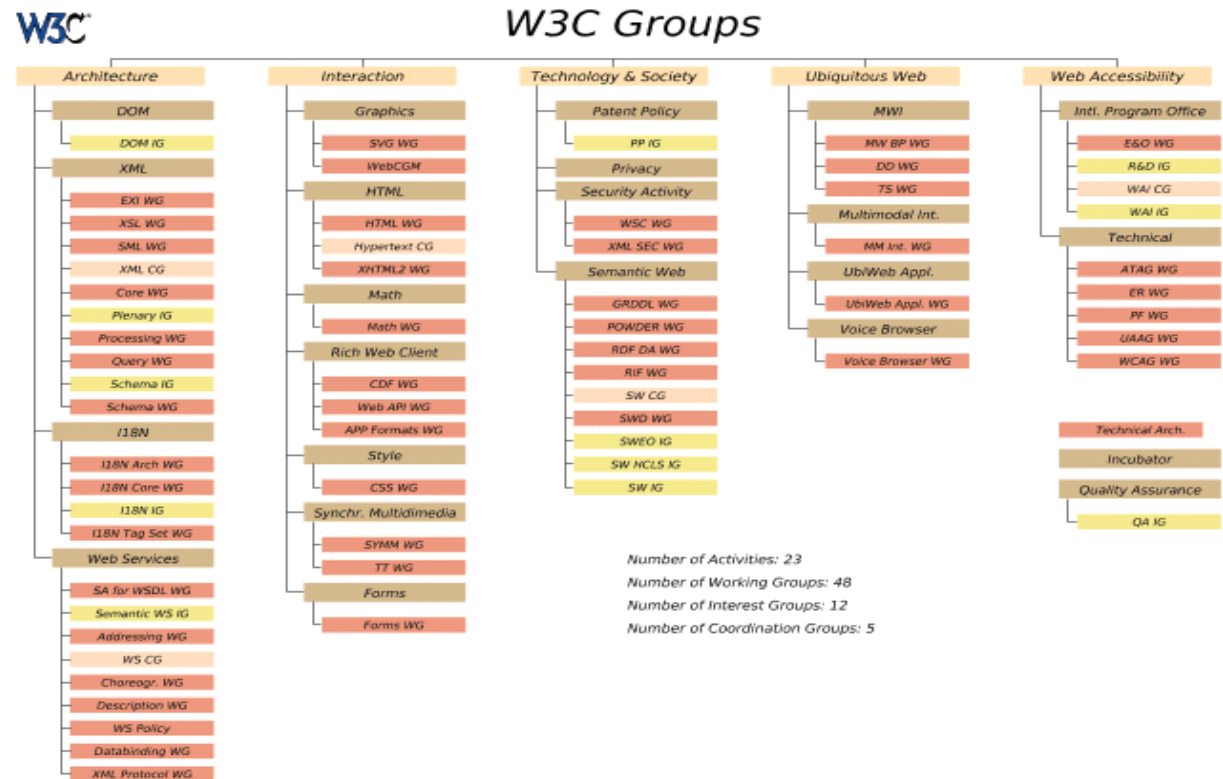
- 1000+ technologists in 60 groups
- (x)HTML, XML, CSS, VoiceXML, Mobility, Ubiquity, Video, Web Services, Web 2.0, Semantic Web, Security, Accessibility, Privacy, I18N,

Architecture

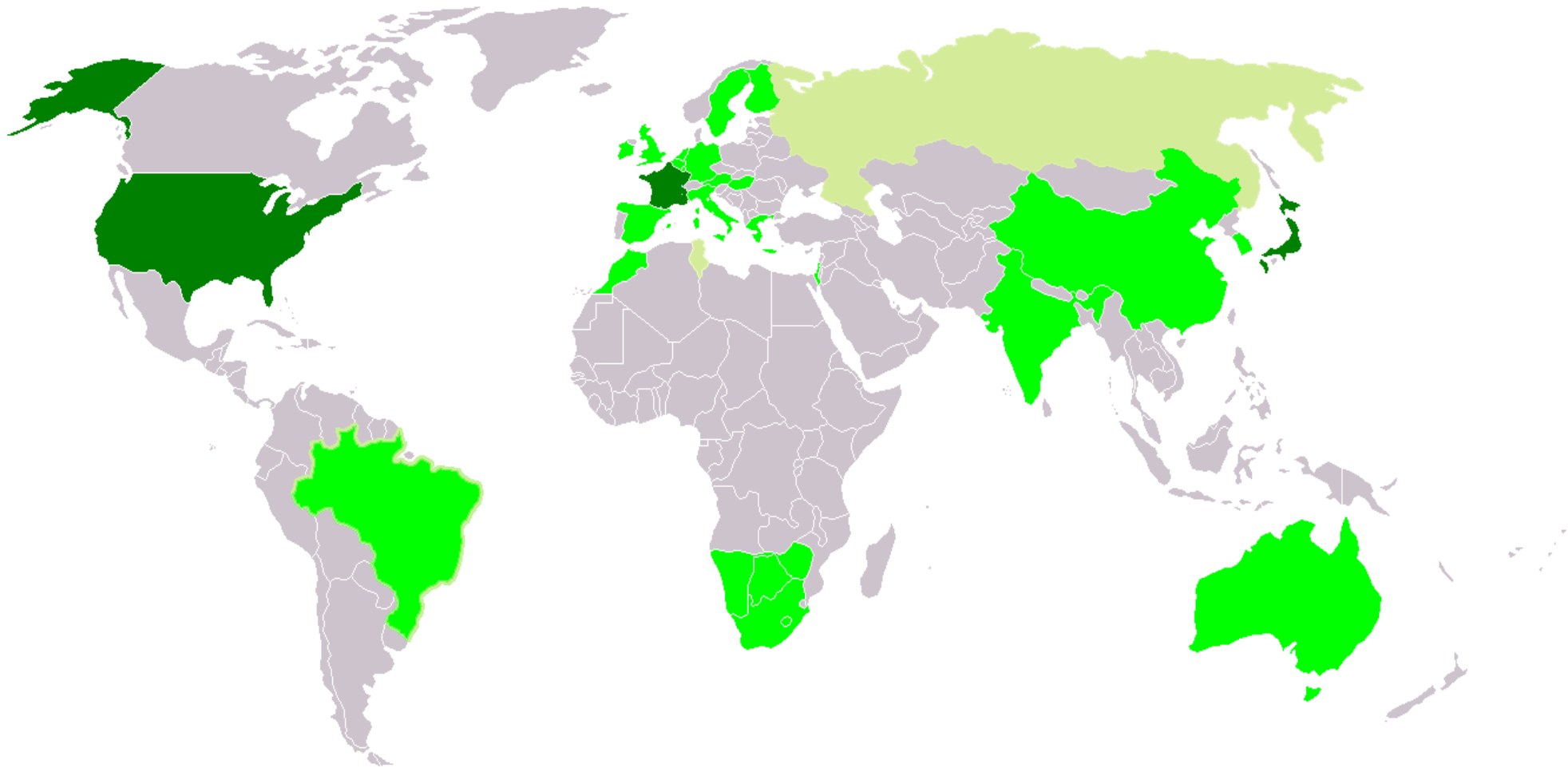
- 430 Members

- 60 Technical Staff

- 40+ Liaisons



# Offices in 21 Countries (more under consideration)



# Semantic Web

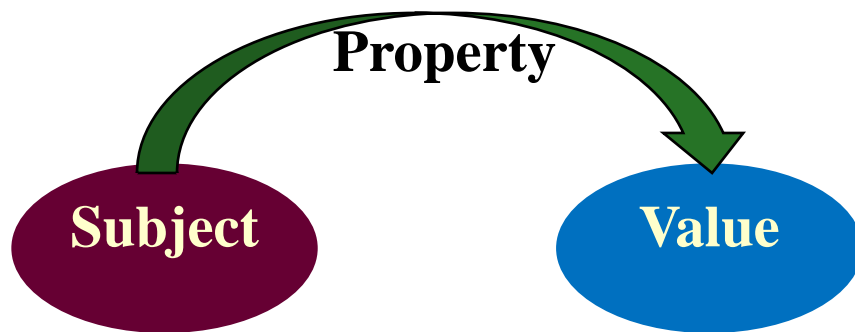
- One-slide tutorial
- Market trends
- Applications

## Semantic Web Introduction, Tutorial, Applications

- › <http://www.w3.org/People/Ivan/CorePresentations/>
- › ... Compiled by Ivan Herman, W3C Semantic Web Activity Lead

# Semantic Web @ W3C

- Web 1.0 = Linked Documents
- Semantic Web = Linked Data (Web 3.0\*)

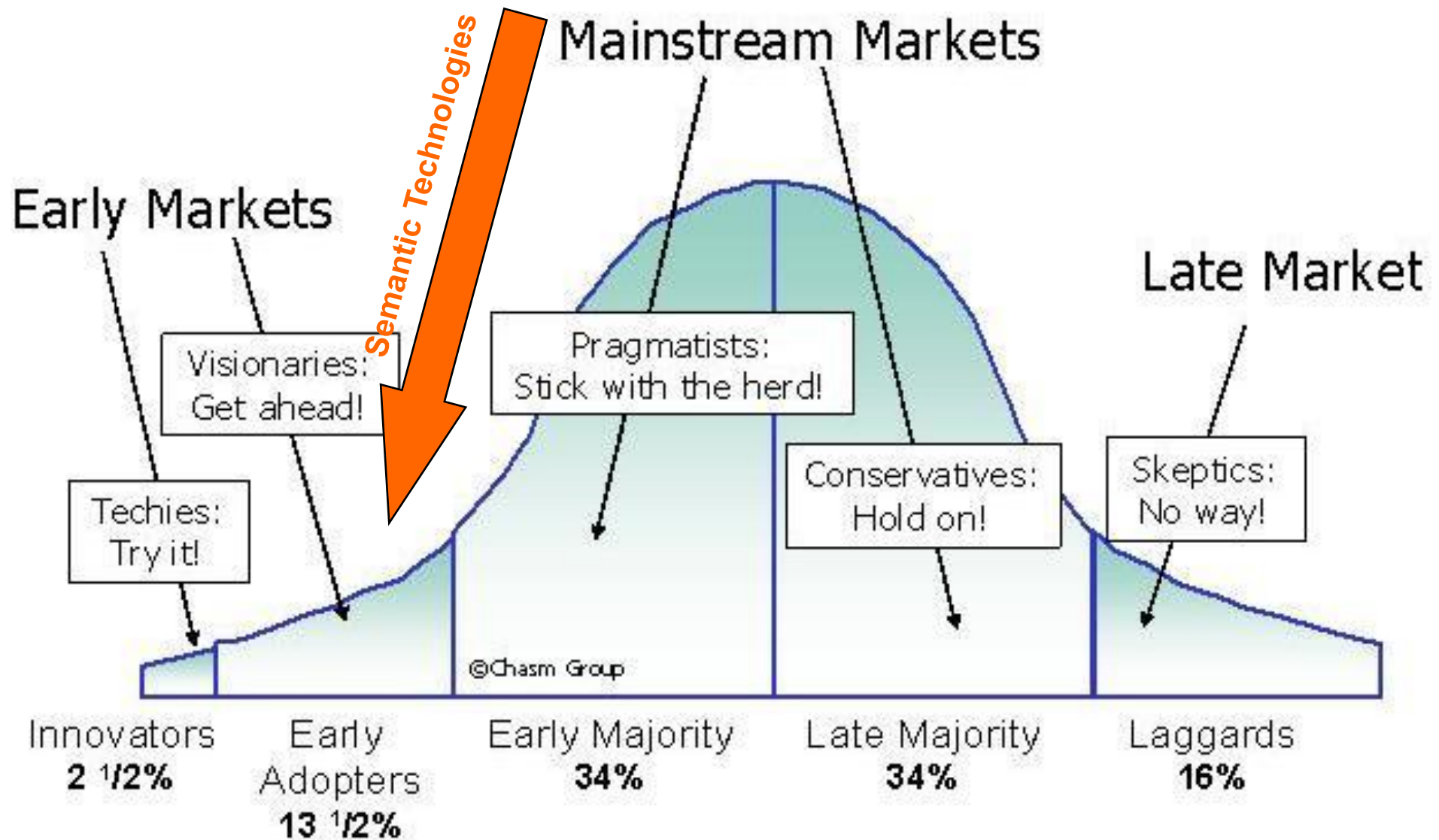


... where **Subjects, Properties, Values** can each have their own **URI**, and thus are **universally unique and linkable across the Web**

- Web becomes a global, relational database
- [Semantic Web Activity](#) @ W3C
  - URIs, [RDF](#) (above), [Web Ontology Language](#)
  - [Query](#), [Rules](#), [Content Labeling](#), [Case Studies and Use Cases](#)

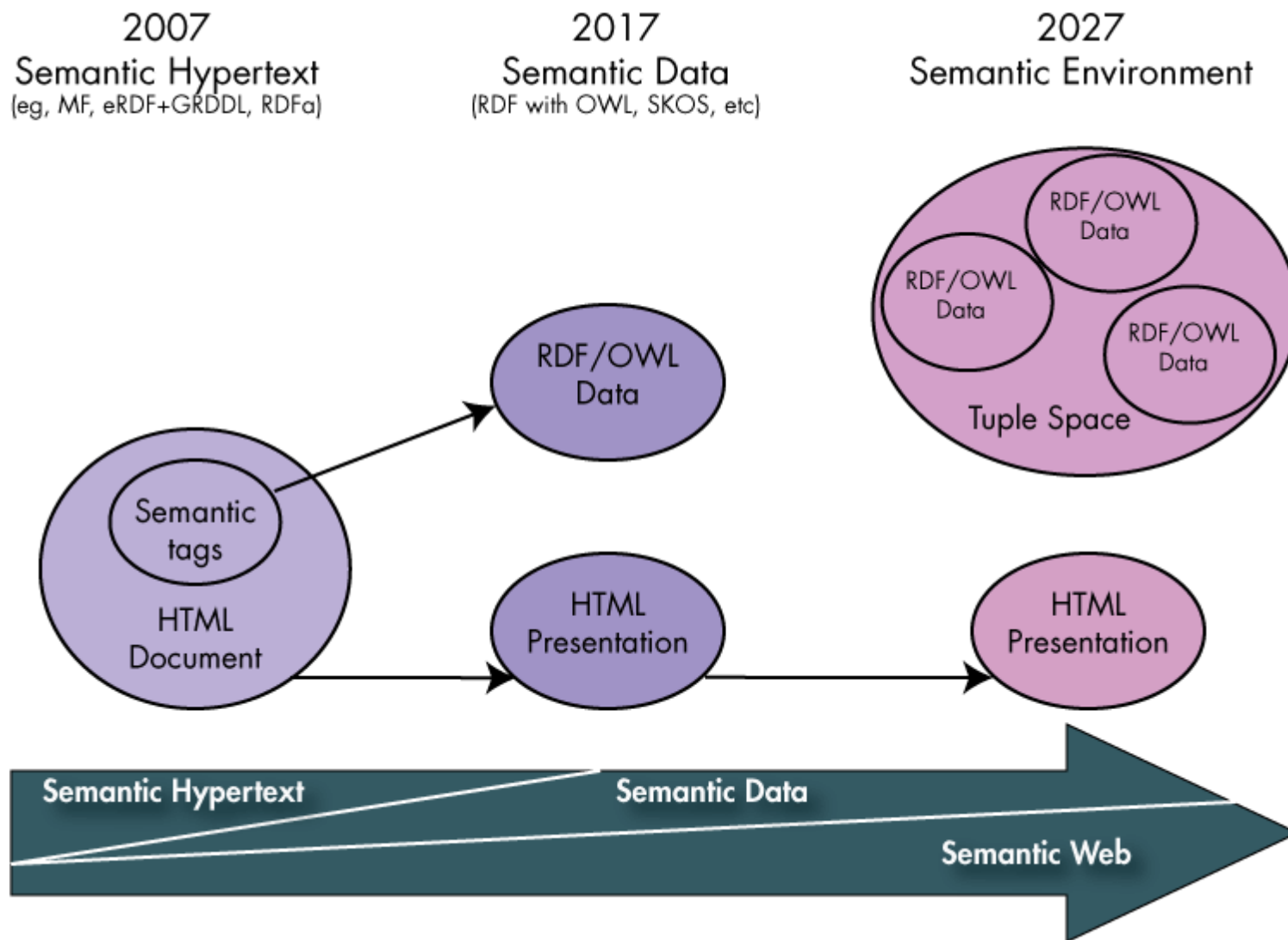
\*[New York Times](#), [InternetNews](#)

# Technology Adoption Life Cycle





# The 2007 Gartner Predictions



*See extra slides at end regarding how Semantic Web may grow, and a C-level guide to getting started.*

Based on: "Finding and Exploiting Value in Semantic Web Technologies on the Web", Gartner Research Report, May 2007

# What We Are Seeing

- Domains such as
  - digital libraries, defense, eGovernment, energy sector, financial services, health care, life sciences, oil and gas industry ...

... are showing interest and organizing themselves.
- Organizations with ...
  - complex data management and challenges
  - intellectual interest and resources

... are starting to employ Semantic technologies.
- Major companies offer (or will offer) Semantic Web tools, using Semantic technologies and often participating in W3C:
  - Adobe, Oracle, IBM, HP, Software AG, GE, Northrop Gruman, Altova, Dow Jones, Novartis, Boeing, Pfizer, Telefónica, ILOG, HP, Agfa, SRI International, Fair Isaac Corp., Oracle, Boeing, IBM, Chevron, Siemens, Nokia, Merck, Pfizer, AstraZeneca, Sun, Eli Lilly, ...

# Semantic Web Education and Outreach Group

- At present there are
  - 16 case studies and 10 use cases (October 2007)
  - from 11 different countries around the globe
  - activity areas of submitters include: automotive, broadcasting, financial institution, health care, oil & gas industry, pharmaceutical, public and governmental institutions, publishing, telecommunications, ...
  - usage areas include: data integration, portals with improved local search, business organization, B2B integration, ...
- Remember this URI:  
<http://www.w3.org/2001/sw/sweo/public/UseCases/>

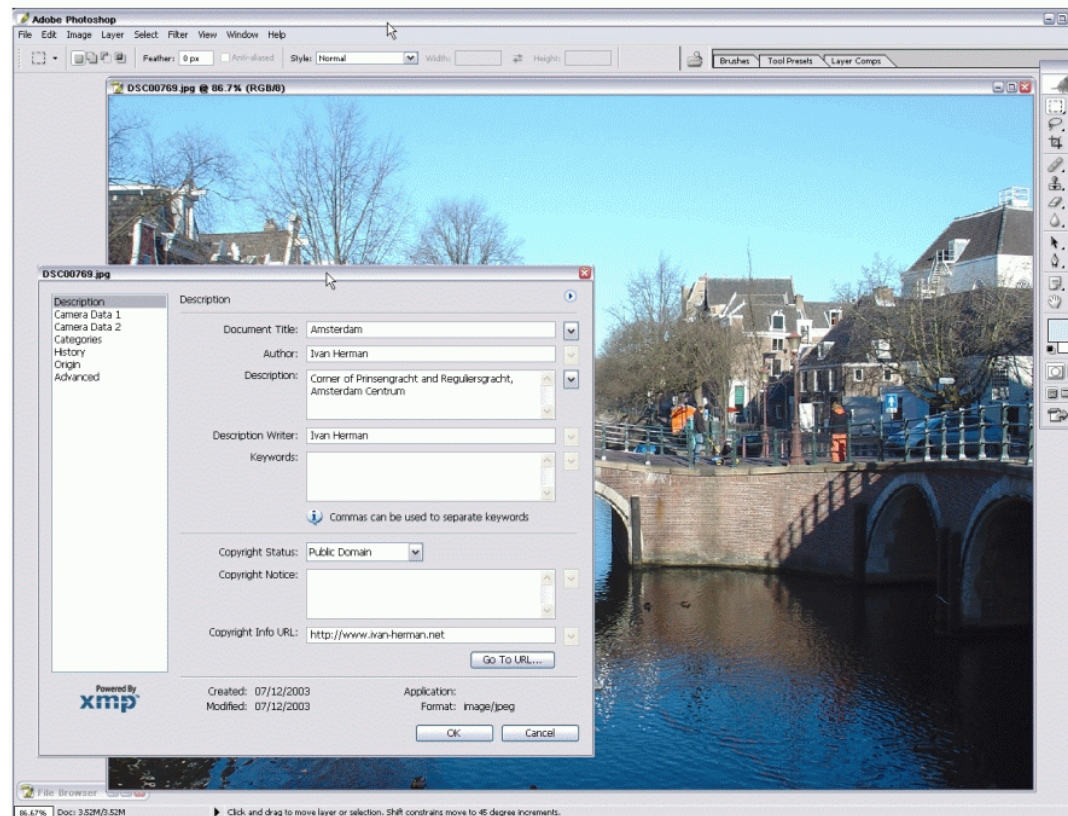
# Survey of Semantic Technologies Used in the Oil and Gas Industry

- Fluor's Accelerating Deployment of ISO 15926 project targets integration, exchange, and hand-over of information in process industries during the life cycle of a plant.
- [InfoWeb](#), a plant data specialist in the Netherlands, leverages the Semantic Web for developing the ISO 15926 knowledge base
- The Norwegian Daily Production Report (DPR) project is standardizing production data reporting, making it more accessible for authorities and license partners.
- The [Active Knowledge Systems for Integrated Operations](#) project is developing an integrated system in historical and realtime data and knowledge management to support drilling operations.
- The Integrated Information Platform project sponsored by the Norwegian Research Council, aims to create an information platform for the industry by integrating ontologies from several industrial data and technology standards and also by creating new ontologies.

Courtesy of Frank Chum, Chevron ([SWEO Use Case](#))

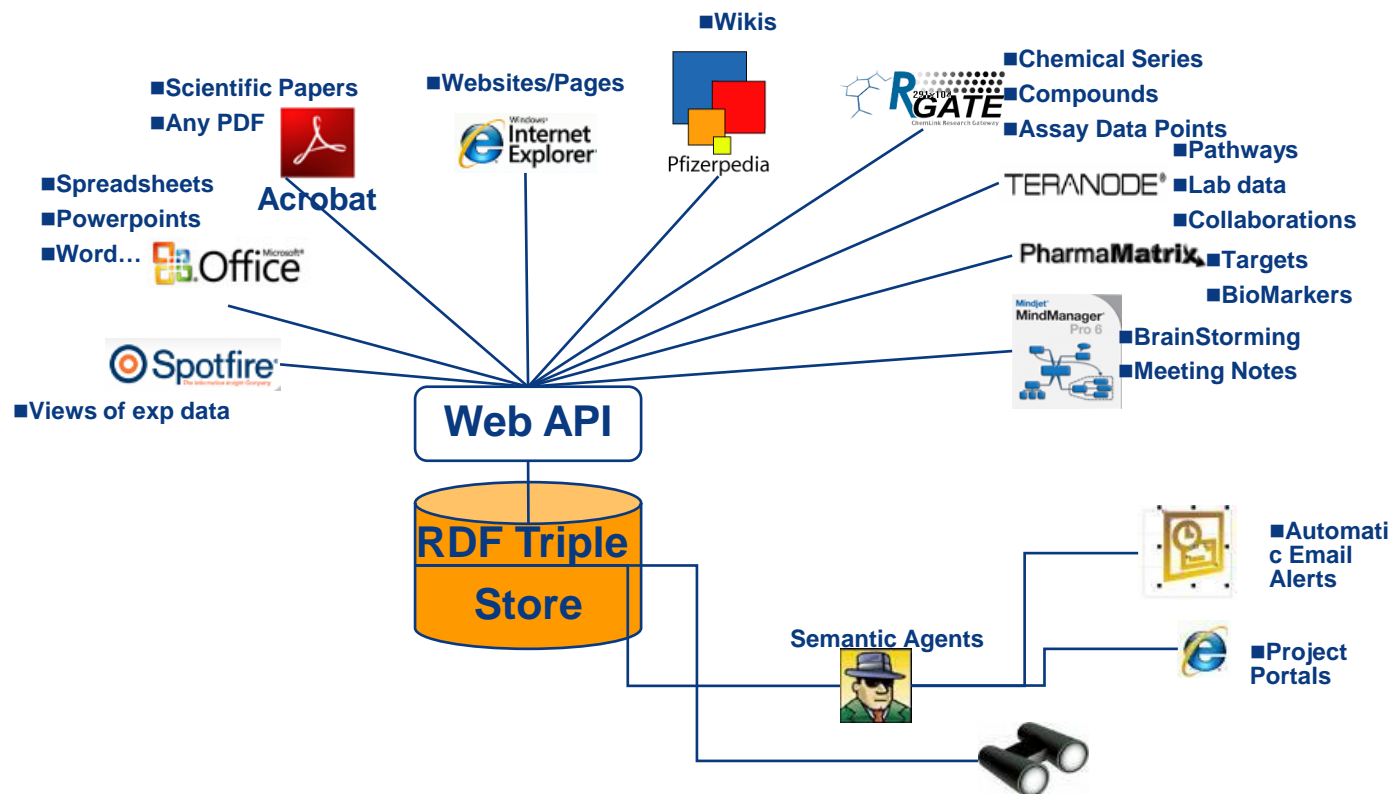
# Adobe's XMP

- Metadata is added by, e.g., Photoshop into files in RDF
- XMP is a way of embedding + vocabulary + a set of (public) tools (there are also 3<sup>rd</sup> party tools to extract the RDF content)
- Used by a number of platform solutions



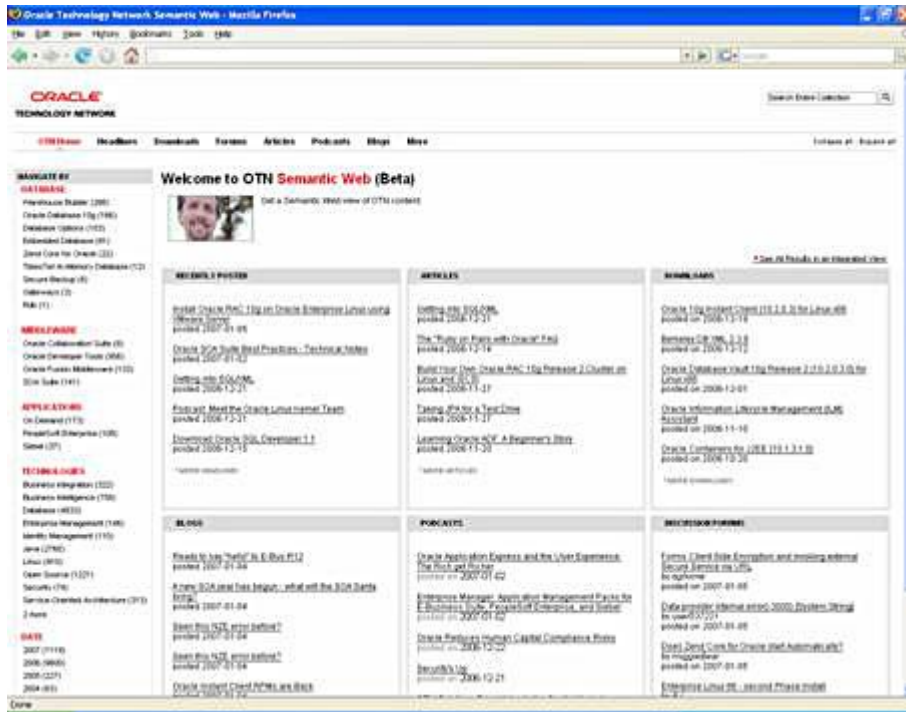
# Ontology Controlled Annotation

- Annotation of different data formats all along the full drug discovery process...

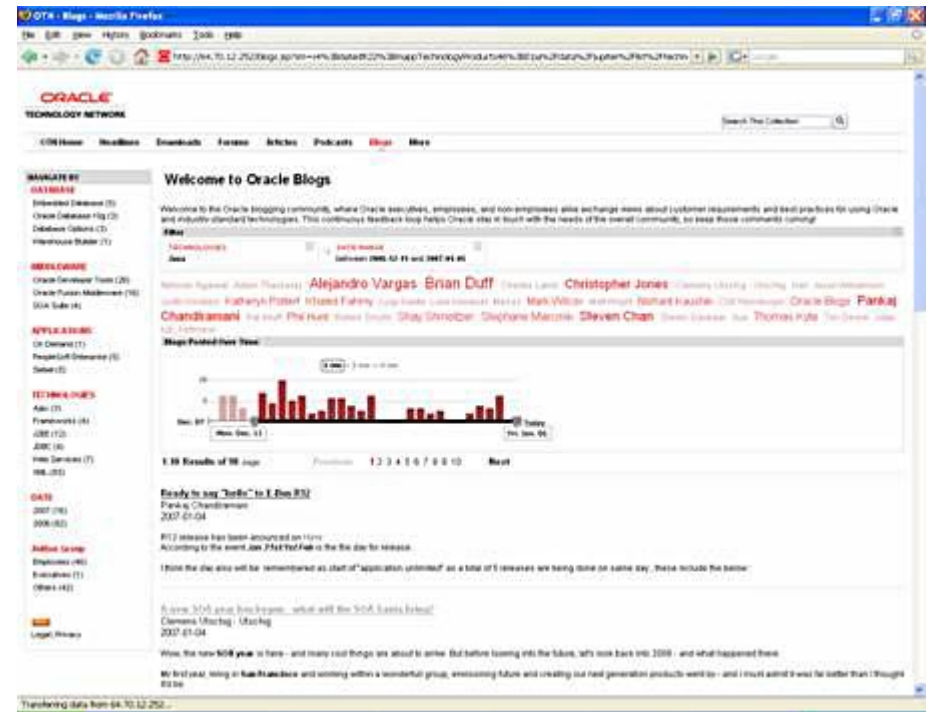




# Oracle's Technology Network Portal



Aggregates many source of content

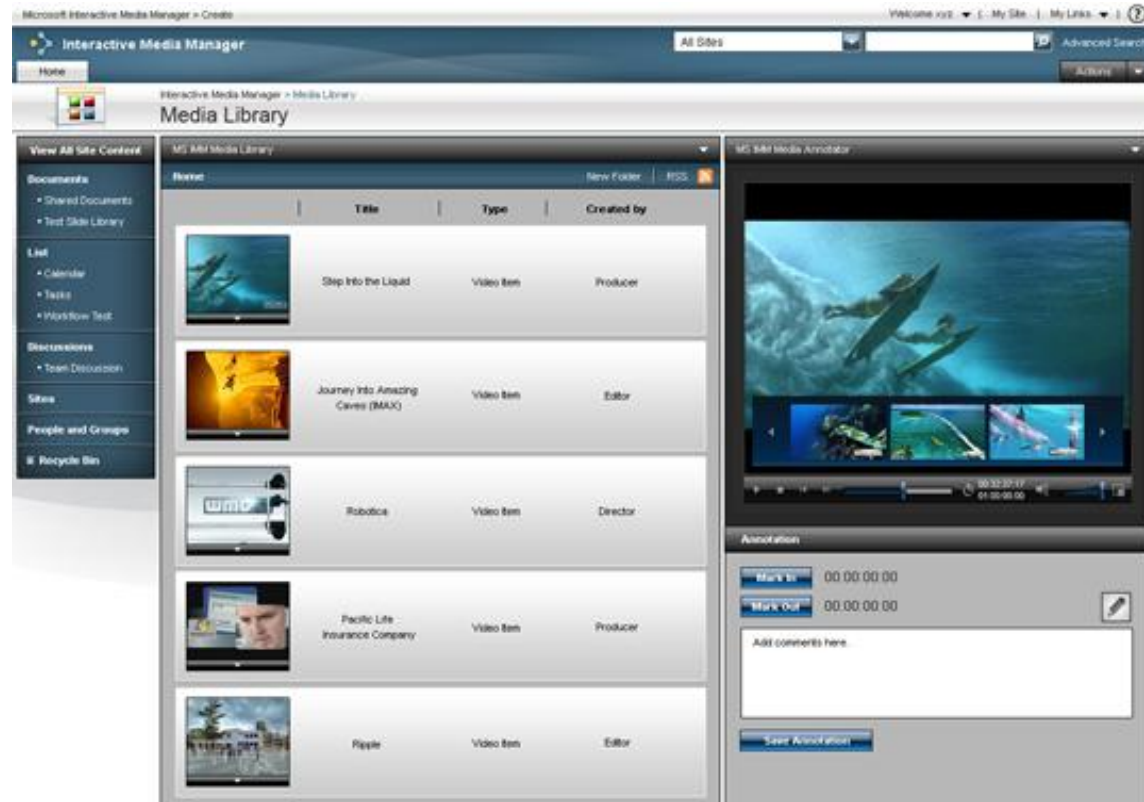


Re-group, categorize, etc content (using a taxonomy)

Courtesy of Mike DiLascio, Siderean Software, and Justin Kestelyn, Oracle Corporation ([SWEQ Case Study](#))

# Microsoft Vista's Interactive Media Manager

- Uses an RDF/SPARQL/OWL based metadata framework
  - eg, for a better control over relationships among media assets and categories
- Custom OWL ontologies can be created and imported





# Repair and Diagnostics Documentation

- Store repair and diagnostic operations in a repository with an OWL model
- A “diagnostic engine” generates the manuals on the fly, using RDF for information exchange

Effectuez le test suivant :

**Connecteur du calculateur de clim régulée - Contrôle visuel (1 mn)**

Opérations préliminaires

- ▶ Autoradio "Haut de gamme" - Dépose (4 mn)
- ▶ Radio Navigation - Dépose (3 mn)
- ▶ Console centrale - Dépose (7 mn)
- ▶ Garniture de bas de planche de bord - Déclipper (1 mn)
- ▶ Garniture centrale - Dépose (3 mn)
- ▶ Tableau de commande de climatisation régulée - Dépose (7 mn)
- ▶ Connecteur du calculateur de clim régulée - Accés (0 mn)

Vérifier le branchement et l'état du connecteur

- [Connecteur du calculateur de clim régulée - Rebrancher](#)
- [Connecteur du calculateur de clim régulée - Remplacement](#)
- [Autre...](#)

Causes/Réparations possibles

13 %	Cablage moteur de recyclage - calculateur de clim régulée - Remise en état
13 %	Cablage moteur de recyclage - calculateur de clim régulée - Remplacement
13 %	Calculateur de clim régulée - Remplacement
12 %	Connecteur du calculateur de clim régulée - Rebrancher
13 %	Connecteur du calculateur de clim régulée - Remplacement

**RENAULT**

▼ Autoradio "Haut de gamme" - Dépose (4 mn)

Outillage spécialisé indispensable

Ms. 1544	Outil de dépose autoradio - Carminat Becker et Cabasse.
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Autoradio chargeur CD

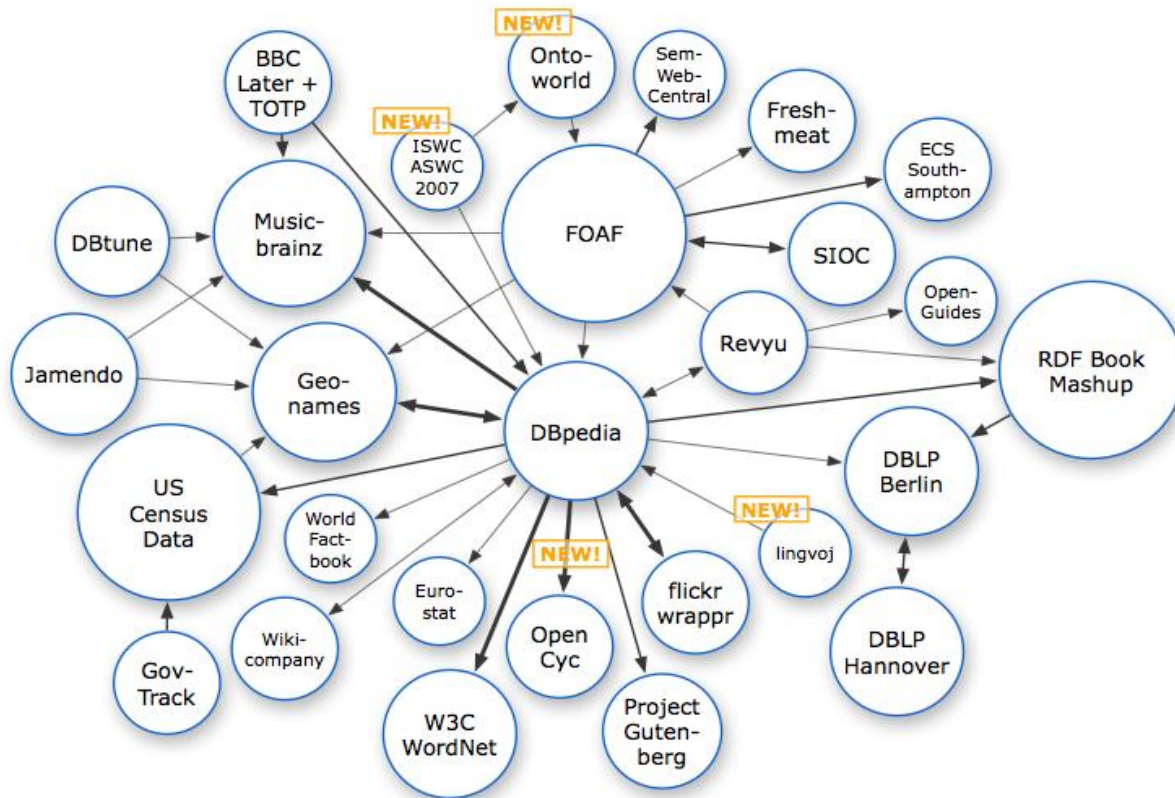
112032  
112232

- Déposer l'autoradio (1) à l'aide de l'outil (Ms. 1544).
- Débrancher les connecteurs.

Courtesy of François-Paul Servant, Renault, ([SWEO Use Case](#))

# Linking Open Data Project

- Goal: “expose” open datasets in RDF
- Set *RDF links among the data items* from different datasets
- Set up SPARQL endpoints to query the data, too
- Over 2 billion triples. 3 million “links” (November 2007)



<http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects/LinkingOpenData>

# Extracting Structured Data from Wikipedia

<http://en.wikipedia.org/wiki/Calgary>

```
<http://dbpedia.org/resource/Calgary>
dbpedia:native_name "Calgary" ;
dbpedia:altitude "1048" ;
dbpedia:population_city "988193" ;
dbpedia:population_metro "1079310" ;
dpbedia:mayor_name
    dbpedia:Dave_Bronconnier ;
dpbedia:governing_body
    dbpedia:Calgary_City_Council ;
...
```

Calgary	
	
Downtown Calgary.	
<b>Government</b>	
- Mayor	Dave Bronconnier (Past mayors)
- Governing body	Calgary City Council
- Manager	Owen A. Tobert
<b>Area</b> <sup>[1]</sup>	
- City	726.50 km <sup>2</sup> (280.5 sq mi)
- Metro	5,107.43 km <sup>2</sup> (1,972 sq mi)
<b>Elevation</b>	1,048 m (3,438.3 ft)
<b>Population</b> (2006) <sup>[1]</sup>	
- City	988,193
- Density	1,360.2/km <sup>2</sup> (3,522.9/sq mi)
- Metro	1,079,310
- Population rank	3rd
- Metro rank	5th

*Courtesy of Chris Bizer, Free University of Berlin*

# Automatic Links Among Open Datasets

```
<http://dbpedia.org/resource/Calgary>  
  owl:sameAs <http://sws.geonames.org/5913490>;  
  ...
```

DBpedia

```
<http://sws.geonames.org/5913490>  
  owl:sameAs <http://DBpedia.org/resource/Calgary>  
  wgs84_pos:lat "51.050112282";  
  wgs84_pos:long "-114.085285152";  
  sws:population "968460"  
  ...
```

Geonames

Processors can switch automatically from one to the other...

# Deployment @ W3C

- **Increasing focus on end users**

- Supports application of standards to real, important problem
- Improves standards: Use cases, requirements, implementation, testing

- **Health Care and Life Sciences**

- "use of Semantic Web technologies ... to improve collaboration, research and development, and innovation adoption"
- Agfa, AstraZeneca, Cleveland Clinic, Eli Lilly, HL7, Merck, Partners, Pfizer (60+ participants from 40 organizations)



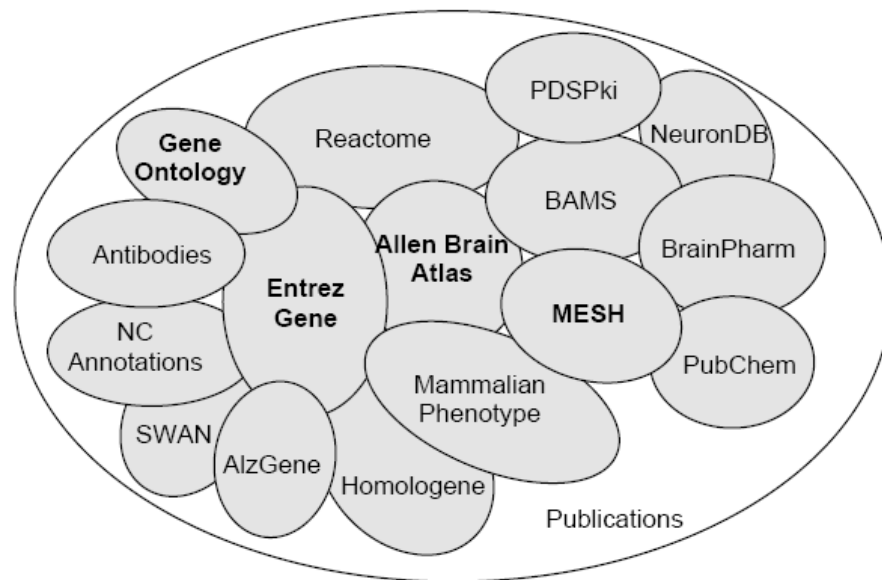


# Sample HCLS Task Forces

- **BioRDF.** Expose biomedical data to RDF/OWL
- **BIONT.** Support ontology needs for other groups
- **Drug Safety and Efficacy.** Support monitoring drug safety, pharmacovigilance.
- **Adaptable Clinical Protocols and Pathways.** Represent and compute applicability of protocols to dynamically changing patient status
- **Clinical Observations Interoperability.** Establish new collaboration with health care industry players, and work on issues at intersection of electronic medical records and health care org. needs.

# Integrating Key Datasets

- W3C HCLS IG has already exposed a number of public datasets and ontologies in RDF and OWL
  - assign URI-s to bio entities
  - data converted or made reachable in RDF
  - use reasoners to infer extra triples to increase expressiveness
  - query the data with SPARQL and visualization tools
  - around 400M triples so far...



# Use SPARQL to Query ...

*“find me genes involved in signal transduction that are related to pyramidal neurons”*

```
prefix go: <http://purl.org/obo/owl/GO#>
prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>
prefix owl: <http://www.w3.org/2002/07/owl#>
prefix mesh: <http://purl.org/commons/record/mesh/>
prefix sc: <http://purl.org/science/owl/sciencecommons/>
prefix ro: <http://www.obofoundry.org/ro/ro.owl#>

select ?genename ?processname
where
{
  graph <http://purl.org/commons/hcls/pubmesh>
  {
    ?paper ?p mesh:D017966 .
    ?article sc:identified_by_pmid ?paper
    ?gene sc:describes_gene_or_gene_product_mentioned_by ?article.
  }
  graph <http://purl.org/commons/hcls/goa>
  {
    ?protein rdfs:subClassOf ?res.
    ?res owl:onProperty ro:has_function.
    ?res owl:someValuesFrom ?res2.
    ?res2 owl:onProperty ro:realized_as.
    ?res2 owl:someValuesFrom ?process.
  }
  graph <http://purl.org/commons/hcls/20070416/classrelations>
  {
    {?process <http://purl.org/obo/owl/obo#part_of> go:GO_0007166}
    union
    {?process rdfs:subClassOf go:GO_0007166 }}
  }
  graph <http://purl.org/commons/hcls/gene>
  {
    ?gene rdfs:label ?genename }
  graph <http://purl.org/commons/hcls/20070416>
  {
    ?process rdfs:label ?processname }
}
```

Mesh: Pyramidal Neurons



Pubmed: Journal Articles



Entrez Gene: Genes



GO: Signal Transduction

*Inference required*

Courtesy of Susie Stephens, Eli Lilly, Alan Ruttenberg, Science Commons, and the W3C HCLS IG



# Results that Make Sense to Experts ...

Many of the genes are indeed related to Alzheimer's Disease through gamma secretase (presenilin) activity

DRD1, 1812	adenylate cyclase activation
ADRB2, 154	adenylate cyclase activation
ADRB2, 154	arrestin mediated desensitization of G-protein coupled receptor protein signaling pathway
DRD1IP, 50632	dopamine receptor signaling pathway
DRD1, 1812	dopamine receptor, adenylylase activating pathway
DRD2, 1813	dopamine receptor, adenylylase inhibiting pathway
GRM7, 2917	G-protein coupled receptor protein signaling pathway
GNG3, 2785	G-protein coupled receptor protein signaling pathway
GNG12, 55970	G-protein coupled receptor protein signaling pathway
DRD2, 1813	G-protein coupled receptor protein signaling pathway
ADRB2, 154	G-protein coupled receptor protein signaling pathway
CALM3, 808	G-protein coupled receptor protein signaling pathway
HTR2A, 3356	G-protein coupled receptor protein signaling pathway
DRD1, 1812	G-protein signaling, coupled to cyclic nucleotide second messenger
SSTR5, 6755	G-protein signaling, coupled to cyclic nucleotide second messenger
MTNR1A, 4543	G-protein signaling, coupled to cyclic nucleotide second messenger
CNR2, 1269	G-protein signaling, coupled to cyclic nucleotide second messenger
HTR6, 3362	G-protein signaling, coupled to cyclic nucleotide second messenger
GRIK2, 2898	glutamate signaling pathway
GRIN1, 2902	glutamate signaling pathway
GRIN2A, 2903	glutamate signaling pathway
GRIN2B, 2904	glutamate signaling pathway
ADAM10, 102	integrin-mediated signaling pathway
GRM7, 2917	negative regulation of adenylylase activity
LRP1, 4035	negative regulation of Wnt receptor signaling pathway
ADAM10, 102	Notch receptor processing
ASCL1, 429	Notch signaling pathway
HTR2A, 3356	serotonin receptor signaling pathway
ADRB2, 154	transmembrane receptor protein tyrosine kinase activation (dimerization)
PTPRG, 5793	transmembrane receptor protein tyrosine kinase signaling pathway
EPHA4, 2043	transmembrane receptor protein tyrosine kinase signaling pathway
NRTN, 4902	transmembrane receptor protein tyrosine kinase signaling pathway
CTNND1, 1500	Wnt receptor signaling pathway

*Courtesy of Susie Stephens, Eli Lilly, Alan Ruttenberg, Science Commons, and the W3C HCLS IG*

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# Opportunities for the Oil and Gas Industry

- How to move forward
- Discussion

# Potential Value of Working in W3C

- **Leadership**
  - Introduce ideas through [submissions](#), [workshops](#), [Incubator Groups](#)
  - Influence standards => [Working Groups](#), review, implementation
- **Early insight into market trends**
  - Access world's top Web technologists from [Members](#) and [Team](#)
  - Plan for emerging technologies & markets through [Member access](#)
- **Productive, Neutral Environment**
  - People, process, experience, collaboration tools, global scope
- **Promoting image as innovator**
  - Participate in int'l media activities, [press releases](#), testimonials
  - Display logo on [W3C site](#) (300K visits/day) & [W3C logo](#) on your site

*([Membership](#) / [Benefits](#) / [How to join W3C](#) / ["At a Glance" brochure](#))*

# Interest in a Energy Industry Group?

- Chevron has been a W3C Member since 2000. POSC Caesar is joining. Many vendors here.
- Candidate “next steps” for discussion:
  - Engage more domain experts and companies.
  - Develop liaisons with relevant industry organizations
  - Send a “Fellow” to W3C
  - Organize a W3C workshop
  - Create an Interest Group
    - ... to explore, prototype, build community
  - Create an Incubator Group
    - To develop requirements, use cases, draft specifications, ontologies quickly
  - Created a Working Group
    - ... to create Web standards

# For more information



<http://www.w3.org/>

W3C Membership:

<http://www.w3.org/Consortium/membership>

*Thanks to Ivan Herman, W3C, and colleagues in the Semantic Web Education and Outreach group for compiling most of the sample applications presented in these slides.*

# Extra Slides Follow

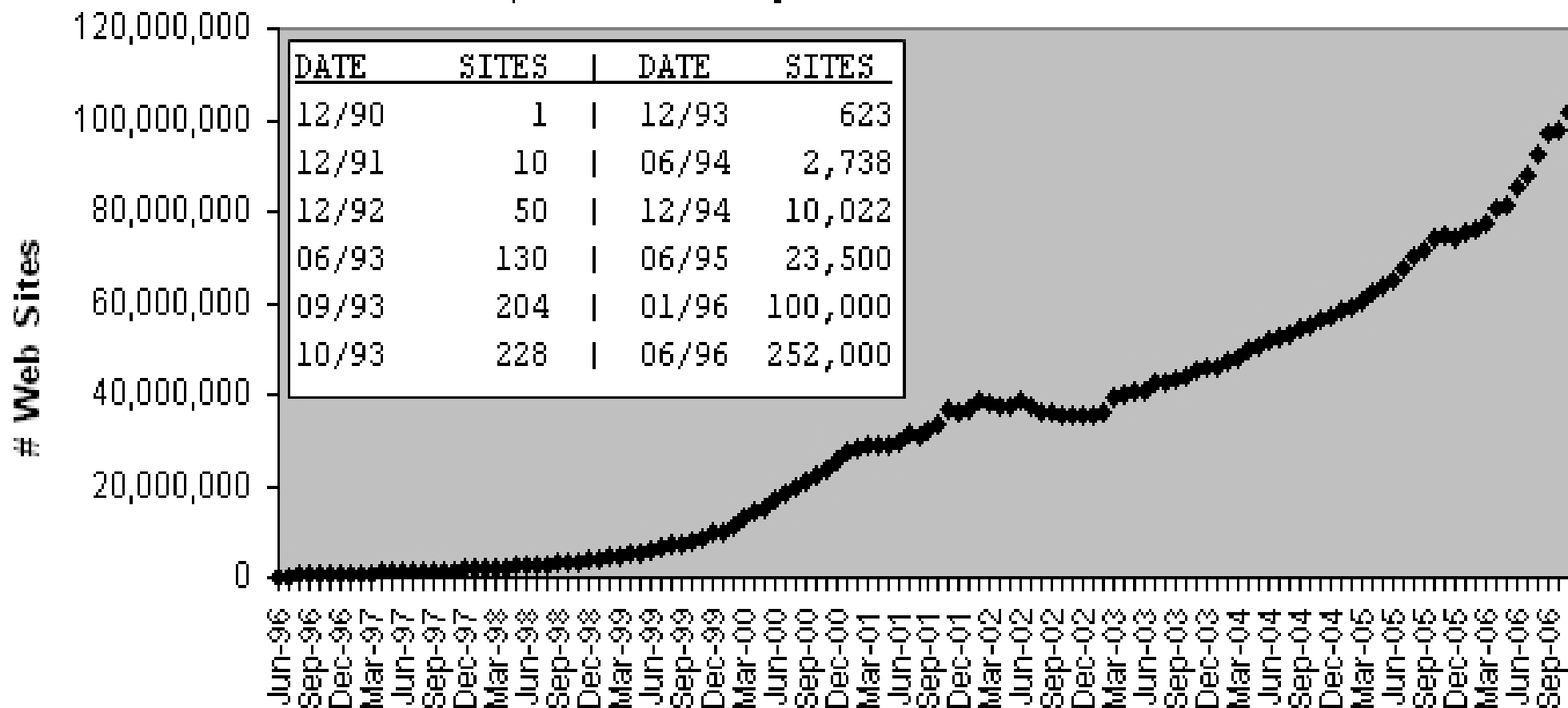
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- Extra slides follow
  - How the Semantic Web is taking off
  - C-level do-s and don't-s for leveraging Semantic technologies
  - Additional examples

# Internet Growth Driven by Open Web & Standards

Hobbes' Internet Timeline Copyright ©2006 Robert H Zakon

<http://www.zakon.org/robert/internet/timeline/>



Sources: <http://www.zakon.org/robert/internet/timeline/>

<http://www.internetworldstats.com/stats.htm>

# May start with small communities

- The needs of a deployment application area:
  - have serious problem or opportunity
  - have the intellectual interest to pick up new things
  - have motivation to fix the problem
  - its data connects to other application areas
  - have an influence as a showcase for others
- The high energy physics community played this role for the Web in the 90's



# Some deployment communities

- Some examples: digital libraries, defense, eGovernment, energy sector, financial services, health care, oil and gas industry, life sciences ...
- Health care and life science sector is now very active
  - also at W3C, in the form of an Interest Group

# CEO guide for SW: the “DO-s”

- **Start small:** Test the Semantic Web waters with a pilot project [...] before investing large sums of time and money.
- **Check credentials:** A lot of systems integrators don't really have the skills to deal with Semantic Web technologies. Get someone who's savvy in semantics.
- **Expect training challenges:** It often takes people a while to understand the technology. [...]
- **Find an ally:** It can be hard to articulate the potential benefits, so find someone with a problem that can be solved with the Semantic Web and make that person a partner.

Source: [BusinessWeek Online](#), April 2007

# CEO guide for SW: the “DON’T-s”

- **Go it alone:** The Semantic Web is complex, and it's best to get help. [...]
- **Forget privacy:** Just because you can gather and correlate data about employees doesn't mean you should. Set usage guidelines to safeguard employee privacy.
- **Expect perfection:** While these technologies will help you find and correlate information more quickly, they're far from perfect. Nothing can help if data are unreliable in the first place.
- **Be impatient:** One early adopter at NASA says that the potential benefits can justify the investments in time, money, and resources, but there must be a multi-year commitment to have any hope of success

Source: [BusinessWeek Online](#), April 2007

# Find the right experts at NASA

- Expertise locator for nearly 20,000 NASA civil servants using RDF integration techniques over 6 or 7 geographically distributed databases, data sources, and web services...

The screenshot displays the POPS v.28.3 interface, titled "Connected to 'POPS on FatDuck' - Using Model 'POPS on FatDuck Model' - Logged in as 'Andy'". The interface is divided into several panes:

- NASA Center (13):** A list of NASA centers including ARC, DFRC, GRC, GSFC, HQ, IVV, JSC, KSC, LARC, MAF, MSFC, SSC, and WSTF. The source is x500.
- Project (79):** A list of project categories such as Advanced Info Systems technology, Advanced Studies, Concepts and Tool..., Advanced Technology Initiatives, Aeronautics Research Mission Directo..., Agency Support, Aqua, Aquarius, Cassini, Center Investment Accounts, Chandra, Cloud-Aerosol Lidar and Infrared Pat..., Constellation Systems Program Support, and Contract Management. The source is WIMS.
- Competency (21):** A list of competencies including Acquisition Planning, Acquisition and Contract Management, Budgeting Management, Business IT Systems, Business Management, Business Work & Team Management, Contract Formation, Contract Management and Performan..., Cost Estimation and Analysis, Employee & Team Leadership, Executive Management, Financial Management, and Governmental Affairs. The source is CMS.
- People (2):** A list of names: Altonell L Mumford and Michael J Milsted. The source is x500.

The **Information Panel** at the bottom left shows details for Michael J Milsted:

- Has Employer:** NASA
- firstName:** Michael
- phone:** +1 202 358-4728
- email:** michael.j.milsted@nasa.gov
- LDAP DN:** cn=Michael Milsted-1,ou=Headquarters,ou=National Aeronautics And Space Administration,c=US
- Has Department:** CH1000
- Room Number:** 7F15
- Works On Project:** Space Operations Mission Directorate, Agency Support
- Has Competency:** Business Management, Business Operations Competency Suite, Business Knowledge Domain, Budgeting Management, Financial Operations Competency Suite, Cost Estimation and Analysis, Program/Project Analysis

The **View Different Social Network's in the POPS Data** panel shows a network graph with Michael J Milsted at the center. The graph is titled "View Different Social Network's in the POPS Data" and includes a legend:

- Red line: Same Skill and Same Department
- Green line: Same Skill and Same Project
- Blue line: Same Skill, Project, and Facility
- Purple line: Am I Connected? (Experimental)

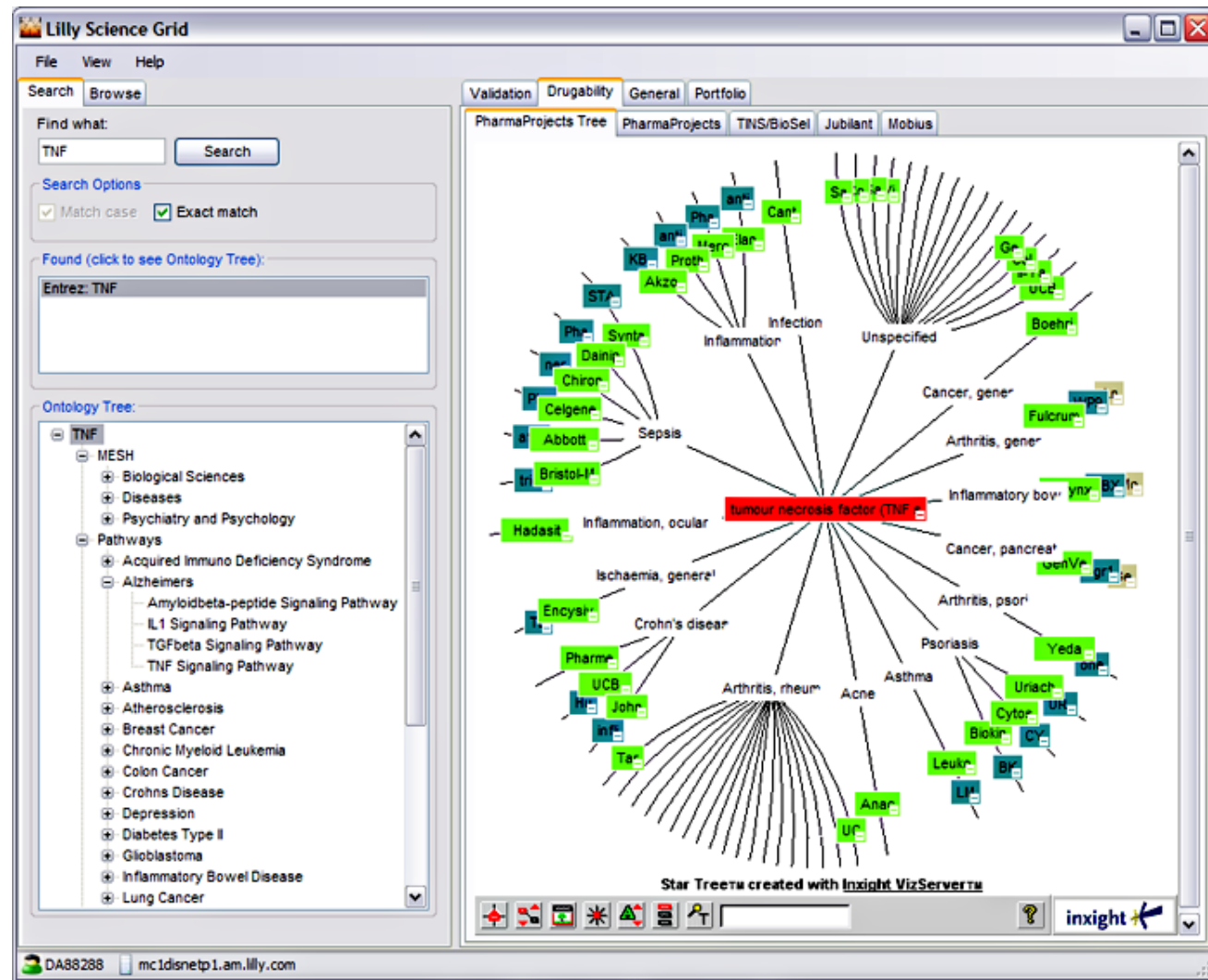
The graph shows connections to various other individuals, including Barbara J Manthos, Charles D Mathew, Jose R Walton, Jay Davis, Michele M Lewis, Altonell L Mumford, Michael J Milsted, Joseph T Chang, Angela Davis, Lynne A, David F Lurie, and Winfred Martz. The interface also includes navigation buttons (left and right arrows) and a "Social Net Query Alternate Paths" button.

Courtesy of Kendall Clark, Clark & Parsia, LLC

# Eli Lilly's Target Assessment Tool

Better prioritization of possible drug target, integrating data from different sources and formats

Integration, search, etc, via ontologies (proprietary and public)



Courtesy of Susie Stephens, Eli Lilly ([SWEQ Case Study](#))



# Applications may be relatively simple

- Goal: reuse of older experimental data
- Keep data in databases or XML, just export key “facts” as RDF
- Use a faceted browser to visualize and interact with the result

**Internal Compound Repurposing Example**

Welcome, Allergy & Respiratory Team Member

This tool allows you to identify opportunities for additional uses of compounds from other teams within your project. It combines internal data, public data and the results of data mining experiments to provide testable hypotheses.

Control Panel & Item Filtering

Area	5/2	Approach	3/2	Term+Reason	1/2	Max_Stage_Reached	1/2	Literature Links
2/0 Pain	<input checked="" type="checkbox"/>	7 Antibody	<input type="checkbox"/>	37 ACTIVE	<input type="checkbox"/>	51 Candidate	<input checked="" type="checkbox"/>	0 - 50
1/6 Metabolic Disease	<input checked="" type="checkbox"/>	1 Recombinant	<input type="checkbox"/>	12 BICMARKER	<input type="checkbox"/>	10 Discovery	<input type="checkbox"/>	
0 Cancer	<input type="checkbox"/>	18 SM_Agonist	<input checked="" type="checkbox"/>	51 EFFICACY	<input checked="" type="checkbox"/>	41 Exploratory	<input type="checkbox"/>	

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2/0 Pain	<input checked="" type="checkbox"/>	7 Antibody	<input type="checkbox"/>	37 ACTIVE	<input type="checkbox"/>	51 Candidate	<input checked="" type="checkbox"/>	0 - 50
1/6 Metabolic Disease	<input checked="" type="checkbox"/>	1 Recombinant	<input type="checkbox"/>	12 BICMARKER	<input type="checkbox"/>	10 Discovery	<input type="checkbox"/>	
0 Cancer	<input type="checkbox"/>	18 SM_Agonist	<input checked="" type="checkbox"/>	51 EFFICACY	<input checked="" type="checkbox"/>	41 Exploratory	<input type="checkbox"/>	
3 Sexual Health	<input checked="" type="checkbox"/>	12 SM_Antagonist	<input checked="" type="checkbox"/>	11 MARKET	<input checked="" type="checkbox"/>	11 HTS	<input type="checkbox"/>	
2 Infectives	<input checked="" type="checkbox"/>	21 SM_Inhibitor	<input checked="" type="checkbox"/>	11 REORG	<input type="checkbox"/>	11 Phase I	<input type="checkbox"/>	
1 Urogenitals	<input checked="" type="checkbox"/>		<input type="checkbox"/>	10 TOXIC	<input type="checkbox"/>	11 Phase III	<input type="checkbox"/>	
						41 Screening	<input type="checkbox"/>	

51 items (filtered from 710 originally) (Reset All Filters)

Area	Original+Indication	Target_Name	Approach	Start	Term+Reason	Max_Stage_Reached	Owner	OMD	Lit_All	Lit_Lit_2007	Lit_Neigh	IMA	GED	Pathway	Compounds
Metabolic Disease	Diabetes	Liver glycogen phosphorylase	SM_Inhibitor	2007-Q2	EFFICACY	Candidate	P. Person								SW-030072
Sexual Health	Erectile Dysfunction	Integrin alpha-3 (Galactosyltransferase 8) (VLA-3) (CD49C)	SM_Antagonist	2006-Q3	EFFICACY	Candidate	P. Person					1			SW-029762
Sexual Health	Erectile Dysfunction	Leukotriene C4 synthase	SM_Agonist	2006-Q3	EFFICACY	Candidate	M. Manager				1	1			SW-029638
Sexual Health	Erectile Dysfunction	transcription elongation factor A (SII)-like 4	SM_Inhibitor	2005-Q2	EFFICACY	Candidate	P. Person								SW-029926
Infectives	HIV	Putative four repeat ion channel (I <sub>h</sub> )	SM_Inhibitor	2006-Q2	EFFICACY	Candidate	L. Leader								SW-029994
Infectives	HIV	Voltage-gated potassium channel protein KV1.2 (D)	SM_Agonist	2007-Q1	EFFICACY	Candidate	A. Scientist						1		SW-029653
Urogenitals	Incontinence	Human RNA binding motif (RBM) gene, partial cds.	SM_Agonist	2007-Q3	EFFICACY	Candidate	L. Leader							1	SW-029684
Pain	Migraine	Monocarboxylate transporter homologue 2 (SLC18A1) (D)	SM_Inhibitor	2007-Q3	EFFICACY	Candidate	L. Leader			18					SW-030085

Courtesy of Nigel Wilkinson, Lee Harland, Pfizer Ltd, Melliyal Annamalai, Oracle ([SWEQ Case Study](#))

# Semantic portal for art collections

Search results - Mozilla Firefox

http://e-culture.multimedial.nl/demo/keyword?key=monet&schema=http%3A%2F%2Fwww.multimedial.nl%2Fpr

The Multimedial N e-culture Search

monet Search

Basic Search | Advanced Search | facet | Relation Search | My Collection (en nl id ru uk zh)

Search results on monet organized by category (37 results).

**Works with matching title (2)**

- Claude Monet Painting ... Sargent, John Singer
- Monet painting in his ... Renoir, Pierre Auguste

**Works created by artists with matching name (35)**

- "The Red Kerchief: Po ... Monet, Claude
- "The Stroll, Camille ... Monet, Claude
- La Corniche near Monaco Monet, Claude
- The Thames at Westminster Monet, Claude
- Water Lilies Monet, Claude

1830 1835 1840 1845 1850 1855 1860 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 1925 1930

Monet, Claude

Renoir, Pierre Auguste

Impressionist

Sargent, John Singer

Courtesy of Jacco van Ossenbruggen, CWI, and Guus Schreiber, VU Amsterdam

# Elsevier's DOPE browser

- Single interface to multiple data sources (in life sciences)
- Integration, search, etc, via thesauri and metadata in RDF(S)

The screenshot shows the DOPE Browser interface. The 'Focus Term' section displays 'Current term: acetylsalicylic acid' and 'Search for term: aspirin'. The 'Co-occurring Terms' list includes categories like 'All relevant documents' (500), 'analytical, diagnostic and therapeutic' (358), 'biological phenomena and functions' (221), 'chemicals and drugs' (443), and 'healthcare' (63). The 'Term Overlap Display' shows a network diagram with nodes for 'mortality (8/37)', 'practice guideline (4/12)', 'warfarin (3/25)', and 'blood clot lysis (23/23)'. The 'Document List' section shows the contents of 'blood clot lysis' with two entries: 1. Antithrombotic Therapy for Acute Myocardial Infarction (O'Donnell, C.J.; Rüdiker, P.M.; Hebert, P.R.; Hennelkens, C.H. (1995). Full-length article. Journal of the American College of Cardiology 25 (7), pp. 23S-29S. [http://linkinghub.elsevier.com/pii/S073510979500105D]) and 2. Can the MADIT Results Be Applied to Myocardial Infarction Patients at Hospital Discharge?.

Courtesy of Anita de Waard, Elsevier, Christiaan Fluit, Aduna, and Frank van Harmelen, VU Amsterdam ([SWEO Use Case](#))



# Semantic portal for cultural heritage

Patrimonio Cultural Cantabria Fundación Marcelino Botín

7 de Marzo de 2007

Inicio > Lugares > Cantabria

Buscador:  buscar

Periodos Personas Instituciones Patrimonio Obras/Monumentos El Proyecto

ESPECIAL - Titular del especial

**Beato de Liébana**  
Autor de comentarios al Apocalipsis, compone himno litúrgico  
Stephen Dedalus watched through the webbed window the lapidary's fingers prove a timedulled chain. Dust webbed the window and the showtrays. Dust darkened the toiling fingers with their vulture nails.

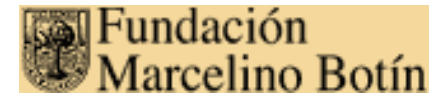
**Marcelino Sanz de Sautoula y su hija**  
descubren las pinturas de las cuevas de Altamira  
Lugares y Sitios  
Componente de Personas

**Torre medieval de Agüero La torre medieval**, de estilo gótico, fue construida en el siglo XIII

Mapa Interactivo TagCloud Linea del Tiempo

Santander Altamira Santillana del mar Iglesia románica Libro de regla Santa Juliana

Linea del Tiempo: Red Cavalry in Algeria, The Sinner at Argemou, Water Lily Duet, etc.



¿LO SABÍA?

Pulse la BARRA ESPACIADORA para visualizar el siguiente resultado de la búsqueda. Pulse SHIFT-SPACE para volver al resultado anterior.

siguiente

TÉRMINOS RELACIONADOS

- Gobierno de Cantabria
- Universidad de Cantabria
- Comunidad Autónoma de Cantabria
- Caja Cantabria
- Castro Urdiales
- San Vicente de la Barquera
- Norte de España
- Ciudad de Santander

CATEGORÍAS RELACIONADAS

- Negocios (59%)**
  - ↳ Mercado inmobiliario
  - ↳ Guías y directorios
- Viajes y turismo (36%)**
  - ↳ Rural
- Sociedad (4%)**

UBICACIÓN SITIO WEB

- Europa (72%)**
  - ↳ España
- Norteamérica (27%)**

IDIOMA DEL DOCUMENTO

- Español (82%)**
- Inglés (15%)**
- Francés (1%)**

TIPO DE DOCUMENTO

- PDF  DOC  TXT  XLS  SWF
- PPT  RTF

MODIFICAR BÚSQUDA

- ↳ Búsqueda fonética
- ↳ Buscar en los resultados

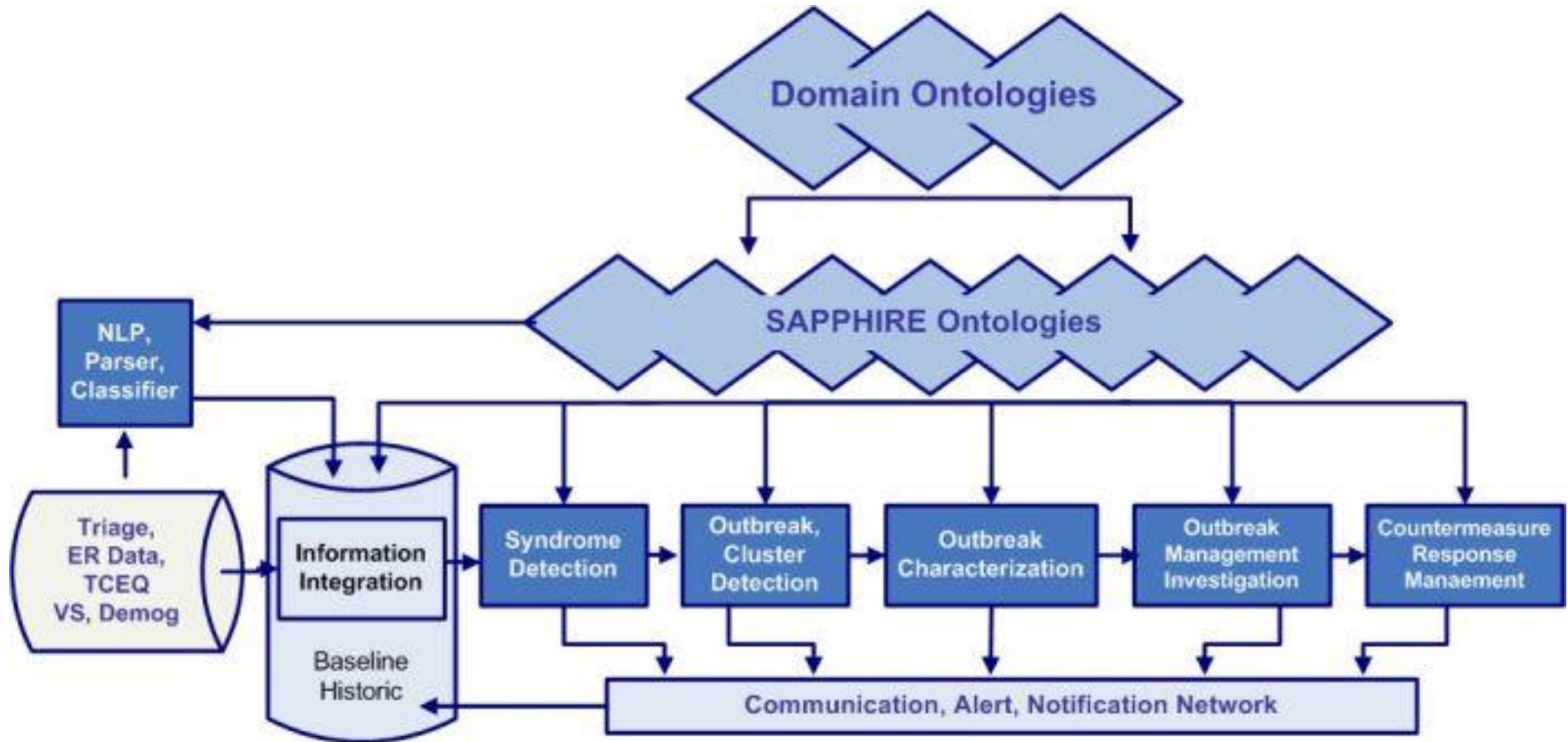
2000 A.C. Tiempo acumulado Tiempo puntual 2500 D.C.

Barra de estado

Courtesy of Francisca Hernández, Fundación Marcelino Botín, and Richard Benjamins, iSOCO, [\(SWEO Case Study\)](#)

# Public Health Surveillance (Sapphire)

- Integrated biosurveillance system (biohazards, bioterrorism, disease control, etc)

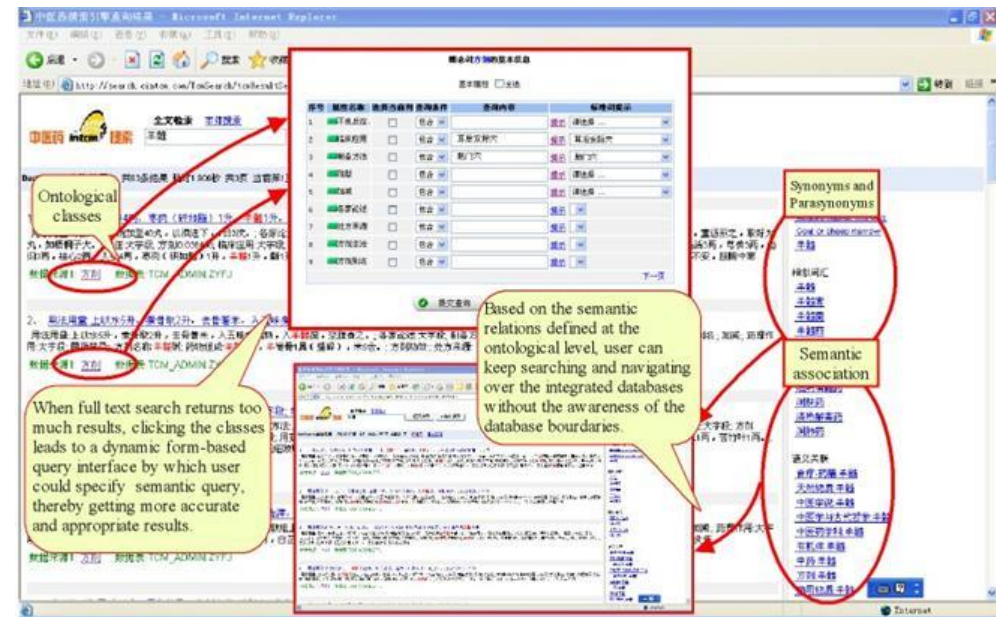
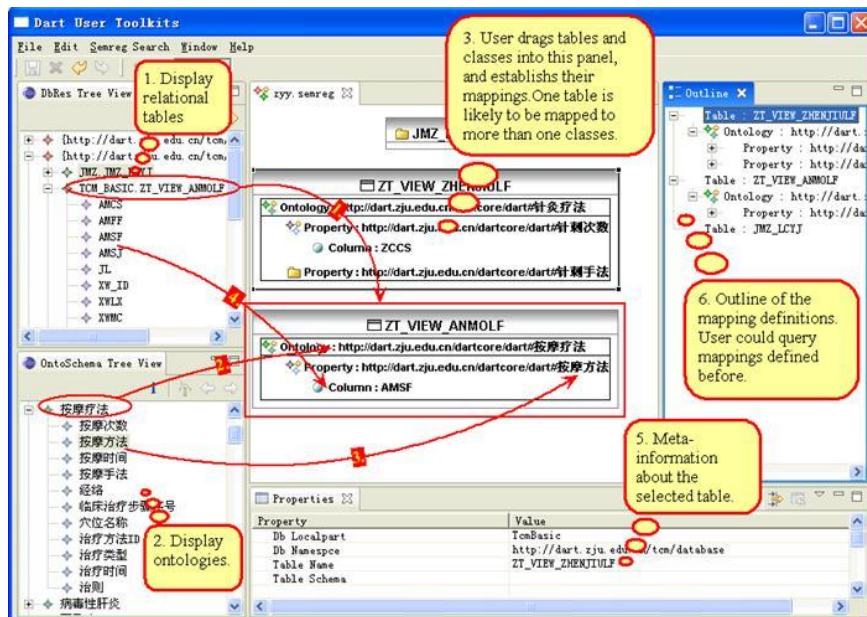


Courtesy of Parsa Mirhaji, School of Health Information Sciences, University of Texas ([SWEQ Case Study](#))



# Integrate Knowledge for Chinese Medicine

- Integration of a large number of relational databases (on traditional Chinese medicine) using a Semantic Layer
  - around 80 databases, around 200,000 records each
- A visual tool to map databases to the semantic layer using a specialized ontology
- Form based query interface for end users



Courtesy of Huajun Chen, Zhejiang University, ([SWEQ Case Study](#))