



1. Introduction

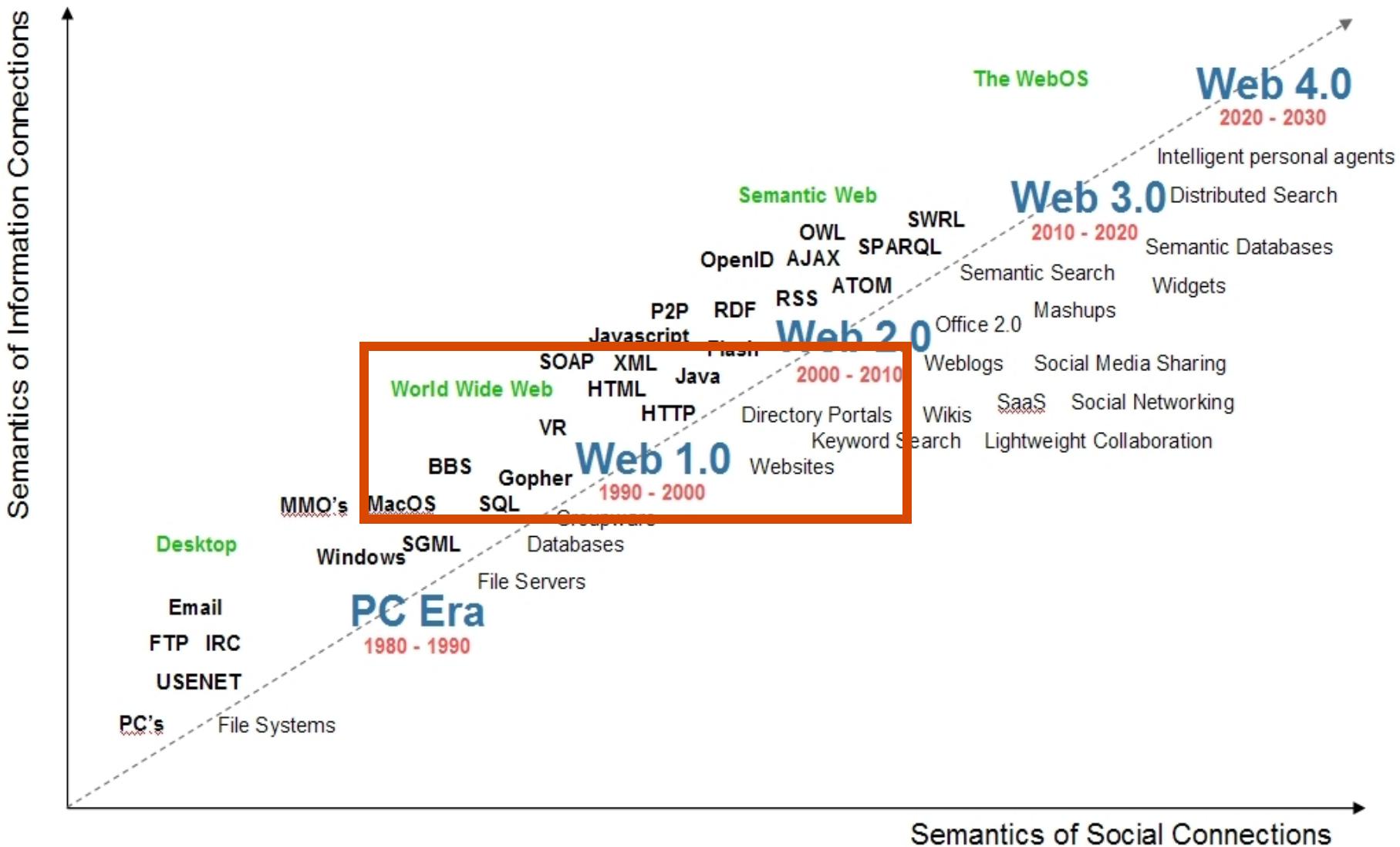
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<http://www.oeg-upm.net>

Omtological Engineering Group
Laboratorio de Inteligencia Artificial
Facultad de Informática
Universidad Politécnica de Madrid
Campus de Montegancedo sn,
28660 Boadilla del Monte, Madrid, Spain

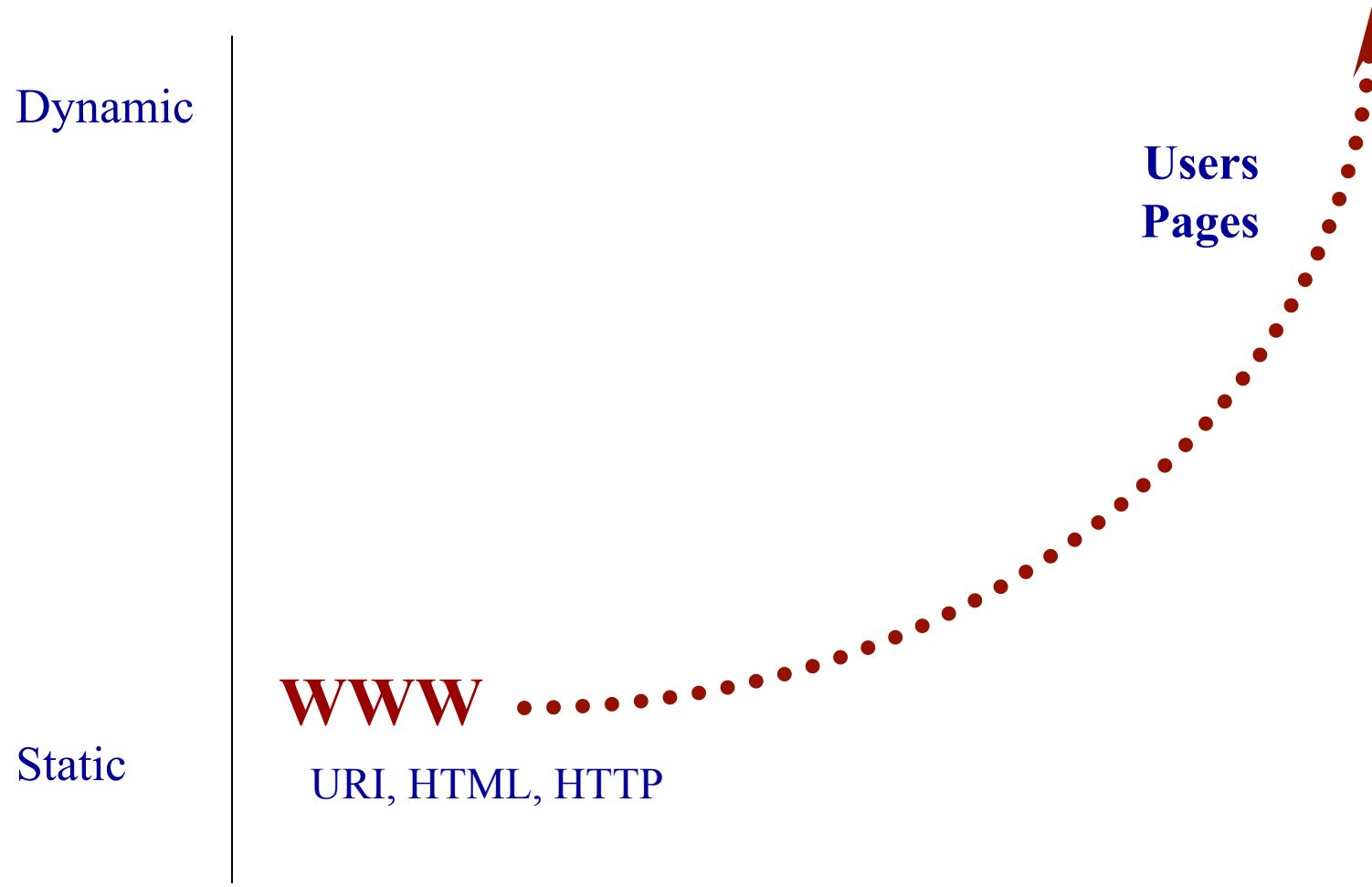
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- Web
- Web 2.0
- Web 3.0 and the Semantic Web
- Linked data
- Examples of semantic applications
 - Semantic Webs
 - Corporative Semantics
 - Annotation at large scale
 - Semantic portals
 - Semantic Web Services

Web n+1: Roadmap

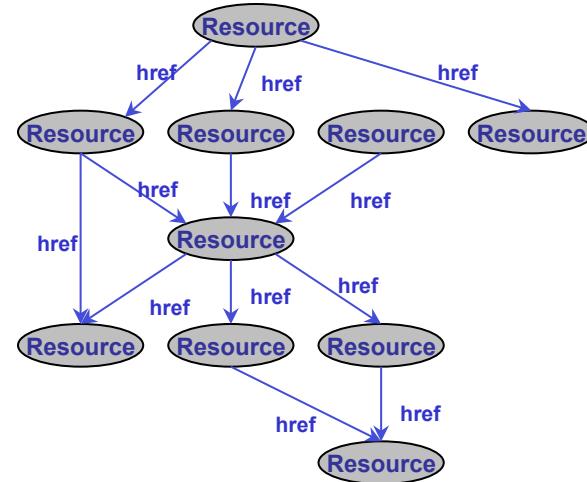


The problem: Information overload on the WEb



Where we are Today: the *Syntactic* Web

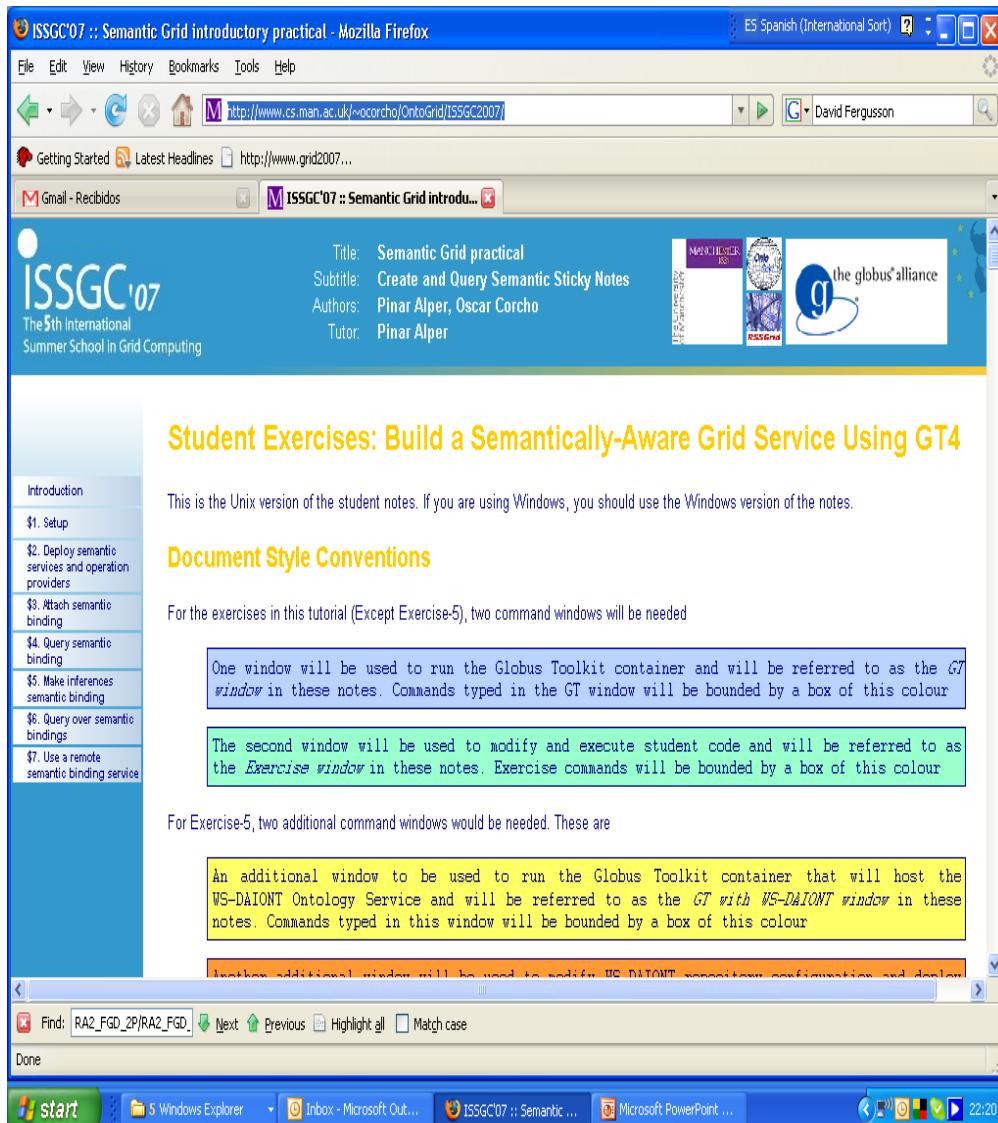
The screenshots illustrate the current state of the web, characterized by a focus on presentation and manual linking. The top screenshot shows a general view of the summer school's schedule, while the bottom screenshot provides a detailed look at a specific session's content.



- A place where computers do the presentation (easy) and people do the linking and interpreting (hard).
- Why not get computers to do more of the hard work?

What's the Problem?

- Typical web page markup consists of:
 - Rendering information (e.g., font size and colour)
 - Hyper-links to related content
- Semantic content is accessible to humans but not (easily) to computers...





المنسقة فی علم التطور :**الاسم**
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السعر : \$74.95
الكتاب : المنتج

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Skjøte: Ontological Ingeniørarbeid
Forfatter: Overtakelse Gómez-Pérez...
Pris: 74.95€
Produkt: Bok

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- HTML is useful for browsing the information
- Content is language-dependent
- High cost for keeping the information up-to-date



タイトル: 存在論工学
著者: アスンシオン ゴメスペレス
価格: \$74.95
产品: 本

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Title: Ontological Engineering
Authors: Asunción Gómez-Pérez...
Price: \$74.95
Product: Book

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Price: \$74.95
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Information a machine can see...

XML allows the creation of metadata with “meaning”



Árabe



المنسقة في علم التطوير : الاسم
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<الاسم><المنسقة في علم التطوير>/<الاسم>
<المؤلفون><آسنسيون غوميز بيريز>/<المؤلفون>
<السعر>\$74.95</السعر>
<الكتاب><المنتج>/<الكتاب>

Inglés



Title: Ontological Engineering
Authors: Asunción Gómez-Pérez...
Price: \$74.95
Product: Book

<Title>Ontological Engineering</Title>
<Author>Asunción Gómez-Pérez...</Author>
<Price>\$74.95</Price>
<Product>Book</Product>

¿What do the tags mean for the machine?



But What About...?

The problem of choosing information

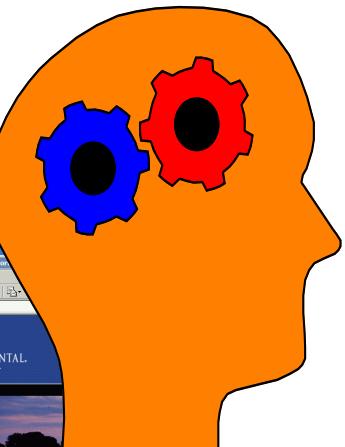
The collage illustrates the complexity of information choice through various web pages:

- Google Search Results:** Shows search results for "nemo" including links to IMDb and Amazon.
- Amazon.com Product Page:** Details the DVD for "Finding Nemo (2003)" at \$17.99 with a 40% discount.
- NEMO Website:** A custom site for a school visit featuring a cartoon Nemo character.
- NEMO Stellar Dynamics Toolbox:** A NASA page related to the NEMO project.
- Boston Music Awards:** A page for the "PRISING" conference.
- Bottom Navigation Bar:** Includes links like 'Categoría: Cine', 'www.runtime.com', and 'Search'.

- Find the information
- Extract relevant information
- Interpretation by human users
- Synthesis



The problem of content aggregation: From Madrid to Tokyo



VIAJES IBERIA - Microsoft Internet Explorer

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← Atrás → Búsqueda Favoritos Multimedia

Dirección <http://www.viajesiberia.com/>

VIAJES IBERIA

Personalizada para el origen MADRID | Inicio | Perfil | Reservas/presupuestor

Atención al cliente
902 116 221
¿Quieres ser informado?

Vuelos Madrid, España - Frankfurt, Alemania Sábado, 17 de Enero 2004

Vuelos desde Barajas (MAD), Madrid, España a Frankfurt Int'l (FRA), Frankfurt, Alemania

Ha seleccionado Turista

LEYENDA: OP=Vuelo operado por otra compañía, R=Solicitud en curso E=Candidato para billete electrónico

Seleccionar	Vuelo	Salida	Llegada	Escalas	Duración	Clase	
<input checked="" type="radio"/>	Lufthansa LH 4417 E	Barajas (MAD), Madrid, España	06:20	Frankfurt Int'l (FRA), Frankfurt, Alemania	09:05	Sin escalas 320	2h45min Turista
<input type="radio"/>	Spanair JK 8863 OP	Barajas (MAD), Madrid, España	06:20	Frankfurt Int'l (FRA), Frankfurt, Alemania	09:05	Sin escalas 320	2h45min Turista
<input type="radio"/>	Iberia IB 3500 E	Barajas (MAD), Madrid, España	09:00	Frankfurt Int'l (FRA), Frankfurt, Alemania	11:40	Sin escalas 320	2h40min Turista
<input type="radio"/>	Spanair JK 125	Barajas (MAD), Madrid, España	09:45	Frankfurt Int'l (FRA), Frankfurt, Alemania	12:35	Sin escalas 320	2h50min Turista
<input type="radio"/>	Lufthansa LH 2581 OP	Barajas (MAD), Madrid, España	09:45	Frankfurt Int'l (FRA), Frankfurt, Alemania			
<input type="radio"/>	Iberia IB 3514 E	Barajas (MAD), Madrid, España	11:30	Frankfurt Int'l (FRA), Frankfurt, Alemania			
<input type="radio"/>	Lufthansa LH 2582 OP	Barajas (MAD), Madrid, España	12:40	Frankfurt Int'l (FRA), Frankfurt, Alemania			

- Content in different formats

- Find out relevant information

The screenshot shows a Microsoft Internet Explorer window with two tabs open. The left tab displays the homepage of '東京全日空ホテル' (Tokyo All Japan Hotel) with a large image of a skyscraper and various service links like 'Fair & Event', 'Stay Plan', and 'Mall'. The right tab shows the homepage of the 'Frankfurt Hotel InterContinental Frankfurt - Microsoft Internet Explorer'. It features a large image of an airplane, the hotel's name, and a 'QUICK RESERVATIONS' form. Below the reservation form is a 'Check Availability' button. The page also includes sections for 'Hotel Reserve Page', 'Rooms & Apartments', 'Lage', 'Zimmerinformation', 'Essen & Unterhaltung', and 'Konditorei & Cafeteria'. A sidebar on the right lists 'Press Release', 'Rooms', and 'Recruit'.

- .- Content in different languages (Spanish, English, Japanese,...)
 - .- Find out relevant information from heterogeneous sources
 - .- Extract
 - .- Interpretation
 - .- Aggregation
 - .- Consistency of the information

- Interpretation

- Aggregation

- Consistency of the

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Webscraper

	Buchen	Gruppe und Module	Hochzeiten	Mittwochen	Nebensaison
	Juli	Sep	Apr-Juni	Sept	Nov
ECM - ECONOMY 3	106	244,98 €	244,98 €	244,98 €	244,98 €
1.1 alle abholen					
COM: COMFORT 5	106	314,97 €	314,97 €	314,97 €	314,97 €
1.1 alle abholen					
IDMR: MITTELKOMFORT	106	384,97 €	384,97 €	384,97 €	384,97 €
MANUE: OPEL VECTRA					

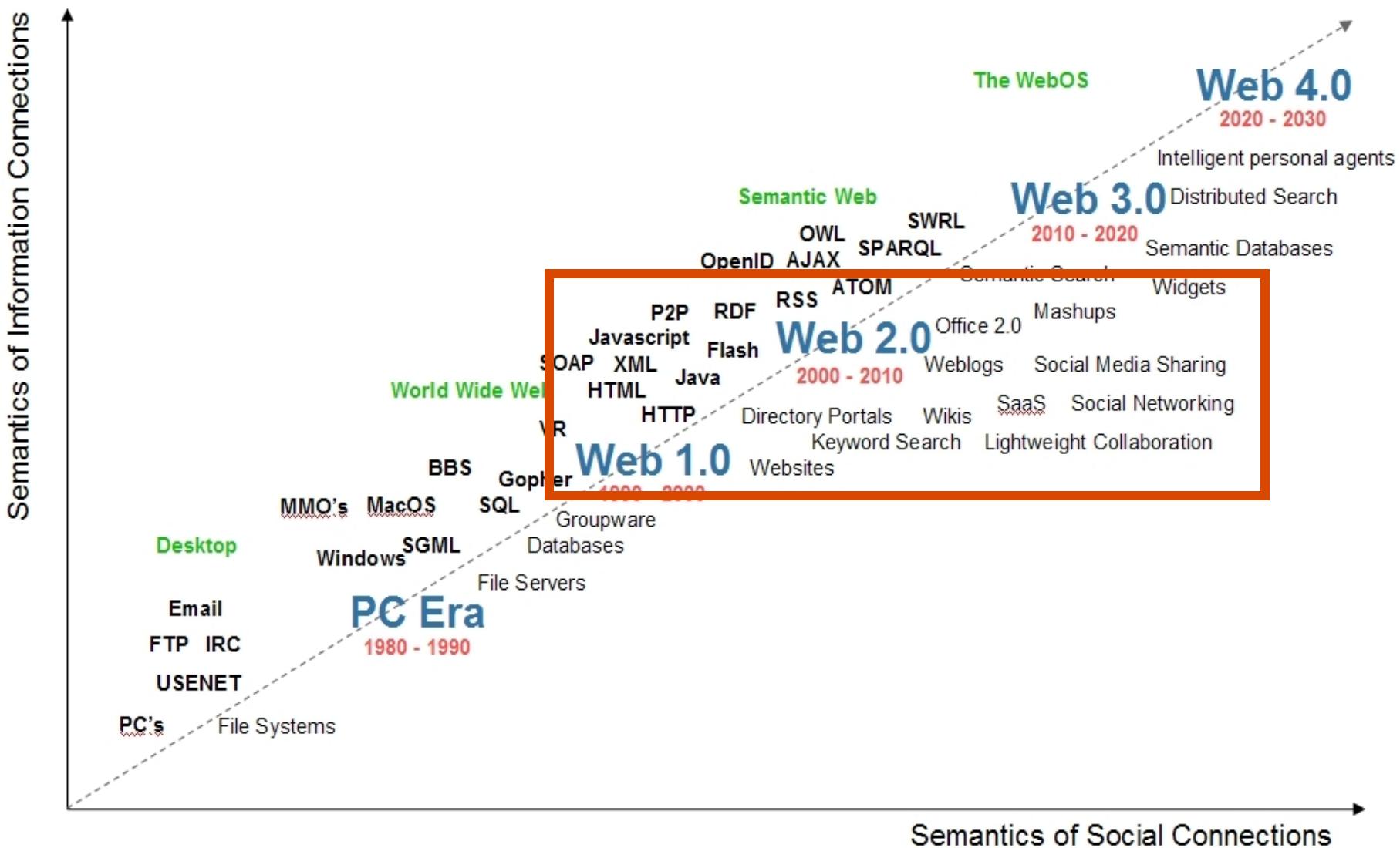
What was the Web intended to be?



“... a goal of the Web was that, if the interaction between person and hypertext could be so intuitive that the machine-readable information space gave an accurate representation of the state of people's thoughts, interactions, and work patterns, then machine analysis could become a very powerful management tool, seeing patterns in our work and facilitating our working together through the typical problems which beset the management of large organizations.”

[Berners-Lee 1996]

Web n+1: Roadmap

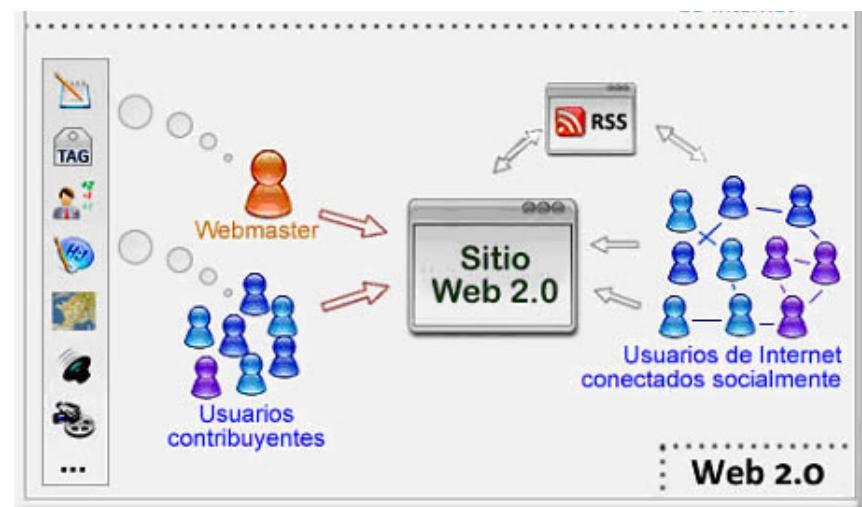


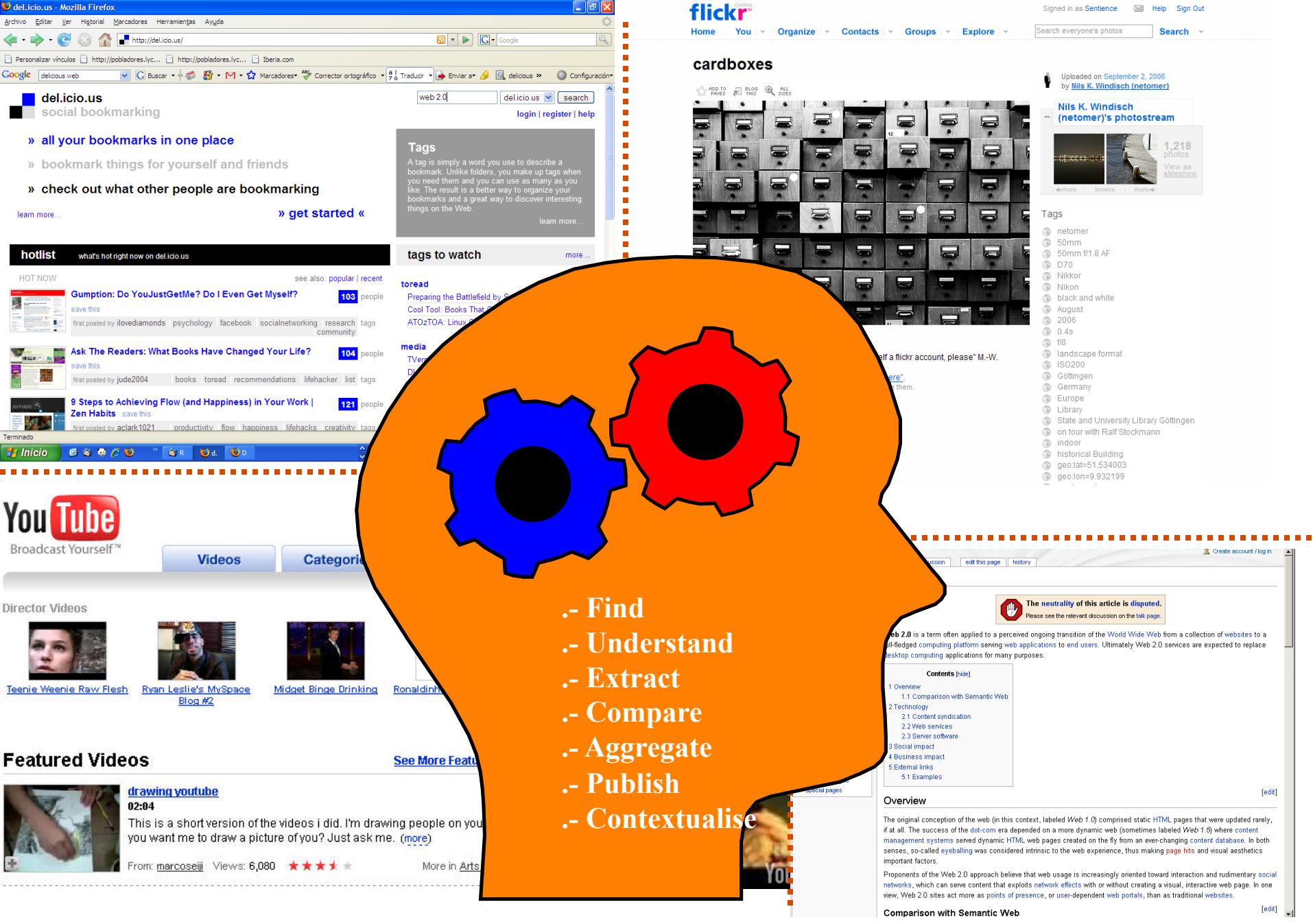
SOME RIGHTS RESERVED

Source: Radar Networks & Nova Spivack, 2007 – www.radarnetworks.com

Web 2.0

- **Users are both readers and writers**
 - Generate content
 - Control content
- **Ever-increasing amounts of content**
 - Dynamic content
- **Users participate**
 - Communication
 - Collaboration
- **Users add value to applications as they use it**
 - Collective intelligence by way of user participation
- **Rich user experience**
 - User-friendly interface
 - Personalized content
- **The Web as a programming platform**
 - Run applications entirely through a browser
 - Portability: software above the level of a single device
 - Openness



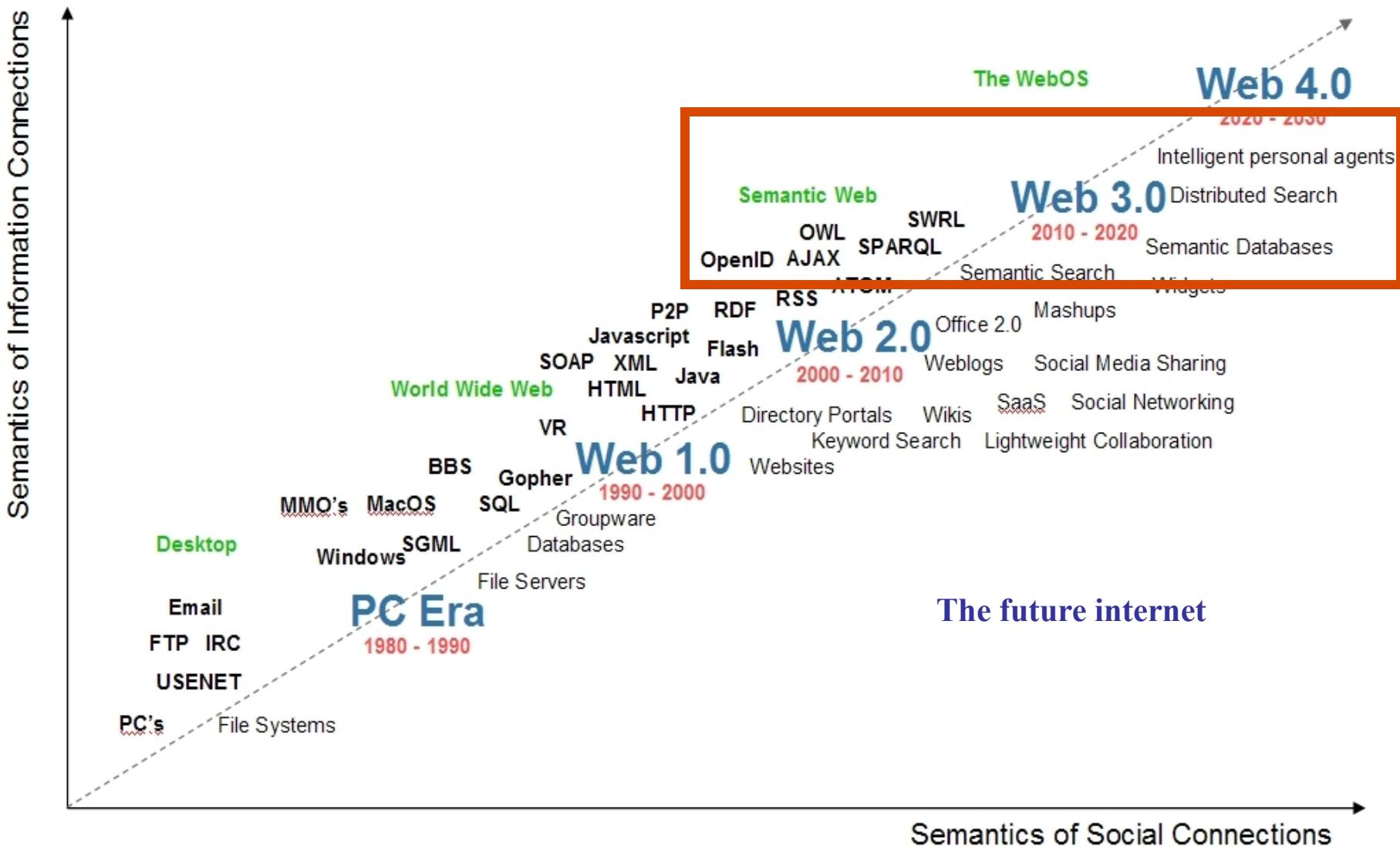


and Tim Berner-Lee [1996] sentence
is still valid for the Web 2.0



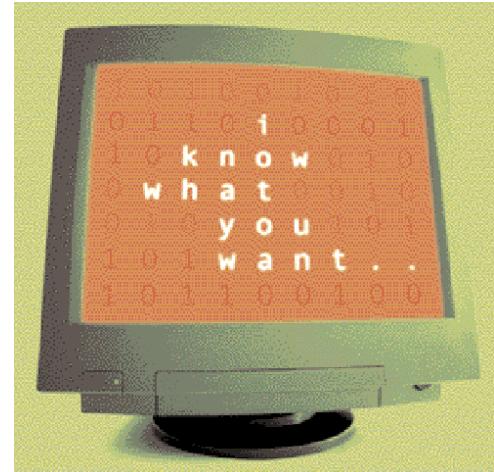
“... the machine-readable information space ...
... machine analysis could become a very
powerful management tool, ...
... facilitating our working together”

Web n+1: Roadmap



Web 3.0

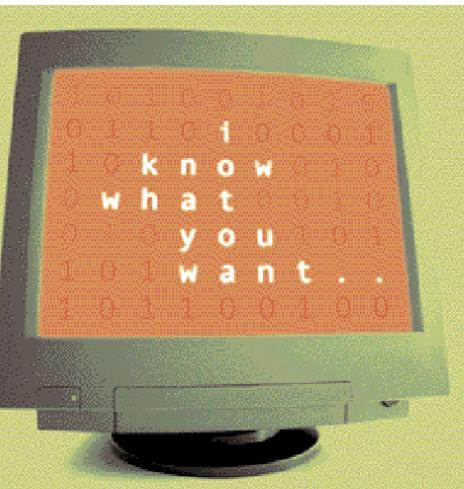
- **Intelligent Web**
 - Semantic Web technologies
 - The Data Web – a global database
 - Intelligent applications (NLP, machine learning, machine reasoning, autonomous agents)
- **Ubiquitous**
 - Broadband adoption
 - Mobile Internet access
 - Mobile devices
- **Cloud computing**
 - Software-as-a-service business models
 - Web services interoperability
 - Distributed computing (P2P, grid computing, hosted "cloud computing" server farms)
- **Openness**
 - Open APIs and protocols
 - Open data formats
 - Open-source software platforms
 - Open data (Creative Commons, Open Data License, etc.)
- **Open Identity**
 - Open identity (OpenID)
 - Open reputation
 - Portable identity and personal data



<http://lifeboat.com/ex/web.3.0>

What is the Semantic Web?

“The Semantic Web is an **extension** of the current Web in which information is given **well-defined meaning**, better enabling computers and people to work in **cooperation**. It is based on the idea of having data on the Web defined and linked such that it can be used for more **effective discovery, automation, integration, and reuse across various applications.**”



Ontologies

Anotation

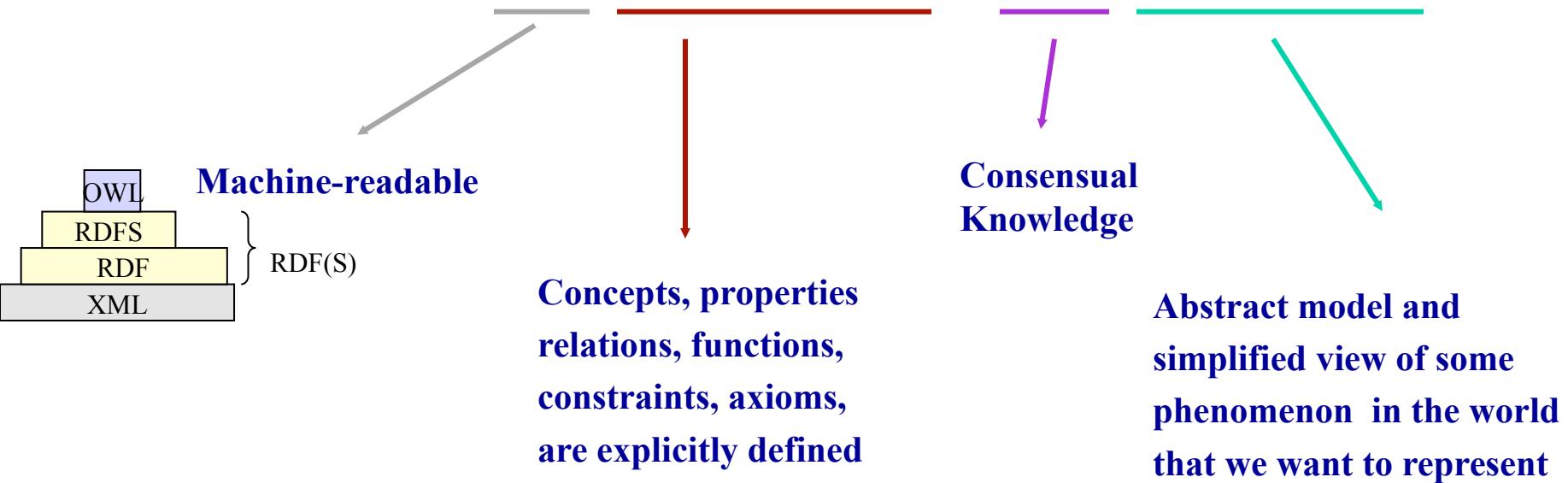
Hendler, J., Berners-Lee, T., and Miller, E.
Integrating Applications on the Semantic Web, 2002,
<http://www.w3.org/2002/07/swint.html>

Need to Add “Semantics”

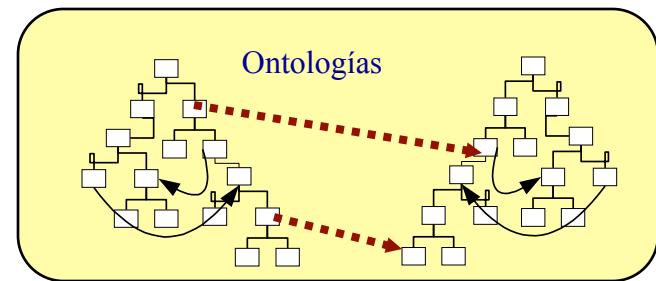
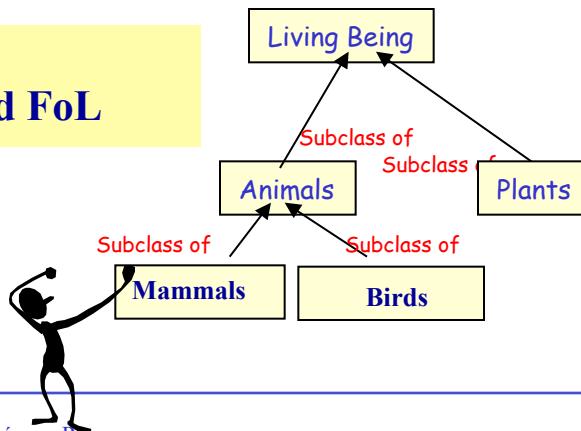
- External agreement on meaning of annotations
 - E.g., *Dublin Core* for annotation of library/bibliographic information
 - Agree on the meaning of a set of annotation tags
 - Problems with this approach
 - Inflexible
 - Limited number of things can be expressed
- Use Ontologies to specify meaning of annotations
 - Ontologies provide a vocabulary of terms
 - New terms can be formed by combining existing ones
 - “Conceptual Lego”
 - Meaning (semantics) of such terms is formally specified
 - Can also specify relationships between terms in multiple ontologies

Definition of Ontology

“An ontology is a formal, explicit specification of a **shared conceptualization**”



Frames and FoL



Ontology

VIAJES IBERIA

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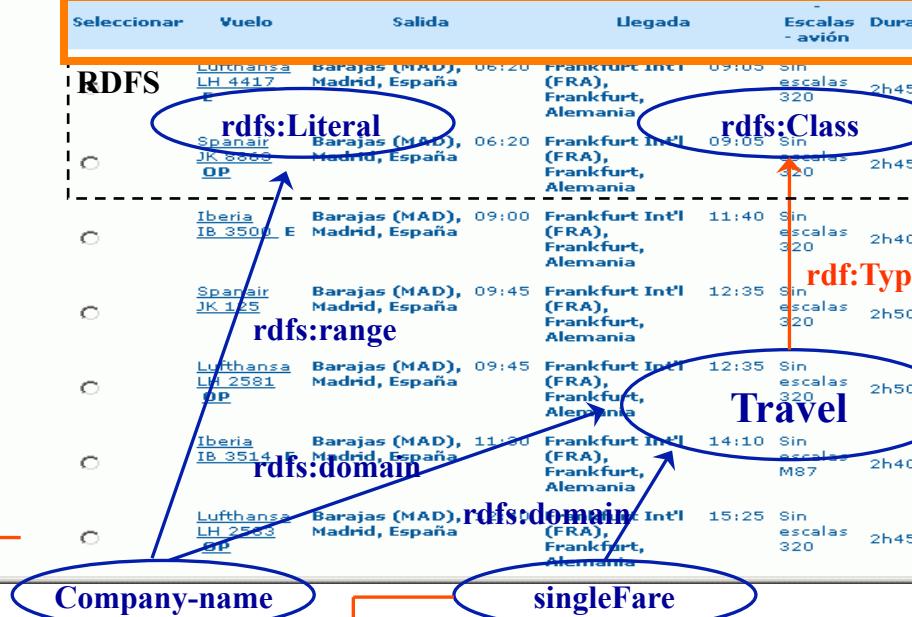
Vuelos: Madrid, España - Frankfurt, Alemania Sábado, 17 de

Vuelos desde Barajas (MAD), Madrid, España a Frankfurt Int'l (FRA), Frankfurt, Alemania

Ha seleccionado Turista

LEYENDA: OP=Vuelo operado por otra compañía, R=Solicitud en curso E=Candidato para electrónico

Seleccionar	Vuelo	Salida	Llegada	Escalas - avión	Dura-
RDFS	Lufthansa LH 4417 Barajas (MAD), Madrid, España	06:20	Frankfurt Int'l (FRA), Frankfurt, Alemania	09:05 Sin escalas 320	2h45
	Spanair JK 8866 Barajas (MAD), Madrid, España	06:20	Frankfurt Int'l (FRA), Frankfurt, Alemania	09:05 Sin escalas 320	2h45
	Iberia IB 3500 E Barajas (MAD), Madrid, España	09:00	Frankfurt Int'l (FRA), Frankfurt, Alemania	11:40 Sin escalas 320	2h40
	Spanair JK 125 Barajas (MAD), Madrid, España	09:45	Frankfurt Int'l (FRA), Frankfurt, Alemania	12:35 Sin escalas 320	2h50
	Lufthansa LH 2581 OP Barajas (MAD), Madrid, España	09:45	Frankfurt Int'l (FRA), Frankfurt, Alemania	12:35 Sin escalas 320	2h50min
	Iberia IB 3514 E Barajas (MAD), Madrid, España	11:00	Frankfurt Int'l (FRA), Frankfurt, Alemania	14:10 Sin escalas M87	2h40min
	Lufthansa LH 2583 OP Barajas (MAD), Madrid, España	11:00	Frankfurt Int'l (FRA), Frankfurt, Alemania	15:25 Sin escalas 320	2h45min



```

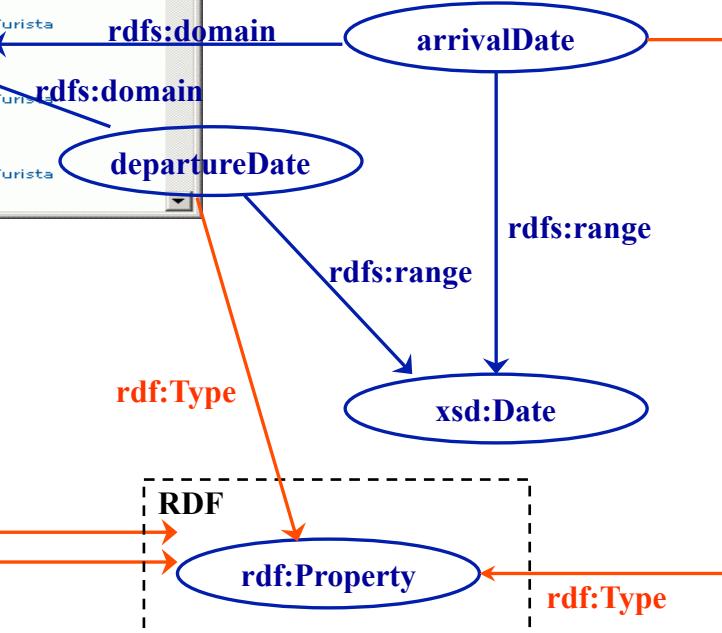
    rdfs:Class rdf:ID="Travel">
    <rdfs:comment>A journey from place to
    place</rdfs:comment>
    </rdfs:Class>
  
```

```

    <rdf:Property rdf:ID="arrivalDate">
    <rdfs:domain rdf:resource="#Travel"/>
    <rdfs:range rdf:resource="&xsd;date"/>
    </rdf:Property>
  
```

```

    <rdf:Property rdf:ID="departureDate">
    <rdfs:domain rdf:resource="#Travel"/>
    <rdfs:range rdf:resource="&xsd;date"/>
    </rdf:Property>
  
```



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Seleccionar	Vuelo	Salida	Llegada	Escalas avión	Duración	Clase
<input checked="" type="radio"/>	Lufthansa LH 4417 E	Barajas (MAD), Madrid, España	06:20	Frankfurt Int'l (FRA), Frankfurt, Alemania	09:05	Sin escalas 320 2h45min Turista
<input type="radio"/>	Spanair JK 8863 OP	Barajas (MAD), Madrid, España	06:20	Frankfurt Int'l (FRA), Frankfurt, Alemania	09:06	Sin escalas 320 2h45min Turista
<input type="radio"/>	Iberia IB 3500 E	Barajas (MAD), Madrid, España	09:00	Frankfurt Int'l (FRA), Frankfurt, Alemania	11:40	Sin escalas 320 2h40min Turista
<input type="radio"/>	Spanair JK 1225	Barajas (MAD), Madrid, España	09:45	Frankfurt Int'l (FRA), Frankfurt, Alemania	12:35	Sin escalas 320 2h50min Turista
<input type="radio"/>	Lufthansa LH 2581 OP	Barajas (MAD), Madrid, España	09:45	Frankfurt Int'l (FRA), Frankfurt, Alemania	12:35	Sin escalas 320 2h50min Turista
<input type="radio"/>	Iberia IB 3514 E	Barajas (MAD), Madrid, España	11:30	Frankfurt Int'l (FRA), Frankfurt, Alemania	14:10	Sin escalas M87 2h40min Turista
<input type="radio"/>	Lufthansa LH 2583 OP	Barajas (MAD), Madrid, España	12:40	Frankfurt Int'l (FRA), Frankfurt, Alemania	15:25	Sin escalas 320 2h45min Turista

Metadata

Company-name

IB-4321

singleFare

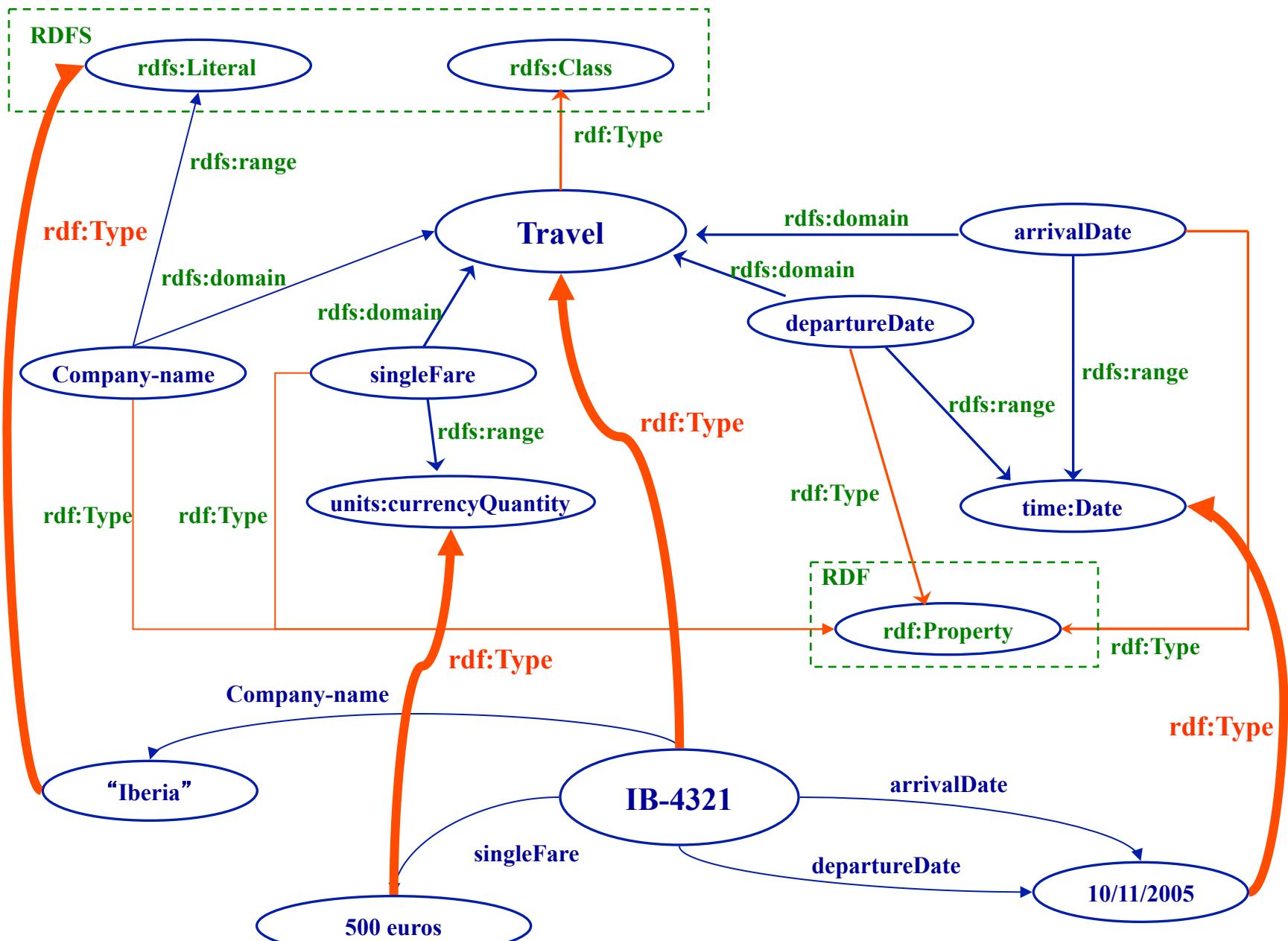
departureDate

arrivalDate

10/11/2005

```

<Travel rdf:ID="IB-4321">
  <Company-name>Iberia</Company-name>
  <singleFare>500 Euros</singleFare>
  <departureDate rdf:datatype="&xsd;date">
    2005-11-10
  </departureDate>
  <arrivalDate rdf:datatype="&xsd;date">
    2005-11-10
  </arrivalDate>
  <arrivalPlace rdf:resource="#Paris"/>
</Travel>
```



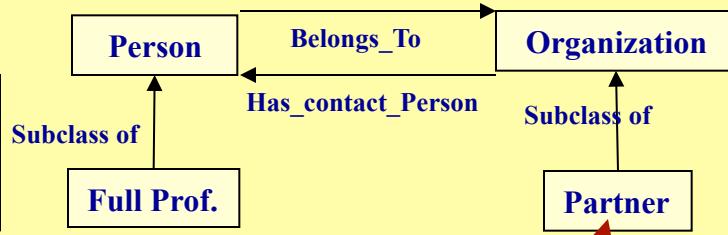
Ontologies and Metadata

Ontologies

```

xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#'
xmlns:NS0='http://www.esperonto.net/semanticportal/RDFS/Person_Ontology#'
xmlns:NS1='http://www.esperonto.net/semanticportal/RDFS/Organization_Ontology#'

```



Instance of

Instance of

```

<rdf:Description rdf:about='Asunción Gómez-Pérez'>
<rdf:type rdf:resource='Full Prof' />
<NS0:Full_Name>A. GomezPerez</NS0:Full_Name>
<NS0:Belongs_To>UPM</NS0:Belongs_To>
<NS0:e-mail>asun@fi.upm.es</NS0:e-mail>

```

```

<rdf:Description rdf:about='UPM'>
<rdf:type rdf:resource='Partner' />
<NS1:Acronym>UPM</NS1:Acronym>
<NS1:Has_Contact_Person>Asunción Gómez-Pérez
</NS1:Has_Contact_Person>

```

Full Name	Asuncion Gomez-Perez
e-mail	asun@fi.upm.es
Photo	

Asunción Gómez-Pérez is contact person [UPM](#) (Partner).
Asunción Gómez-Pérez belongs to [UPM](#) (Partner).

Full Name	Universidad Politécnica de Madrid
Acronym	UPM
Logo	

UPM has contact person [Asunción Gómez-Pérez](#) (Associate Professor).
UPM participates in [Esperonto](#) (Project).
IIPM team is formed by :

Annotation (RDF)

Web Page

URL

<http://www.esperonto.net>

<http://www.esperonto.net>



Why not make the computers do the work?

IBXX is a flight. Its departure place is Madrid and its arrival place is Tokyo.
Madrid is an european city. Tokyo is an asian city.

The image shows four separate windows illustrating the integration of metadata and knowledge inference:

- Flight Information:** A screenshot of a travel search interface showing flight options from Madrid (Barajas) to Tokyo (Haneda) via Frankfurt. It includes departure times, arrival times, layover locations, and class information.
- Hotel Listings:** A screenshot of a hotel booking website showing results for "Bridal Fair 2004" in Tokyo. It lists various hotel names and descriptions.
- Car Rental Information:** A screenshot of a car rental website for "Hertz" in Tokyo. It shows car models, prices, and rental terms.
- Theater Information:** A screenshot of the "NEW NATIONAL THEATRE, TOKYO Web Site". It features a photograph of the theater interior, a calendar of performances, and details about the venue's history and current events.

The new national theater is a theater located in Tokyo. It has performances every Saturday.

Xxx is a hotel placed in Tokyo

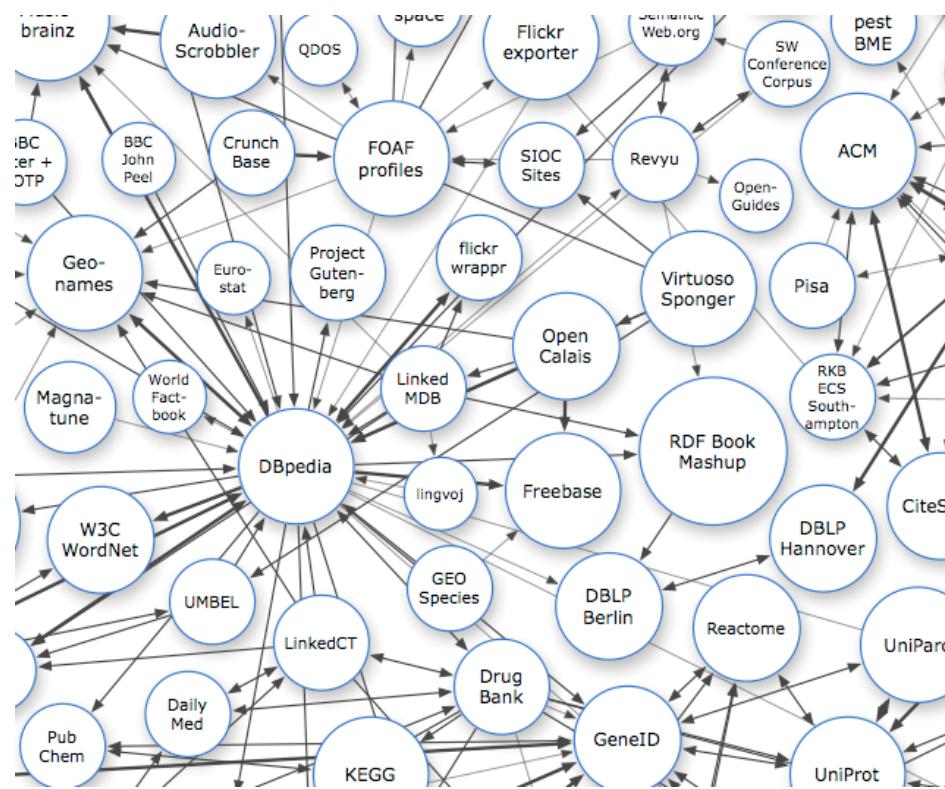
Herzt is a rental car company with luxury cars in tokyo.

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What is the Web of Linked Data?

- An extension of the current Web...
 - ... where **information** is **data** given **well-defined** and **explicitly represented meaning**, ...
 - ... so that it can be **shared** and used by **humans and machines**, ...
 - ... better enabling them to work in cooperation
- How?
 - Promoting information exchange by **tagging web content** with machine processable descriptions of its meaning.
 - And **technologies** and **infrastructure** to do this
 - And **clear principles** on how to publish data

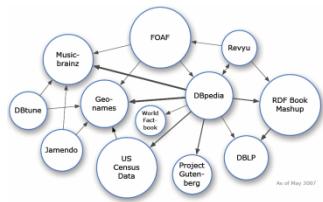


What is Linked Data?

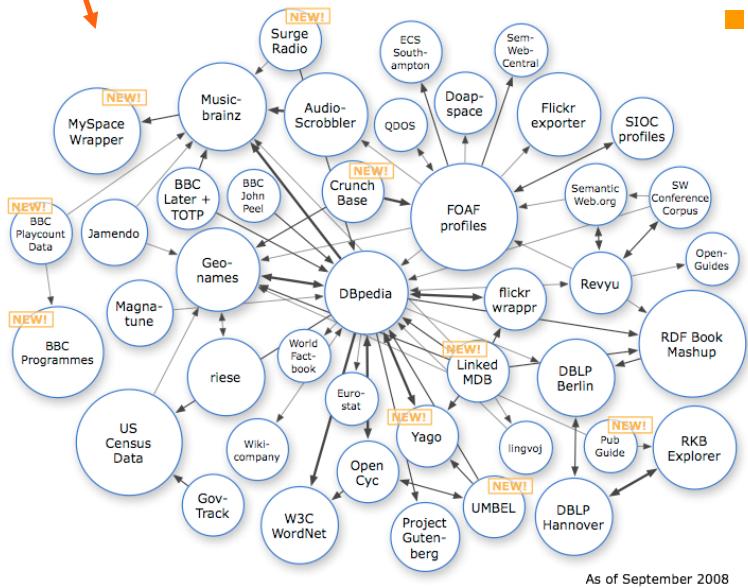
- Linked Data is a term used to describe a recommended **best practice** for exposing, sharing, and connecting pieces of data, information, and knowledge on the Semantic Web using URIs and RDF.
 - Part of the Semantic Web
 - Exposing, sharing and connecting data
 - Technologies: URIs and RDF (although others are also important)

Linked Open Data evolution

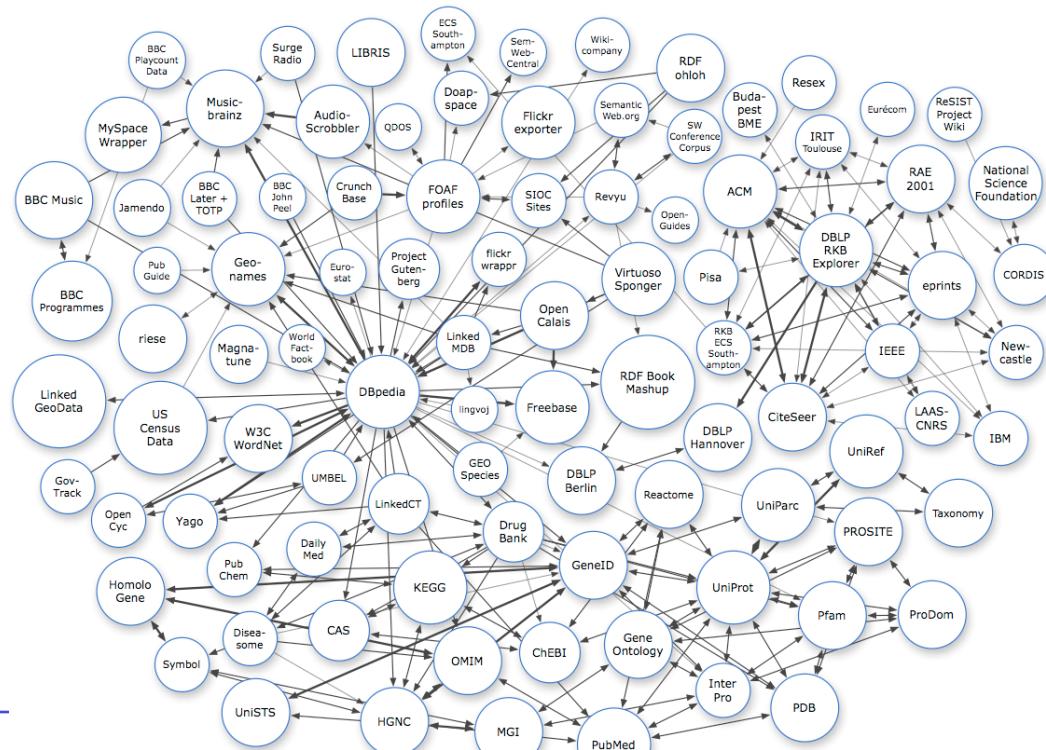
■ 2007



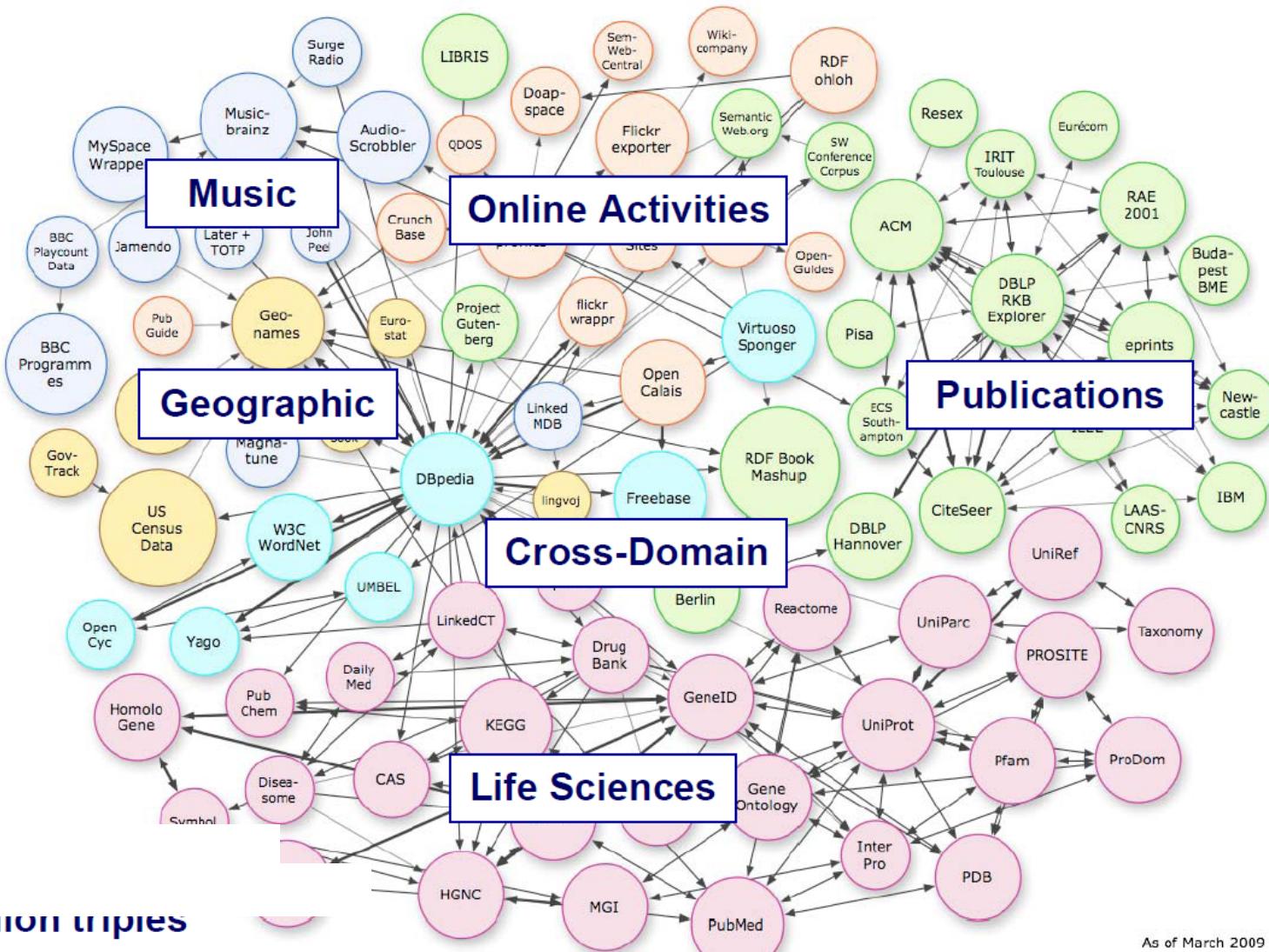
■ 2008



■ 2009



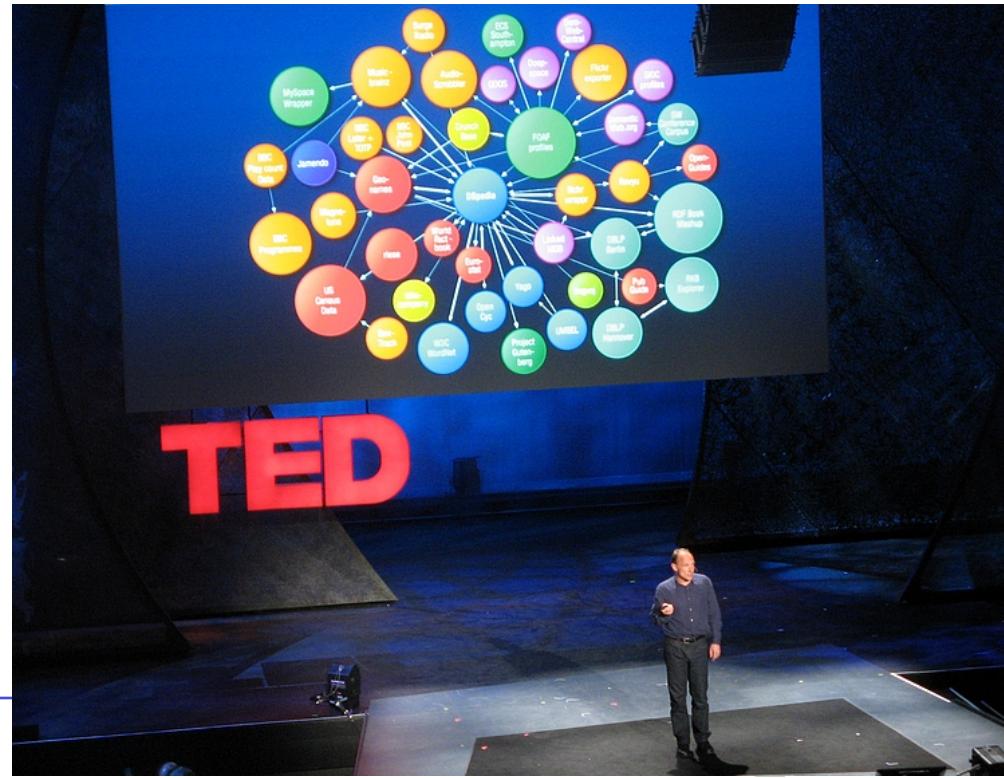
LOD clouds



The four principles (Tim Berners Lee, 2006)

http://www.ted.com/talks/tim_berners_lee_on_the_next_web.html

1. Use URIs as names for things
 2. Use HTTP URIs so that people can look up those names.
 3. When someone looks up a URI, provide useful information, using the standards (RDF*, SPARQL)
 4. Include links to other URIs, so that they can discover more things.
- <http://www.w3.org/DesignIssues/LinkedData.html>



Open Government. USA and UK

The image displays two screenshots of government data portals side-by-side. On the left is the UK GOV.UK website, featuring a blue header with the HM Government logo, a navigation bar with links like Home, Blog, Data, SPARQL, Apps, Ideas, Forum, Wiki, Resources, and About. Below the header is a section titled 'Unlocking innovation' with a sub-section 'Working with UK Public Sector Information and data'. A large blue 3D geometric icon is visible. To the right is the US DATA.GOV website, with a blue header featuring the DATA.GOV logo and navigation links for HOME, DATA, TOOLS, COMMUNITY, METRICS, and DIALOGUE. A banner on the DATA.GOV page celebrates its 'HAPPY 1ST ANNIVERSARY' with a picture of a cupcake. The right side of the DATA.GOV page includes sections for 'Most Popular Datasets' (with a list of five items), 'SEARCH OUR CATALOGS', and 'COMMUNITY' and 'SEMANTIC WEB' sections. Overlaid on the bottom of the image are two large, bold, black text blocks: 'TOP-DOWN' on the left and 'BOTTOM-UP' on the right, both set against a semi-transparent green rectangular background.

HM Government

Home Blog Data SPARQL Apps Ideas Forum Wiki Resources About

Unlocking innovation

Working with UK Public Sector Information and data

Latest datasets

2 July Public servants earning over £150,000 now also covers NDPBs

25 June Costs and other data about central government websites

18 June Estimated government workforce including consultants

14 June More COINS public spending data; now covers 2005 to 2010

What we do

data.gov.uk is a key part of the Government's Transparency programme for the UK public sector as a whole. Working with Sir Tim Berners-Lee, Professor Nigel Shadbolt and Tim Steinberg and other members of the Cabinet Office Minister's new Public Sector Transparency Board this site seeks to give a way into the wealth of government data becoming available. It's under constant development and we want to work with you to make it better.

Search

TOP-DOWN

DATA.GOV

HOME DATA TOOLS COMMUNITY METRICS DIALOGUE

HAPPY 1ST ANNIVERSARY

data.gov.uk

Subscribe by RSS

Community Log in / Sign up

Local Data Panel

What is the Semantic Web?

BOTTOM-UP

Most Popular Datasets

1. U.S. Overseas Loans and Grants (Greenbook)
2. Worldwide M1+ Earthquakes, Past 7 Days
3. Latest Volumes of Foreign Relations of the...
4. Local Area Unemployment Statistics
5. Personnel Trends by Gender/Race

SEARCH OUR CATALOGS

Search our catalogs... SEARCH

COMMUNITY

SEMANTIC WEB

As the Web of linked documents evolves to include the Web of linked data, we're working to maximize the potential of Semantic Web technologies to realize the promise of...

Ontology Engineering Group

Linked Data Mashup (data.gov)

Clean Air Status and Trends (CASTNET)

Clean Air Status and Trends Network (CASTNET)

Land Use	
27	Agric
1	Coastal/Marsh
3	Desert
40	Forest

Terrain	
37	Rolling
4	Mountaintop
1	Flat/Water
14	Flat

Agency	
59	EPA
25	NPS

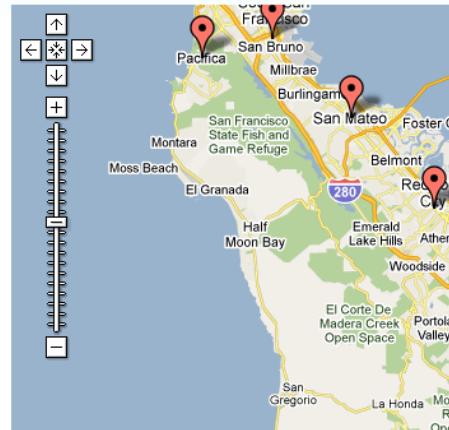
o-8-castnet.php



employment market explorer

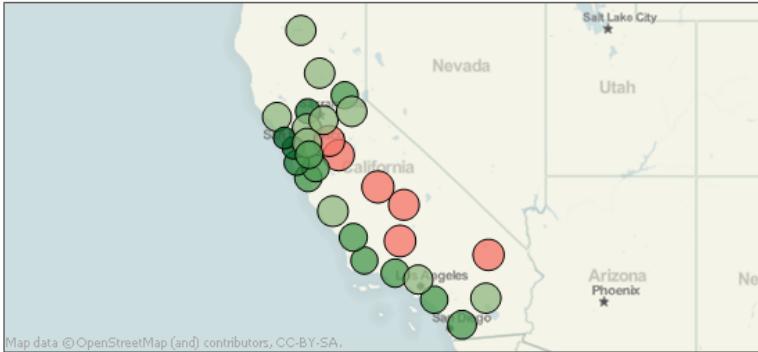
home

Employment Market explorer is tool designed to help people understand regional and state unemployment rates and analyze the labor market conditions.

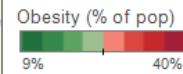
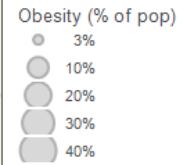


National obesity comparison tool

Obesity by county

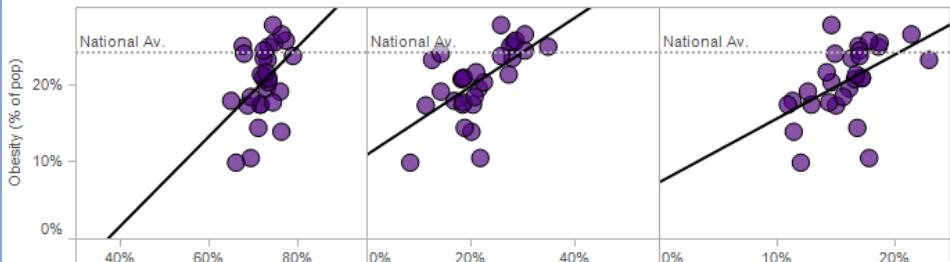


Select a state*:
California



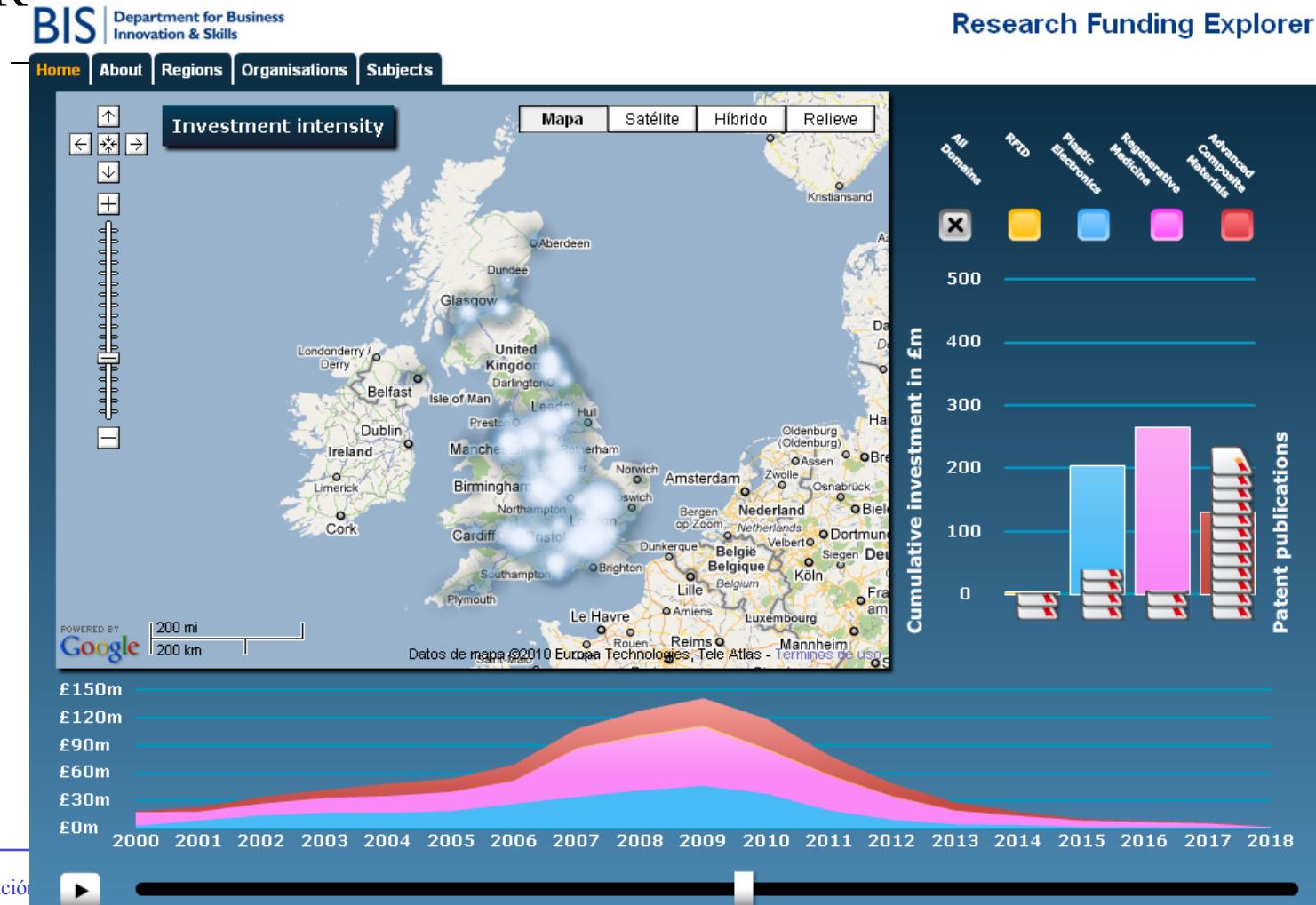
*Alaska and DC have no values for obesity and are thus excluded. Certain counties are also excluded for the same reason.

Select point(s) to view details in chart below:



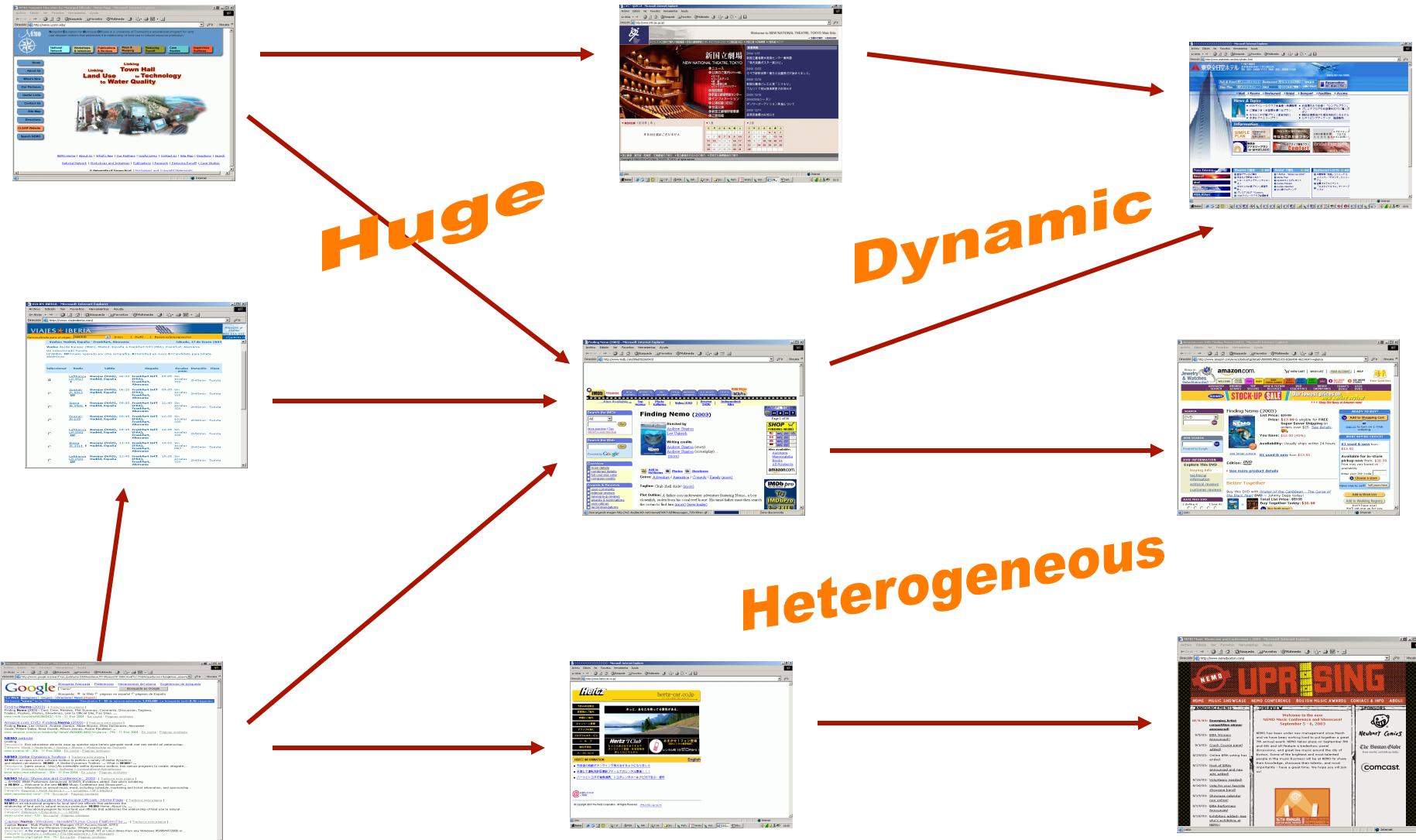
Linked Data Mashup (data.gov.uk)

- Research Funding Explorer

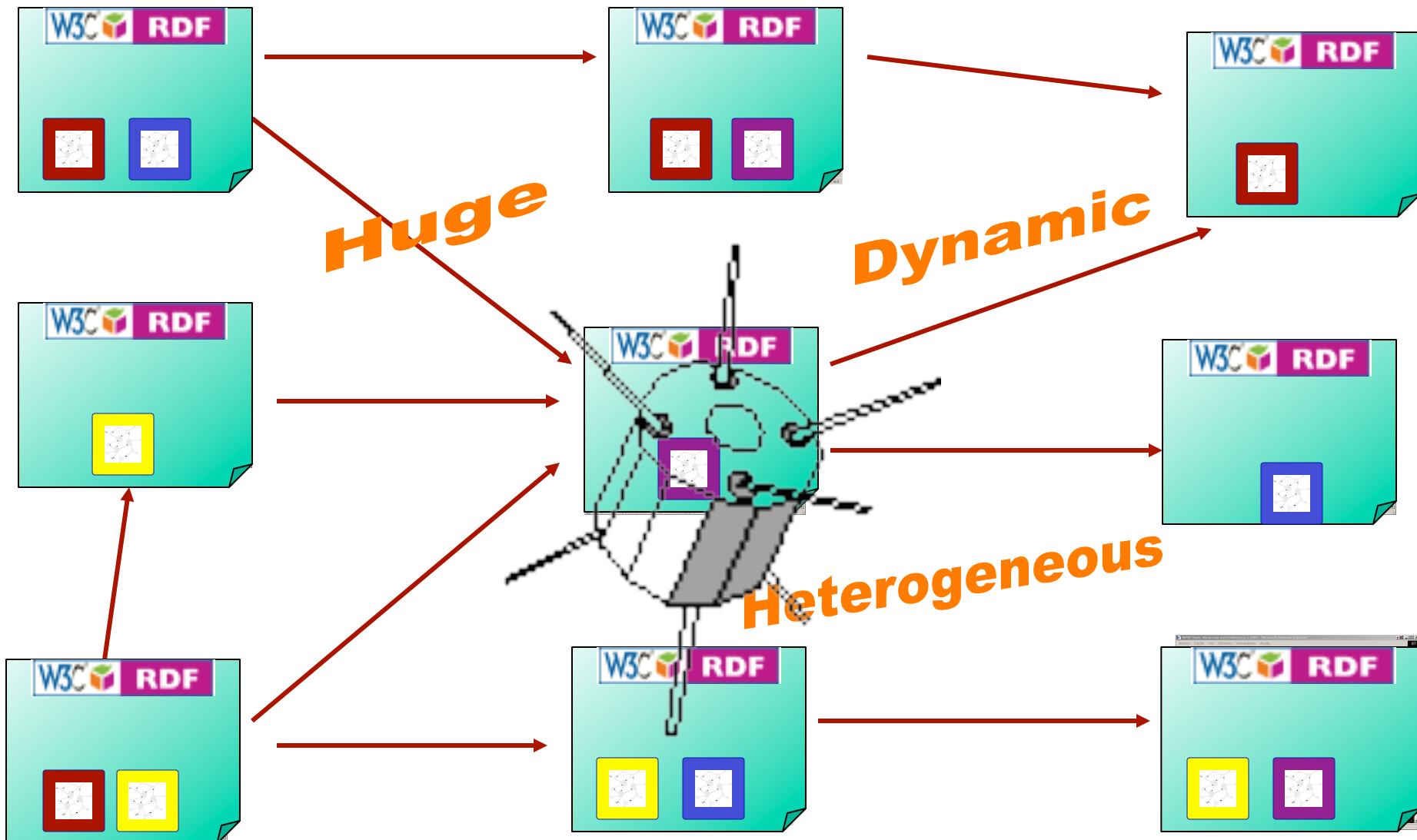


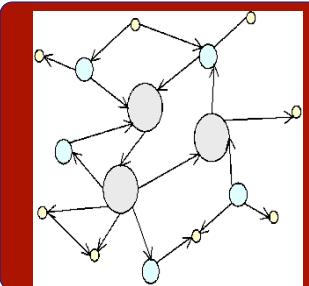
- Web
- Web 2.0
- Web 3.0 and the Semantic Web
- Examples of semantic applications
 - Semantic Webs
 - Corporative Semantics
 - Annotation at large scale
 - Semantic portals
 - Semantic Information exchange between heterogeneous data sources

The Web

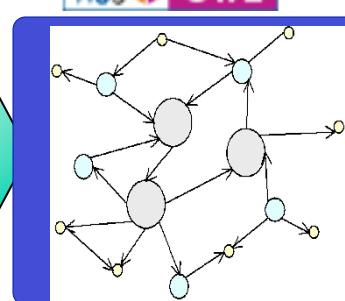
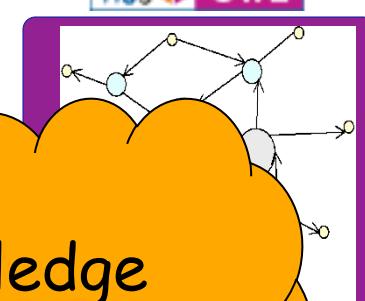
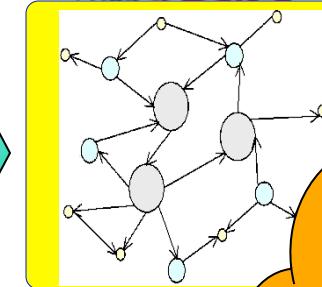


Semantic Webs





Alignments



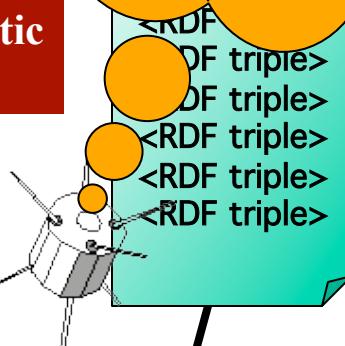
Ontologies

Knowledge Metadata Reasoning

Metadata

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The Semantic
web



W3C RDF

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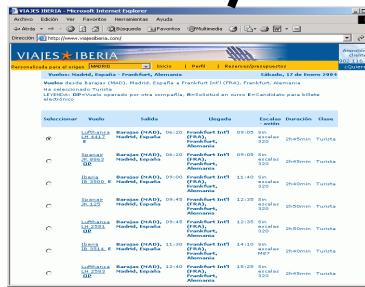
Information



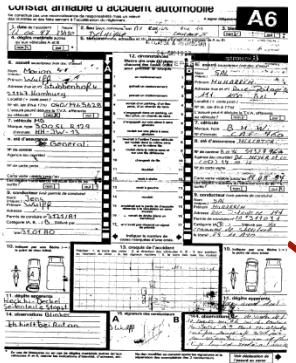
W3C RDF

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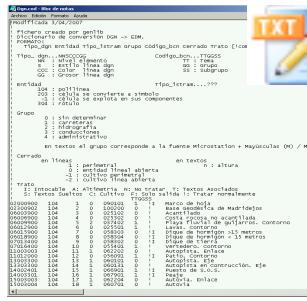
The web



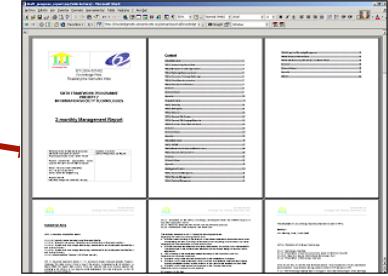
Corporative Semantics



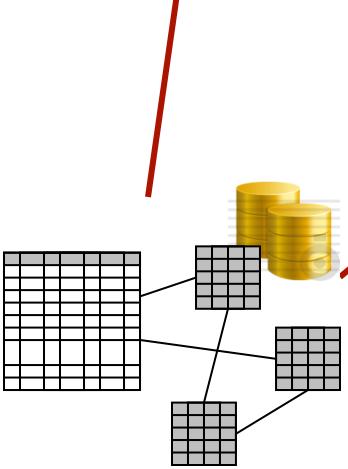
Huge



Dynamic



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814 PROFIT - Program 2	Empreses	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903)
802 PROFIT - Program 1	Associacions empresarials	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) SUBENCIÓNS <=
501 PROFIT - Program 1	Empreses, Agrupacions i entitats	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) SUBENCIÓNS <=
576 PROFIT - Program 1	Empreses, Empreses, Agrupacions i entitats	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) SUBENCIÓNS <=
574 PROFIT - Program 1	Empreses, Empreses, Agrupacions i entitats	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) SUBENCIÓNS <=
573 PROFIT - Program 1	Empreses	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) Els ajuts que es po
572 PROFIT - Program 1	Empreses	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) Els ajuts que es po
571 PROFIT - Program 1	Empreses, Empreses, Agrupacions i entitats	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) Els ajuts que es po
570 PROFIT - Program 1	Empreses, Empreses, Agrupacions i entitats	Agupa	Dos de 19 de novembre fins al 19 d'Ordre de 7 de març del 2000	(BOE 59, 903-2000) Els ajuts que es po



Heterogeneous

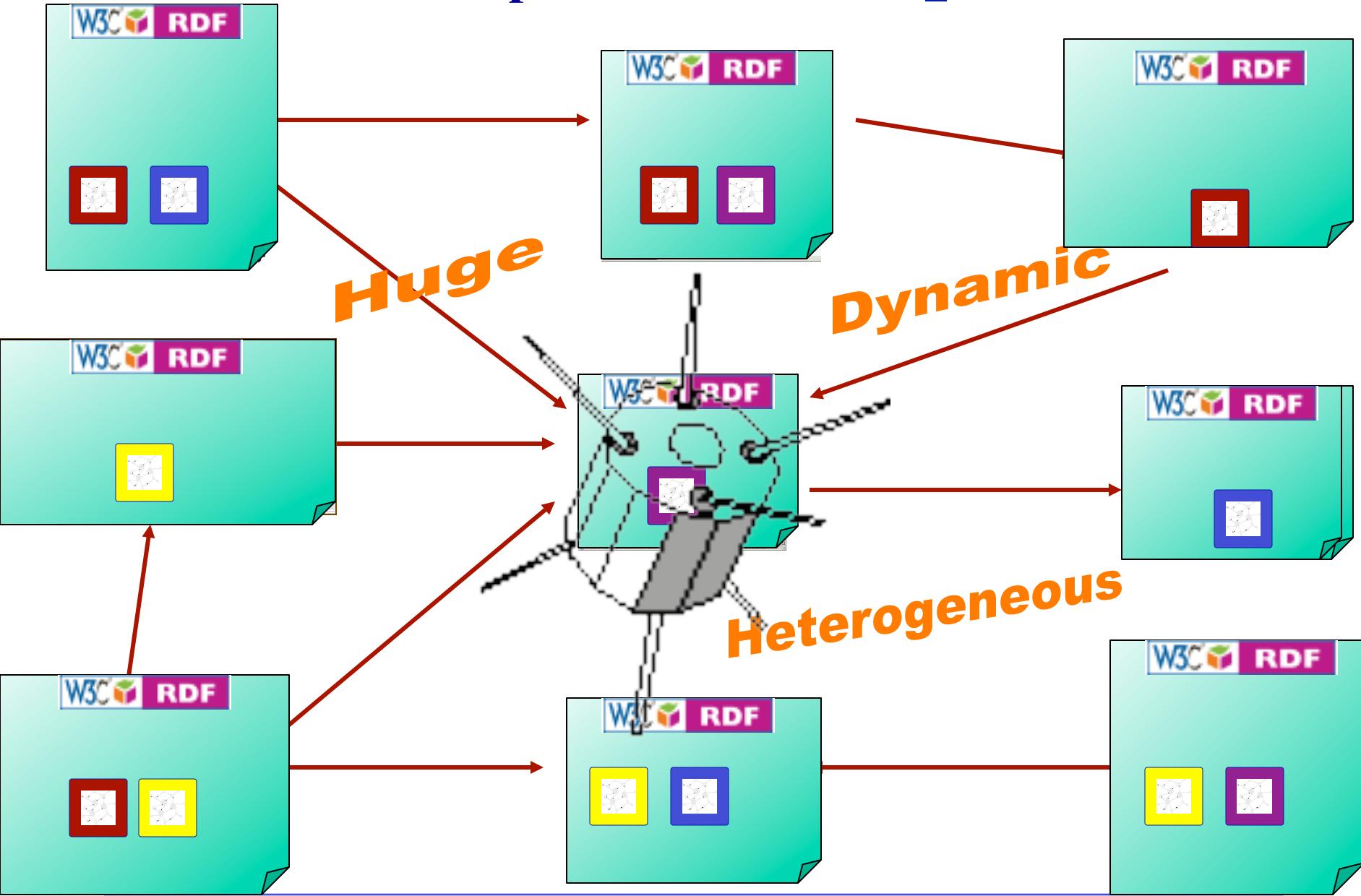


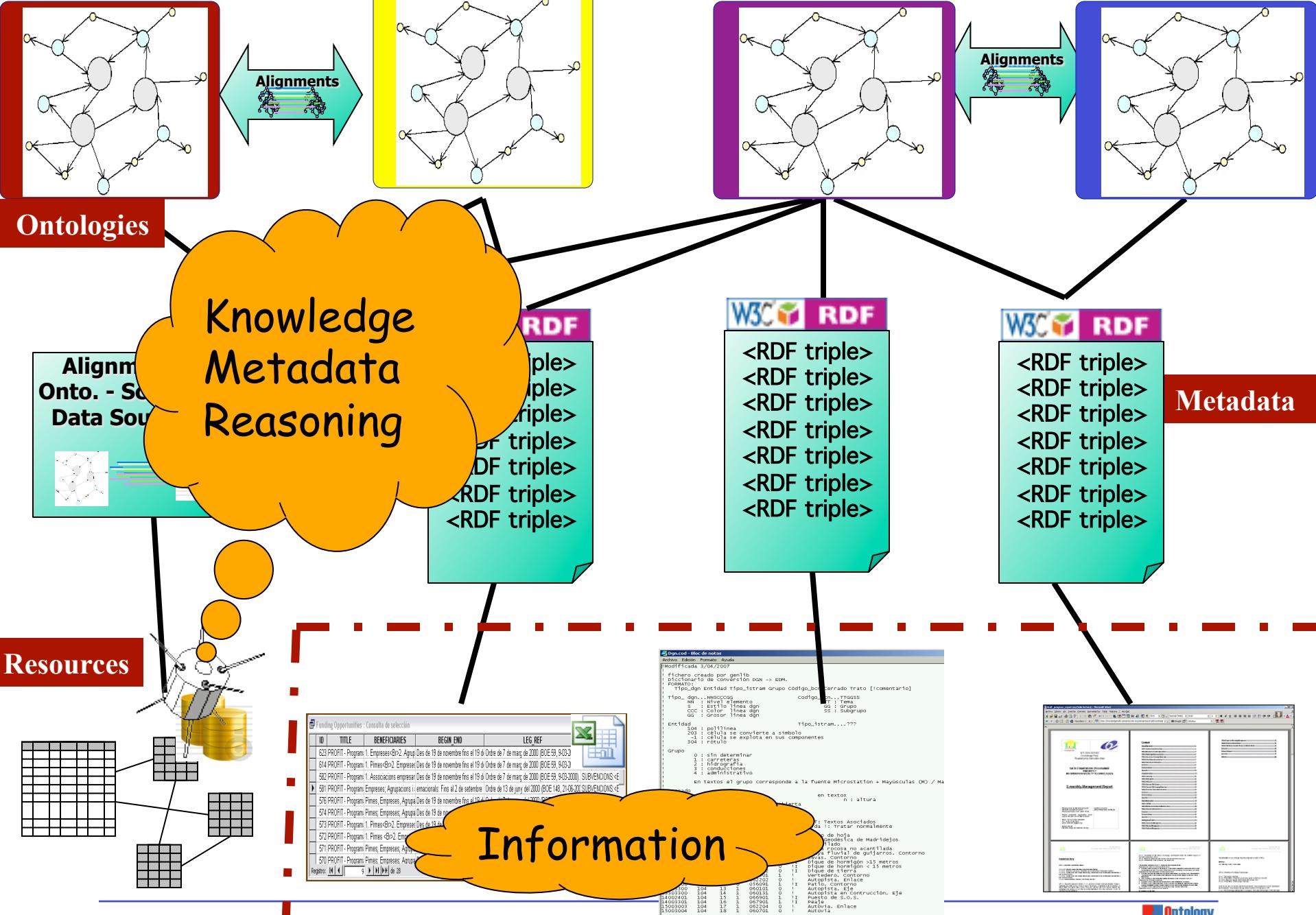
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ABS_START_ORBIT=+02596
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* TABLE_SPT_DESCS*
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ENDRECORD sen_vhr
RECORD sen_dbr
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ENDFILE

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Corporative Semantics





Semantic portals



Agents



Portal Administrators
Ontologies and Software



External resources

Semantic Driven

Permission-based

User Oriented



Extranet Users



Edición de los contenidos del portal (Atributos)

KnowledgeWeb Project FP6-507482

Documentation Event Organization Person Project Administration Logout

RDFS Person

Instance of PhD Student: Angel López-Cima

Move instance to: Administrative Staff Send Continue to relations >>

Instance Name: Angel López-Cima

Instance Attribute	Range	Cardinality	Value
Full Name	String	(1,1)	Angel Lopez-Cima
Photo	Enter an URL		Angel.jpg
Email	Enter an URL		alopez@fi.upm.es
Homepage	Enter an URL		
Date	String	(1,N)	16/10/1976
City	String	(1,1)	Spain
Zip code	String	(0,1)	28660
Street Address	String	(1,1)	Campus Montegancedo, s/n
Telephone	String	(0,1)	+34 91 336 6604
Fax	String	(0,1)	+34 91 352 4819

Upload a file to Angel López-Cima.Photo:

Select a file to upload: Examinar... Envirar consulta

Select Date, Please... October 1976

Mo Tu We Th Fr Sa Su
27 28 29 30 1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31

Send Continue to relations >>

©Asunción Gómez-Pérez

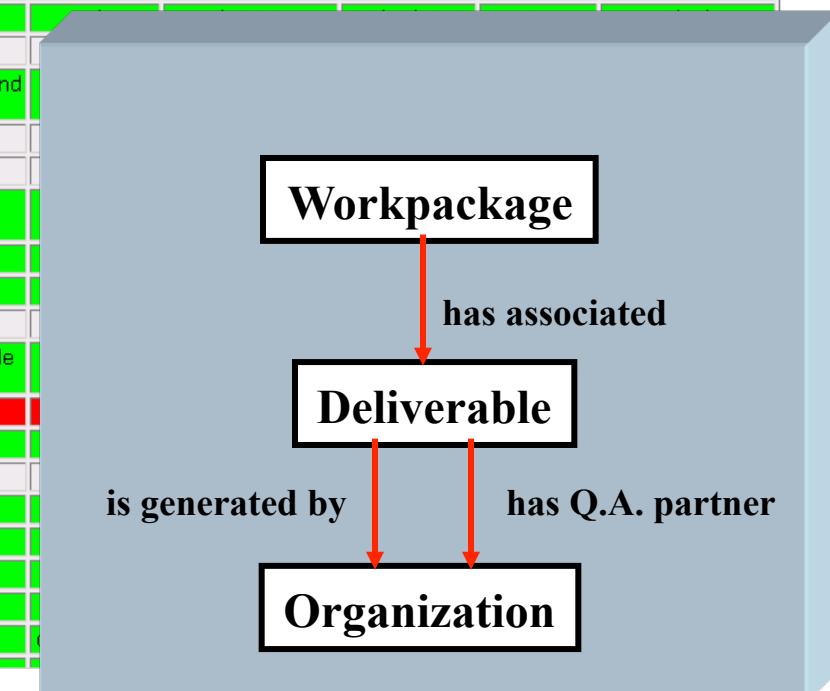
- 47

Ontology Engineering Group

Semantic-based Visualisation

Status of the Deliverables

Workpackage	Deliverable	Generated By	Q.A. Responsibility	Delivery Date	Project Month	Status
WP1: Ontologies	D1.1: State of the art in ontologies from the SW perspective	UPM	IFI	11/08/2002	2	Final
	D1.2: Kernel Ontology Specification, Knowledge architecture	UPM	UdS	09/24/2003	27	Final
	D1.3: Ontology Workbench Specification	UPM	UniLiv	09/26/2003	27	Final
	D1.4: Ontology Alignment Solution	IFI	UPM	09/12/2003	27	Final
WP2: Window on Semantic Web languages	D2.1: State of the art on Semantic Web languages	IFI	UPM	02/17/2003	2	Final
	D2.2: Report on SW languages evolution	IFI	iSOCO	08/28/2003	30	Final
WP3: Annotation services	D3.1: State of the art on annotation tools and services	iSOCO	UdS	02/28/2003	2	---
	D3.2: Methodology for the development of wrappers and annotation tools	iSOCO	UdS	09/15/2003	10	---
	D3.3: Annotation services for static resources	iSOCO	UPM	---	10	---
	D3.4: Annotation services for dynamic resources	iSOCO	UniLiv	---	23	---
	D3.5: Annotation services for multimedia content					
	D3.6: Annotation services for web services					
WP4: Semantic indexation and routing	D4.1: State of the art on indexation, routing techniques and negotiation techniques					
	D4.2: Semantic Index Solution					
	D4.3: Routing Solution					
WP5: Multilinguality	D5.1: State of the art on multilinguality for ontologies, annotation services and user interfaces					
	D5.2: Multilinguality and ontologies					
	D5.3: Multilingualism and annotation services					
	D5.4: Multilingual user interface					
WP6: User interface and visualisation services	D6.1: State of the art on visualisation technologies feasible for the Semantic Web					
	D6.2: Ontology visualisation core services					
	D6.3: Semantic Web content visualisation services					
	D6.4: Semantic Index and Routing Monitor service					
WP7: Definition and integration	D7.1: System specification					
	D7.2: Cooperation protocol definition					
	D7.3: Application development guidelines					
	D7.4: Integration test plan					
WP8: Test case 1. Fund finder for	D8.1: Test case system specification					



Semantic markup based on many different ontologies

KMI

Search []

Home News Projects Technologies Publications People

People [People/All Members]

Members [78] [A][B][C][D][E][F][G][H][I][J][K][L][M][N][O][P][Q][R][S][T][U][V][W][X][Y][Z]

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Research Assistant [info] [homepage] [email] [RDF/XML]

Cristian Barlaadeanu Consultant [info] [email] [RDF/XML]

Robbie Bays Systems & Network Administrator [info] [email] [RDF/XML]

Ontology Engineering Group. Powered by ODESeW - Mozilla Firefox

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Google Buscar Marcadores Corregidor ortográfico Traducir Envíar a Configuración

Ontology Engineering Group

Home Access information Projects

Current Completed Other Projects' People

Student University Staff Past Collaborators Publications

By Date Author Subject

People (22)

Dra. Asunción de María Gómez Pérez asun@fi.upm.es Phone: 34 913367439 Fax: 34 913524819 More

Dra. Guadalupe Aguado de Cea lupe@fi.upm.es Phone: 34 913367415 Fax: 34 913365472 More

Dr. Mariano Fernández-López mfernandez@fi.upm.es Phone: 34 913366605 Fax: 34 913524819 More

Dra. Inmaculada Álvarez de Mon Reja Dra. Rosario Plaza Arache Jesús Barrasa Rodríguez

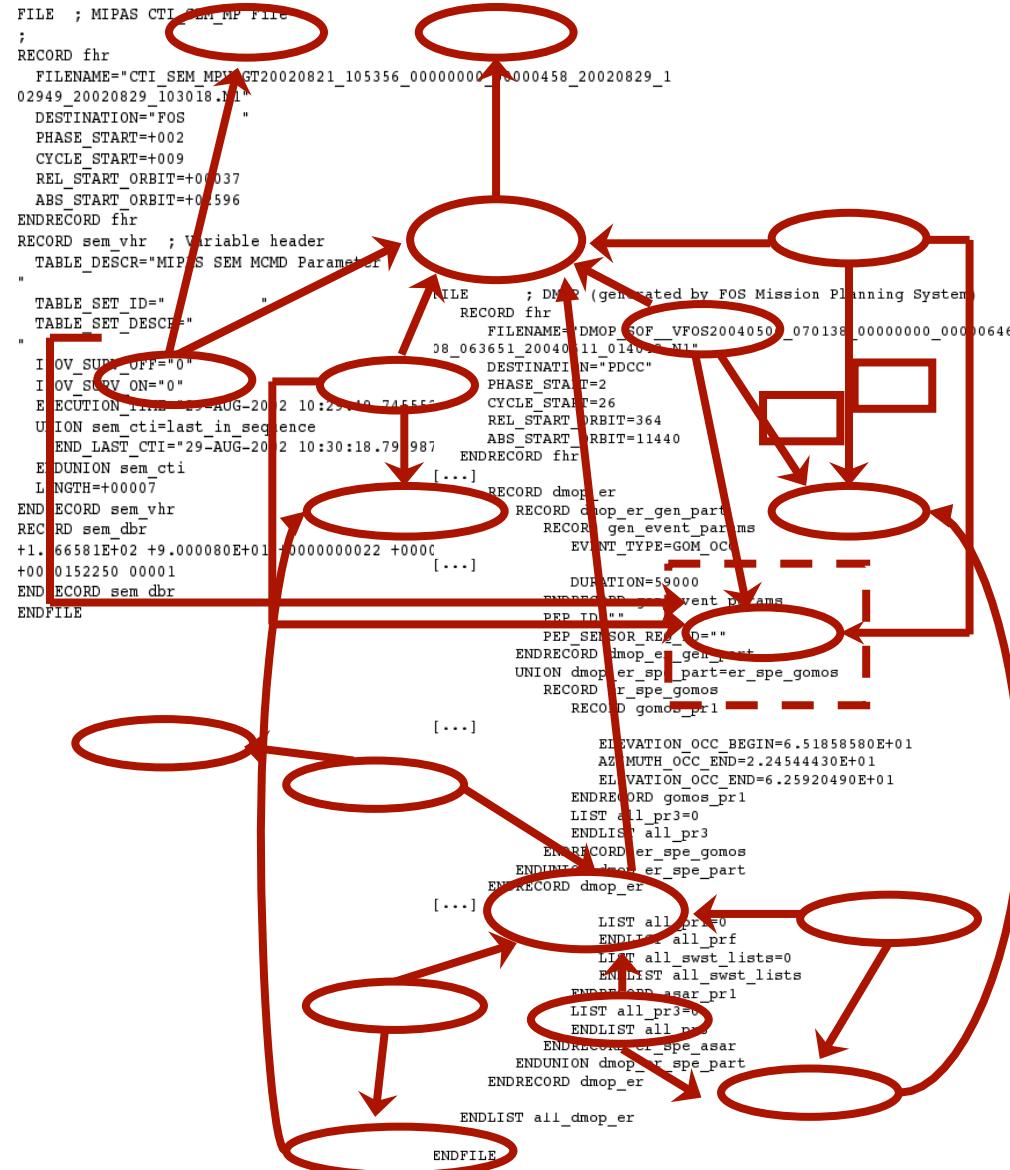
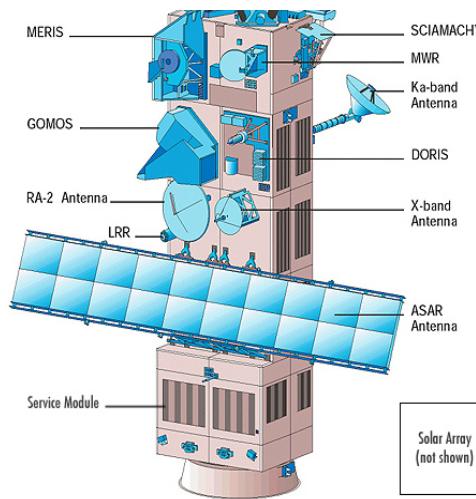
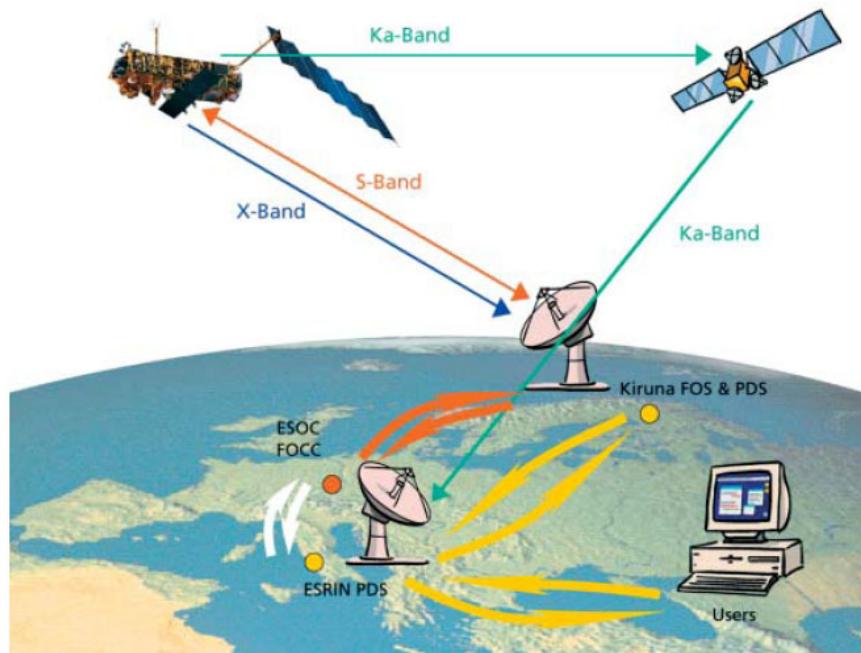
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José Ángel Ramos Gargantilla María del Carmen Suárez-Figueroa Miguel Esteban Gutiérrez
jaramos@fi.uma.es mcsuarez@fi.uma.es mesteban@dalitz.csfi.uma.es

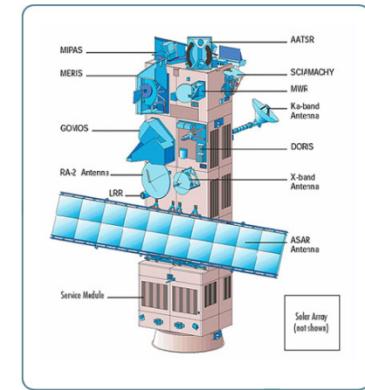
Conceptual Mismatch

Creating metadata for processing satellite information



Processing satellite information

- Geographically distributed organizations
- Organizations send plans to the Envisat
- Envisat has Instruments on board that take “pictures”
- Envisat sends back information to the Earth



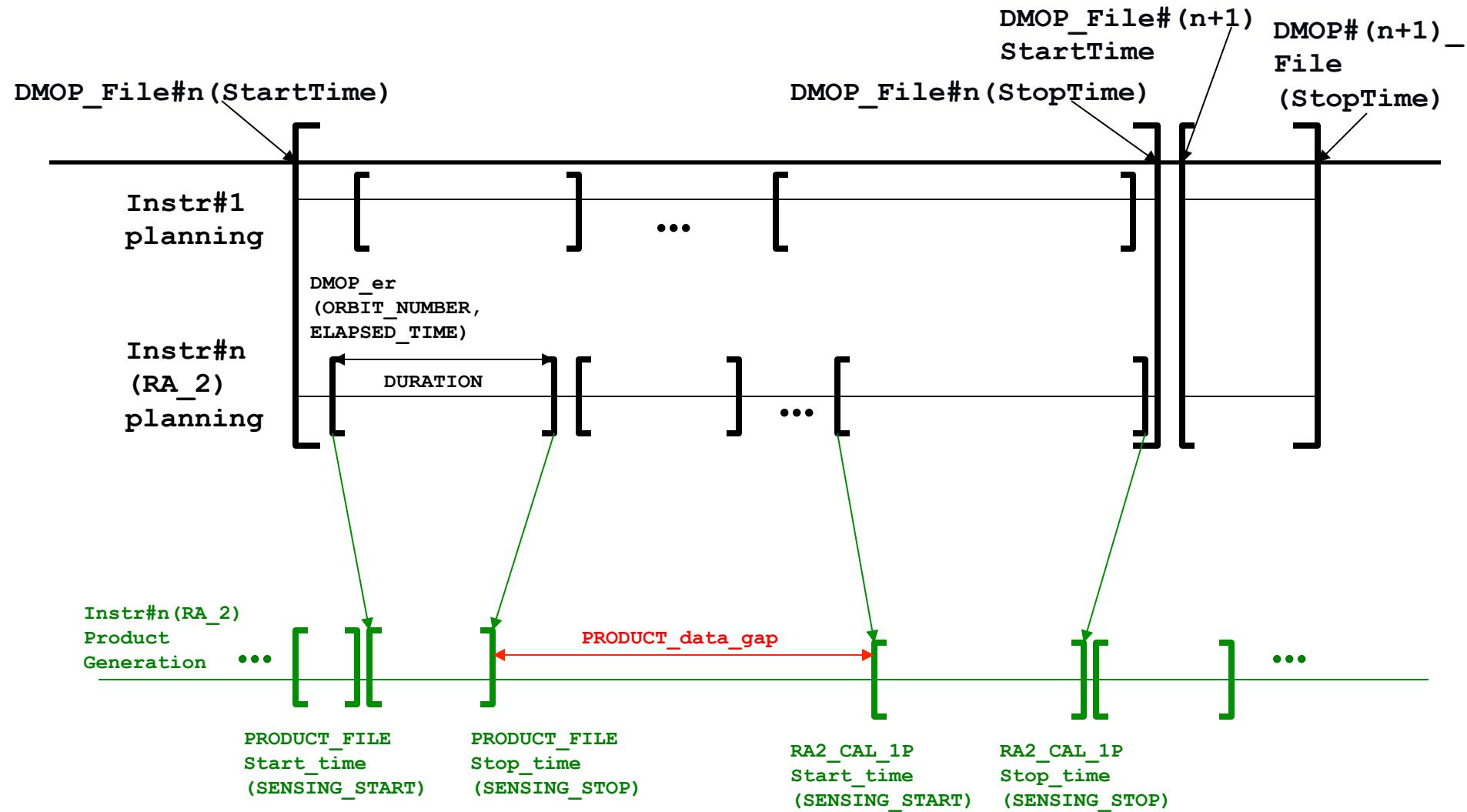
USE CASE DIMENSION:

- 1 planning file (DMOP) is generated per planning day
 - Parameters for instrument operation (taking pictures)
 - Parameters for the satellite general configuration.
 - MacroCommands (MCMD's): translation from planning
- For each DMOP file:
 - Hundreds of planning activities per instrument and instrument mode
 - Hundreds of Product files are generated per instrument and instrument mode
 - Each product file corresponds with a planning activity



Analysis needs to be carried out on the existence, contents and correlation of these files

Comparison between planning and product generation



Generating files in RDF

FILE System) ; DMOP (generated by FOS Mission Planning
RECORD ID

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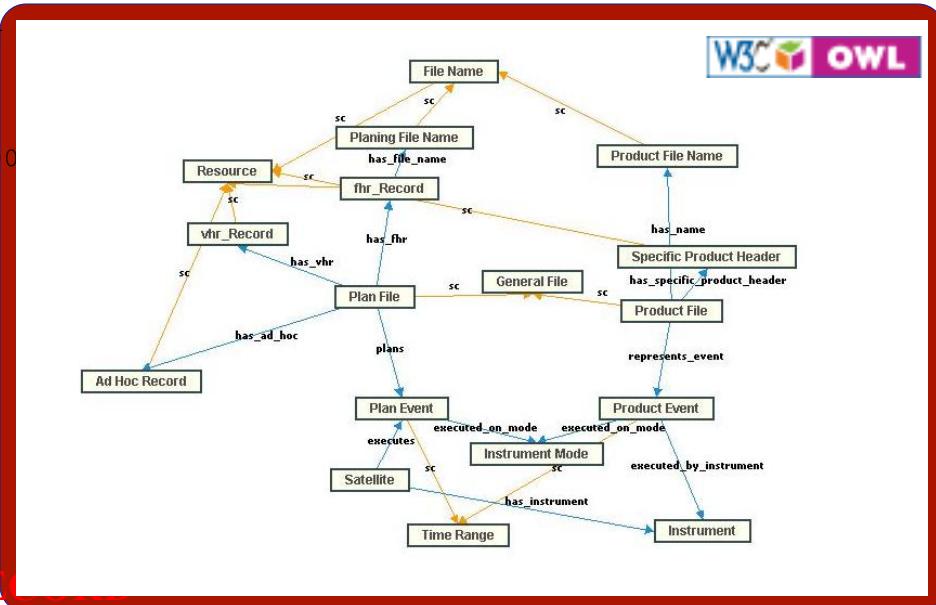
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  ENDRECORD dmop_er
ENDLIST all_dmop_er
ENDFILE

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RECORD parameters

RECORD parameters
cor
other
s



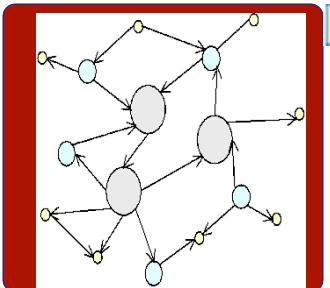
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<rdf:Description rdf:about="http://protege.stanford.edu/kb#11224">
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<NS0:event_id>"GOM_OCC_0000000541299"</NS0:event_id>
<NS0:duration rdf:datatype="http://www.w3.org/2001/XMLSchema#int">53000</NS0:duration>
<NS0:orbit_number rdf:datatype="http://www.w3.org/2001/XMLSchema#int">20552</NS0:orbit_number>
<NS0:elapsed_time rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2452293</NS0:elapsed_time>
<NS0:event_type rdf:resource="http://protege.stanford.edu/kb#10713"/>
</rdf:Description>

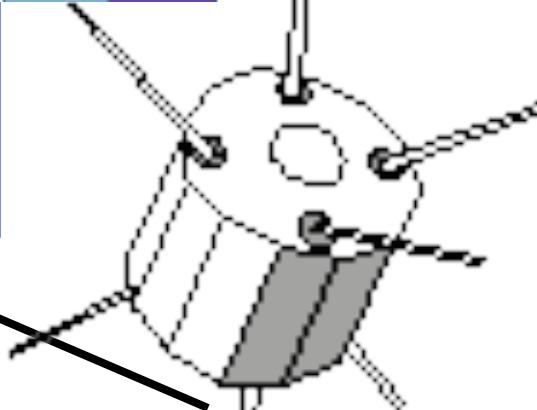
W3C RDF

1 Ontology

1 reference ontology for annotating all files
RDF files (instances) are distributed



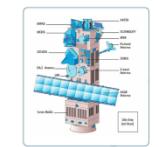
W3C OWL



Distributed
Metadata for
Planning files

W3C RDF

<RDF triple>
<RDF triple>
<RDF triple>
<RDF triple>
<RDF triple>



Distributed
Metadata for
Product files

W3C RDF

<RDF triple>
<RDF triple>
<RDF triple>
<RDF triple>
<RDF triple>

PRODUCT_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0*
FILE_NAME=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0.dwg
FILE_TYPE=DWG
ACQUISITION_STATUS=0
PROJ_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0*
GEOMETRY_TYPE=2D
OWNER_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0
OWNER_NAME=999
PEF_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0
EXCLUDED_SHOP_ER_SHP_PART
UNION_SHOP_ER_SHP_PARTER_SHP_GCODE
EXCLUDED_SHOP_ER_SHP_PART
RECORD_gcode_pr1
RECORD_gcode_pr2
ELEVATION_DOC_BRIDGE=0.00000000+01
ALTITUDE_DOC_BRIDGE=2.14444444200000
ELEVATION_DOC_END=4.25925440000001
ENDPOINT_DOC_BRIDGE
LIST_all_pr1
LIST_all_pr2
HEADING_all_pr1
HEADING_all_pr2
EXCLUSION_SHOP_ER_SHP_PART
EXCLUDED_SHOP_ER_SHP_PART
...
LIST_all_pr1
ENCLIST_all_pr1
LIST_all_pr1
ENCLIST_all_pr2
ENCLIST_all_pr1
LIST_all_pr1
ENCLIST_all_pr1
EXCLUSION_SHOP_ER_SHP_PART
EXCLUDED_SHOP_ER_SHP_PART
RECOLIST_all_dwg_pr1

The planning
files



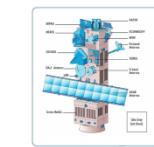
The product
files

ASCII part of the file

FILE_NAME=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0.dwg
FILE_TYPE=DWG
ACQUISITION_STATUS=0
PROJ_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0*
GEOMETRY_TYPE=2D
OWNER_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0
OWNER_NAME=999
PEF_ID=12_11_20090118131212_121120_00000072098_09012_2081_35_44_R0
EXCLUDED_SHOP_ER_SHP_PART
UNION_SHOP_ER_SHP_PARTER_SHP_GCODE
EXCLUDED_SHOP_ER_SHP_PART
RECORD_gcode_pr1
RECORD_gcode_pr2
ELEVATION_DOC_BRIDGE=0.00000000+01
ALTITUDE_DOC_BRIDGE=2.14444444200000
ELEVATION_DOC_END=4.25925440000001
ENDPOINT_DOC_BRIDGE
LIST_all_pr1
LIST_all_pr2
HEADING_all_pr1
HEADING_all_pr2
EXCLUSION_SHOP_ER_SHP_PART
EXCLUDED_SHOP_ER_SHP_PART
...
LIST_all_pr1
ENCLIST_all_pr1
LIST_all_pr1
ENCLIST_all_pr2
ENCLIST_all_pr1
LIST_all_pr1
ENCLIST_all_pr1
EXCLUSION_SHOP_ER_SHP_PART
EXCLUDED_SHOP_ER_SHP_PART
RECOLIST_all_dwg_pr1

Binary part of the file

10101110101010101000...
10110101101010101000...
10110101101010101000...



Binary part of the file

10101110101010101000...
10110101101010101000...
10110101101010101000...

GeoLinkedData

- It is an open initiative whose aim is to enrich the Web of Data with Spanish geospatial data.
- This initiative has started off by publishing diverse information sources, such as National Geographic Institute of Spain (IGN-E) and National Statistics Institute (INE)



- <http://geo.linkeddata.es>

Process for Publishing Linked Data on the Web

Identification
of the data sources

Vocabulary
development

Generation
of the RDF Data

Publication
of the RDF data

Data cleansing

Linking
the RDF data

Enable effective
discovery

