# Semantic Web Use Cases and Case Studies

## World Wide Web Consortium

(Last update: 2012-06-11)

# > What are these?

- Testimonials on how Semantic Web technologies are used by companies and institutions
  - **Case Studies** describe *deployed* systems that have been deployed within an organization
  - **Use Cases** are systems an organization has built as a prototype system, but it is not currently being used by business functions.
- All use cases and case studies have been submitted by the relevant institution, and *not* produced by W3C…

# > These slides…

- … are not a separate presentation
- … are here to be included in other presentations; cut and paste should be all right
- For the detailed description of the various use cases see the Use Cases' homepage that links to the specific descriptions

# > Current list: Use Cases

- *Reduction of Errors in Radiological Procedure Orders*, Agfa Healthcare, Belgium
- *B2B Integration with Semantic Mediation*, BT Research and Venturing, United Kingdom
- *Active Knowledge Management for Integrated Operations*, Computas AS and Statoil, Norway
- *Enhancing Web Searches within the Principality of Asturias*, CTIC Foundation, University of Oviedo, and the Principality of Asturias, Spain

# > Current list: Use Cases (cont)

- *Drug Ontology Project for Elsevier,* Elsevier, Aduna, and Vrije Universiteit Amsterdam
- *Ontology-Driven Information Integration and Delivery,* Chevron Information Technology Company, United States
- *Applying the Semantic Web to Internal Compound Repurposing*, Pfizer Ltd., United Kingdom
- *Semantic Web Technologies in Automotive Repair and Diagnostic Documentation*, Renault, France
- *How Ontologies and Rules Help to Advance Automobile Development*, Audi, Achievo Inproware GmbH, and ontoprise GmbH, Germany

# > Current list: Use Cases (cont)

- *Helping New Judges Answer Complex Legal Questions*, Spanish General Council of the Judiciary, Spain
- *WEASEL, Vodafone R&D Corporate Semantic Web*, Vodafone Group Research & Development, Spain
- *Mobile Content Recommendation System*, Saltlux and Korea Telecom Freetel, Korea
- *OntoFrame 2008—A Semantic Portal Service of Academic Research Information*, KISTI, Korea

# > Current list: Case Studies

- *The Semantic Web for the Agricultural Domain, a Semantic Navigation of Food, Nutrition and Agriculture Journal,* Food and Agriculture Organization of the United Nations, Italy
- *Real Time Suggestion of Related Ideas in the Financial Industry*, Bankinter, Spain
- *NASA's Expertise Location Service*, Clark & Parsia, LLC, and NASA
- *A Semantic Web Content Repository for Clinical Research*, Cleveland Clinic, United States
- *KDE 4.0 Semantic Desktop Search and Tagging,* Nepomuk Project, Germany
- *Semantic matchmaking for eTourism in Zaragoza*, City Council of Zaragoza and CTIC Foundation, Spain

# > Current list: Case Studies (cont)

- *Active Knowledge Management for Integrated Operations*, Computas AS and Statoil, Norway
- *Digital Music Archive*, ESIS and NRK, Norway
- *Semantic Tags*, Faviki, Serbia
- *An Ontology of Cantabria's Cultural Heritage*, Fundación Marcelino Botín, Spain
- *Prioritization of Biological Targets for Drug Discovery,* Eli Lilly, United States
- *Geographic Referencing Framework,* Ordnance Survey, United Kingdom
- *Enhancement and Integration of Corporate Social Software Using the Semantic Web*, Electricité de France and LaLIC, Université Paris-Sorbonne

# > Current list: Case Studies (cont)

- *Composing Safer Drug Regimens for the Individual Patient using Semantic Web Technologies,* PharmaSURVEYOR Inc., United States
- *Public Health Situation Awareness, School of Health Information Sciences,* University of Texas, United States
- *Improving the reliability of Internet search results using Search Thresher,* Segala, Ireland
- *Enhancing Content Search Using the Semantic Web,* Siderean Software and Oracle Corporation, United States
- *Semantic MDR and IR for National Archives*, Saltlux and National Archives of Korea, Korea
- *Use of Semantic Web Technologies on the BBC Web Sites*, BBC, United Kingdom

# > Current list: Case Studies (cont)

- *The swoRDFish Metadata Initiative: Better, Faster, Smarter Web Content,* Sun Microsystems, Inc., and Zepheira, United States
- *Use of Semantic Web Technologies in Natural language interface to Business Applications, Tata Consultancy Services Limited, India*
- *Semantic Content Description to improve discovery,* Vodafone, United Kingdom
- *Integrated, Connected Search Service for Technical Standards Information*, KISTI and KAST, Korea
- *iLaw—Intelligent Legislation Support System*, KISTI and MOJ, Korea

# > Current list: Case Studies (cont)

- *An Intelligent Search Engine for Online Services for Public Administrations, Municipality of Zaragoza, Spain*
- *Semantic-based Search and Query System for the Traditional Chinese Medicine Community*, Zheijang University and China Academy of Chinese Medicine Sciences, China
- *Improving Web Search using Metadata*, Yahoo! Research, Spain
- *Twine*, United States
- *Publishing STW Thesaurus for Economics as Linked Open Data*, Germany

# > Current list: Case Studies (cont)

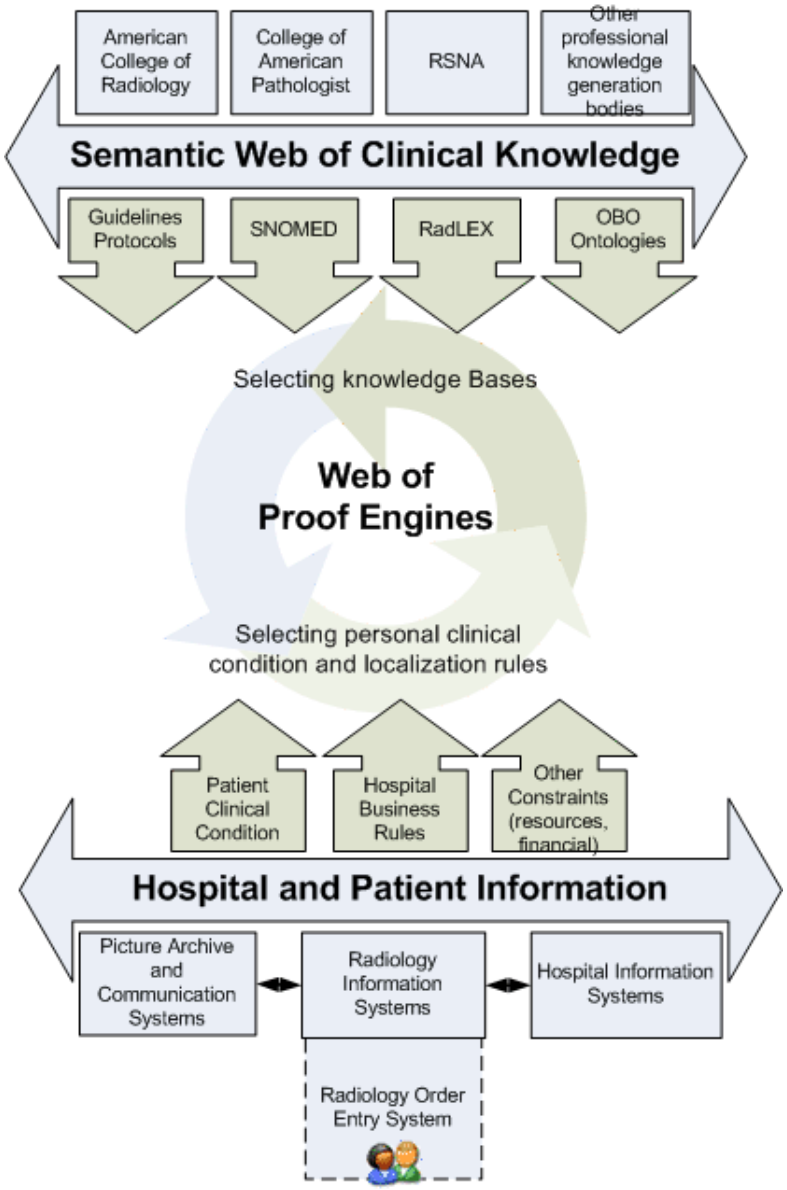
- *Online Resource for Information on Aquatic Sciences*, Spain
- *Applied Semantic Knowledgebase for Detection of Patients at Risk of Organ Failure through Immune Rejection*, USA and Canada
- *Contextual Search for Volkswagen and the Automotive Industry*, United Kingdom
- *Enriching and sharing cultural heritage data in Europeana*, The Netherlands

# *Reduction of Errors in Radiological Procedure Orders*

- Clinical (textual) guidelines exist to assist clinicians for the appropriate radiological procedures
  - guidelines and protocols from different OWL sources are integrated
- SW engines generate recommendations for radiology orders
- Prevents, e.g., medical errors, spreads the need for development/maintenance of knowledge bases, traces the provenance of facts and rules in decision making

*Courtesy of Jos De Roo and Helen Chen, Agfa Healthcare, (SWEO Use Case)*

# > Agfa Healthcare



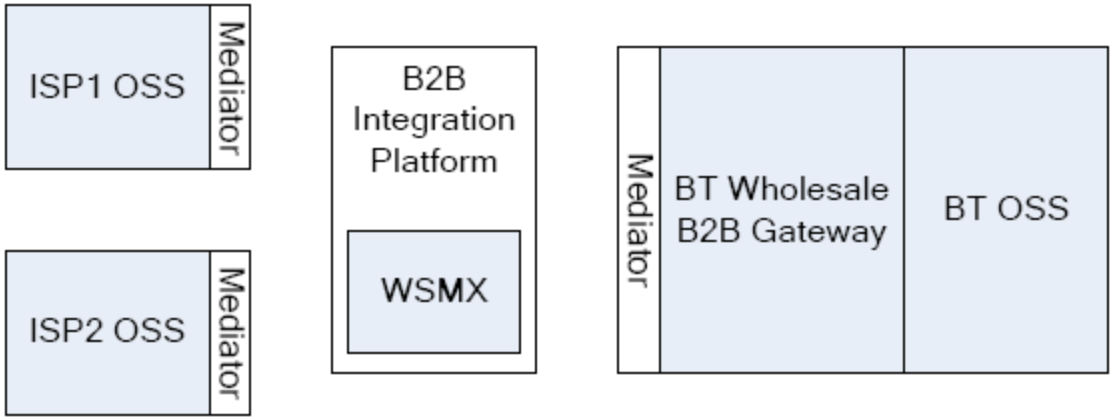

*Courtesy of Jos De Roo and Helen Chen, Agfa Healthcare, (SWEO Use Case)*

## *Integration with Semantic Mediation*

- The complexity of supply chains has increased, they involve many players of differing size and function
- Support for “Operational Support Systems (OSS)” integration using semantic descriptions of system interfaces and messages
- Internet Service Providers integrate their OSS-s with those of BT (via a gateway)
- Integration of heterogeneous OSS systems of partners
- The approach reduces costs and time-to-market; ontologies allow for a reuse of services

*Courtesy of Alistair Duke, BT, (SWEO Use Case)*

# > BT Research and Venturing

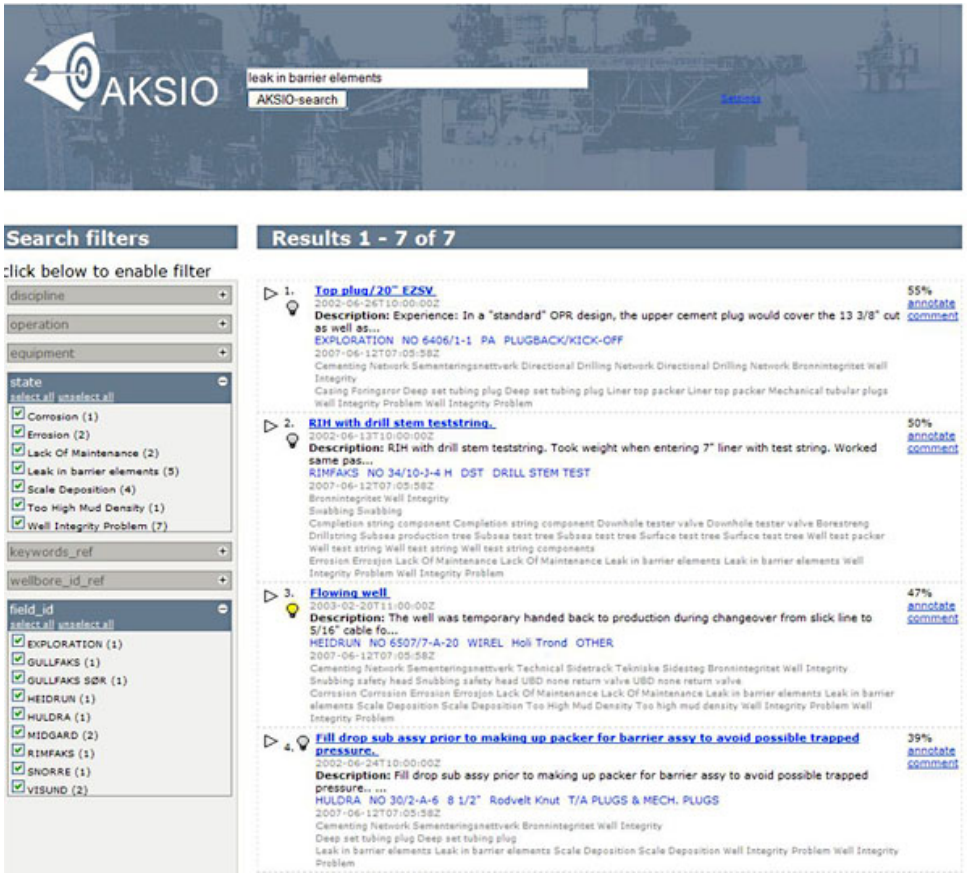



*Courtesy of Alistair Duke, BT, (SWEO Use Case)*

# > Computas AS and Statoil

## *Active Knowledge Management for Integrated Operations*

- Integration of experience and data in the planning and operation of deep sea drilling processes
- Discover relevant experiences that could affect current or planned drilling operations
  - uses an ontology backed search engine




*Courtesy of David Norheim and Roar Fjellheim, Computas AS (SWEO Use Case)*

## *Enhancing Web Searches within the Principality of Asturias*

- Portal to access governmental information (new laws, announcement, notifications, funding opportunities)
  - These information often use special juridical jargon
  - Traditional syntactic search become difficult: the user would use different terms than the juridical text
- A semantic web based “bridge” is created to search, using SKOS vocabularies and other ontologies

*Courtesy of Diego Berrueta and Luis Polo, CTIC, U. of Oviedo, and the Principality of Asturias, (SWEO Case Study)*

# > CTIC, U. of Oviedo, Asturias

*Courtesy of Diego Berrueta and Luis Polo, CTIC, U. of Oviedo, and the Principality of Asturias, (SWEO Case Study)*

# > Chevron Information Technology

## *A Survey of Semantic Web Technology in the Oil and Gas Industry*

- Fluor Corporation's ADI project: exchange, and hand-over of information between all parties involved during the entire life cycle of a plant, using RDF/OWL
- Norwegian Daily Production Report (DPR): standardize production data reporting
- AKSIO project: develops an integrated system to support drilling operations in offshore oilfields

*Courtesy of Frank Chum, (SWEO Use Case)*

## *A Survey of Semantic Web Technology in the Oil and Gas Industry (cont.)*

- Integrated Information Platform (IIP) project: integrates data for subsea seismic equipment, drilling, production, onshore operations, expert centers, …
- InfoWeb: knowledge base to include such as refineries and chemical plants, power plants, etc, based on ISO 15926
- Geosciences Network (GEON Grid): supports the National Carbon Sequestration database, using OWL

*Courtesy of Frank Chum, (SWEO Use Case)*

## *Ontology-Driven Information Integration and Delivery*

- A portal for the search, navigation and delivery of the underlying resources
- It establishes stable and reusable domain indexes that are separate from the organization of the portal
- The ontology-driven navigation provides relationships discovery, advanced drill down capabilities, better aggregation, organization, filtering

*Courtesy of Frank Chum, (SWEO Use Case)*

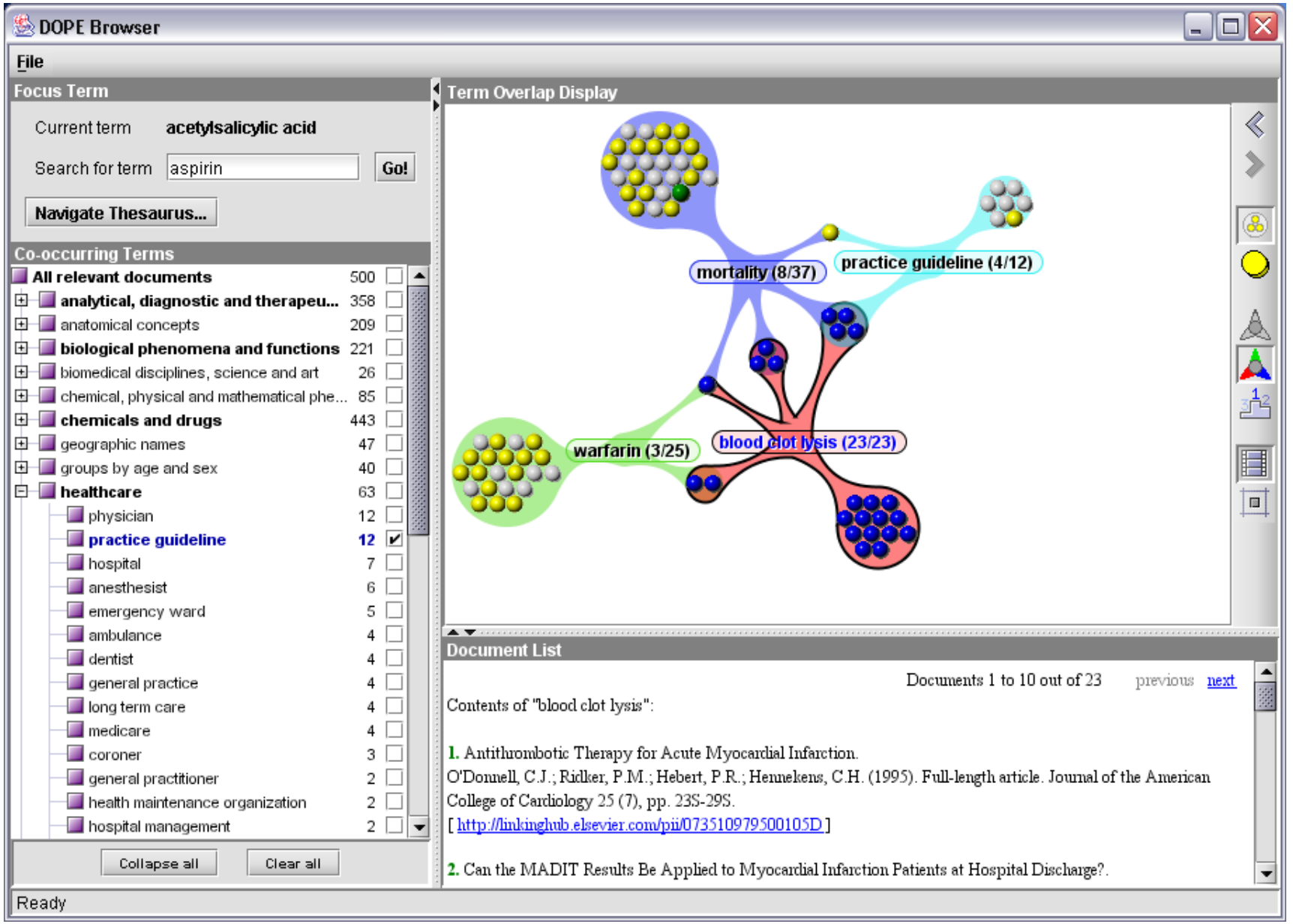
# > Elsevier, Aduna, VU Amsterdam

## *Drug Ontology Project for Elsevier (DOPE)*

- Goal: provide a single interface access to multiple information sources (in the life science domain)
- Use and RDF based thesauri and metadata to index and describe different data sources
- Provide a search facility and browser using the thesauri and the metadata to help search, find related items, etc

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

# > Elsevier, Aduna, VU Amsterdam




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

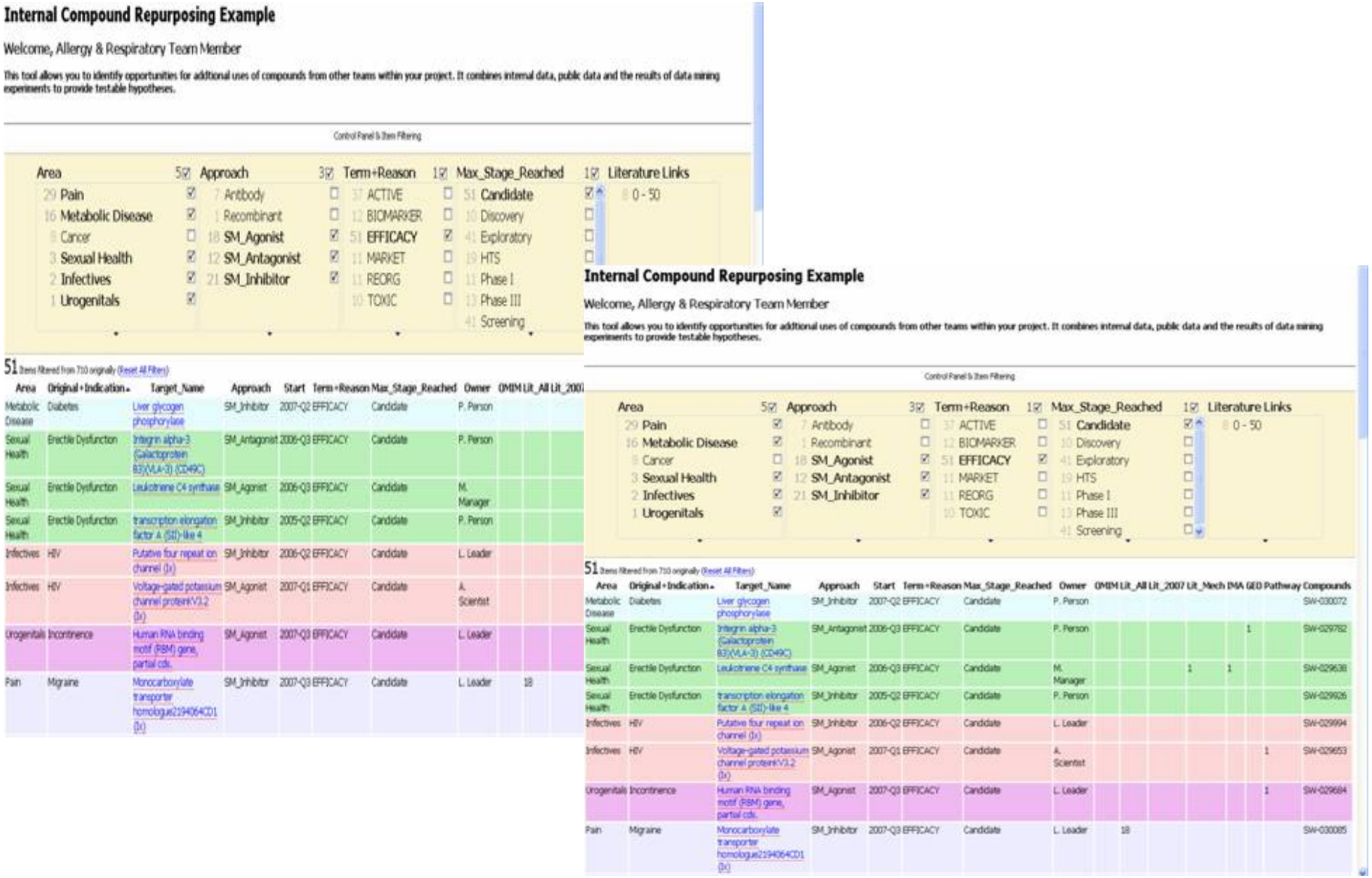
# > Pfizer Ltd.

## *Applying the Semantic Web to Internal Compound Repurposing*

- Re-use data accumulated in older (possibly abandoned or unsuccessful) drug discovery experiments
  - goal is to maximize efficiency and use previous work
- Old data are kept in XML and/or databases, but export key "facts" in RDF
- The integrated data is visualized through, eg, MIT's Exhibit technology

*Courtesy of Nigel Wilkinson, Lee Harland, Pfizer Ltd, Melliyal Annamalai, Oracle (SWEO Case Study)*

# > Pfizer Ltd.




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

# *Semantic Web Technologies in Automotive Repair and Diagnostic*

- 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
- A user progressively discovers the information instructed by the application to perform tests and enter their results.

*Courtesy of François-Paul Servant, Renault, (SWEO Use Case)*

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 - Accès (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

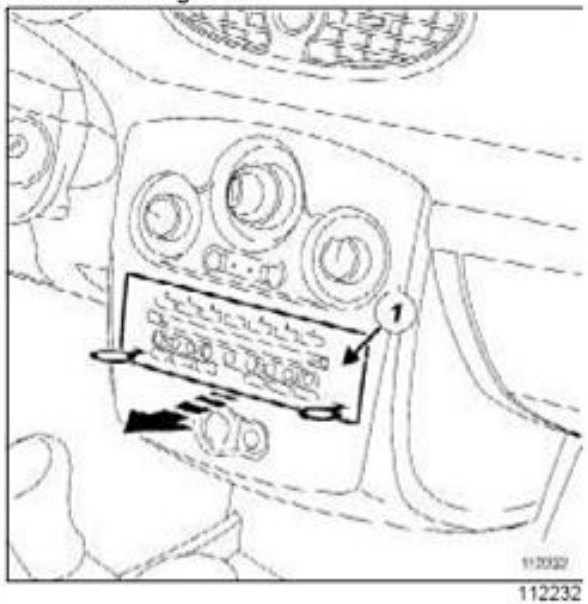
12 %
Connecteur du calculateur de clim régulée - Rebrancher

13 %
Connecteur du calculateur de clim régulée - Remplacement

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

| Outillage spécialisé indispensable | |
|---|---|
| Ms. 1544 | Outil de dépose autoradio - Carminat Becker et Cabasse. |

Autoradio chargeur CD




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

*Courtesy of François-Paul Servant, Renault, (SWEO Use Case)*

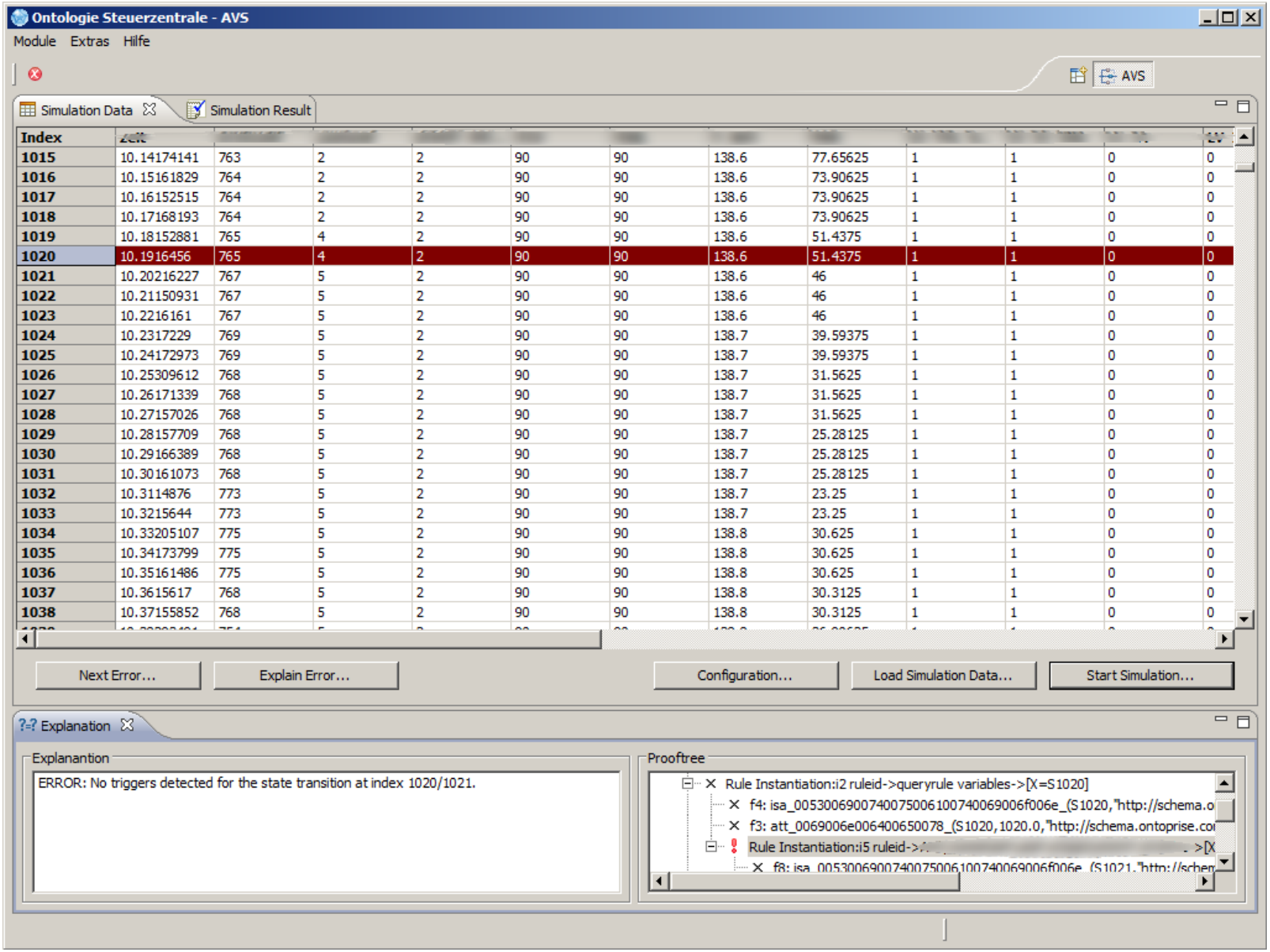
# > Audi, Achievo, and ontoprise

## *How Ontologies and Rules Help to Advance Automobile Development*

- Goal: simulation of car electronic systems' physical conditions
- Usage of a mixture of rules and domain ontologies
  - ie, integration of very different sources of knowledge from different IT systems
- Inference engine also shows the explanation for specific query results

*Courtesy of Thomas Syldatke, Audi, Willy Chen, Achievo, Jürgen Angele, Andreas Nierlich, and Mike Ullrich, ontoprise GmbH, (SWEO Use Case)*

# > Audi, Achievo, and ontoprise




*Courtesy of Thomas Syldatke, Audi, Willy Chen, Achievo, Jürgen Angele, Andreas Nierlich, and Mike Ullrich, ontoprise GmbH, (SWEO Use Case)*

## *Helping New Judges Answer Complex Legal Questions*

- An intelligent FAQ system with over 1000 frequently asked questions
- The questions and answers expert knowledge of over 400 judges from all over Spain, enhanced with ontologies
- The system includes
  - FAQ search system (with natural language interface)
  - jurisprudence data

*Courtesy of Pompeu Casanovas, Spanish General Council of the Judiciary, and Richard Benjamins, iSOCO (SWEO Use Case)*

# > Spanish General Council of the Judiciary

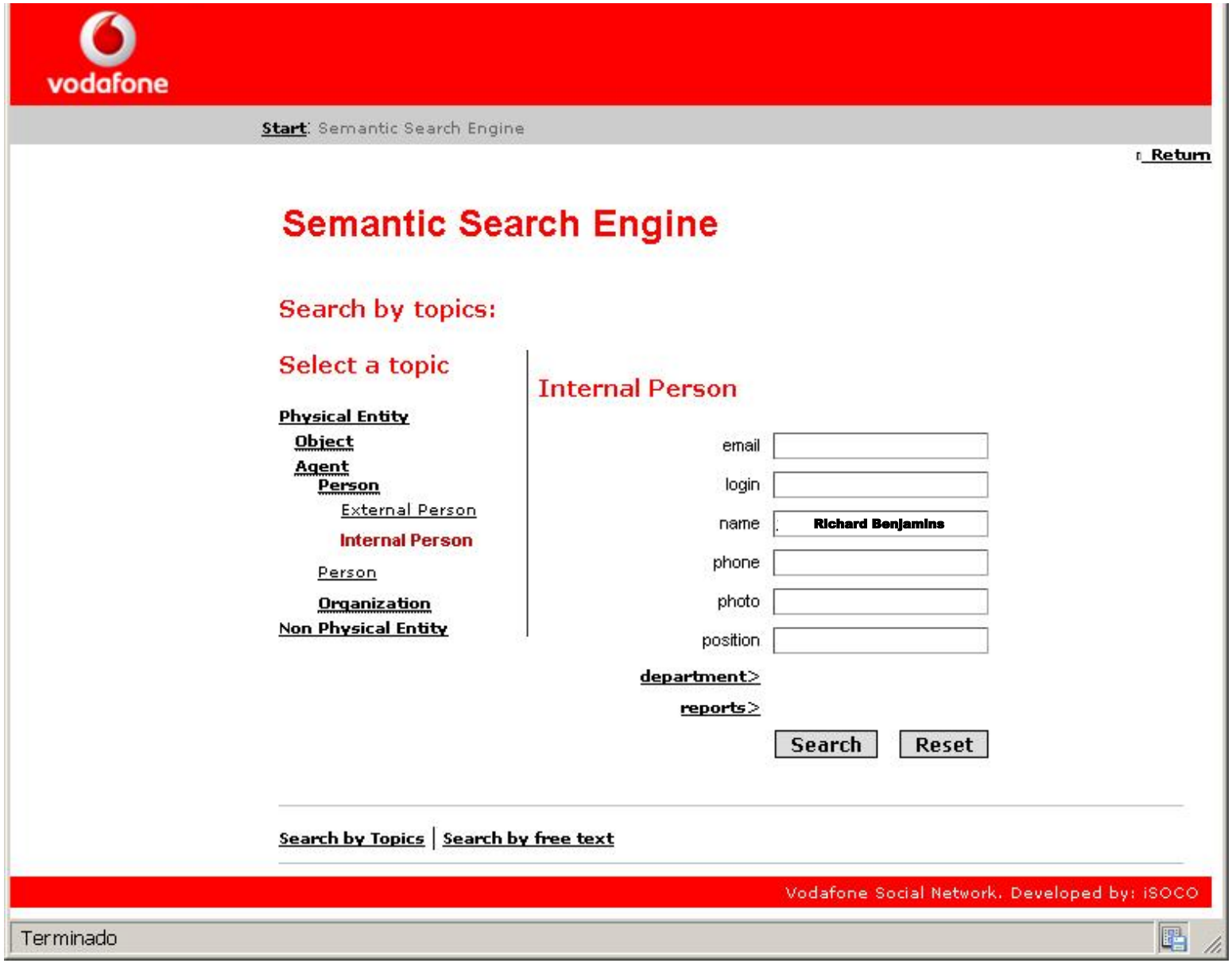
CONSEJO GENERAL DEL PODER JUDICIAL

*Courtesy of Pompeu Casanovas, Spanish General Council of the Judiciary, and Richard Benjamins, iSOCO (SWEO Use Case)*

## *WEASEL, Vodafone R&D Corporate Semantic Web*

- Activities of the Vodafone R&D is recorded by its employees in their corporate web site
  - different file formats, different file organization…
- How to find internal technological know-how?
- WEASEL:
  - automatically annotates data based on a suitable ontology
  - offers a search interface (including natural language search)

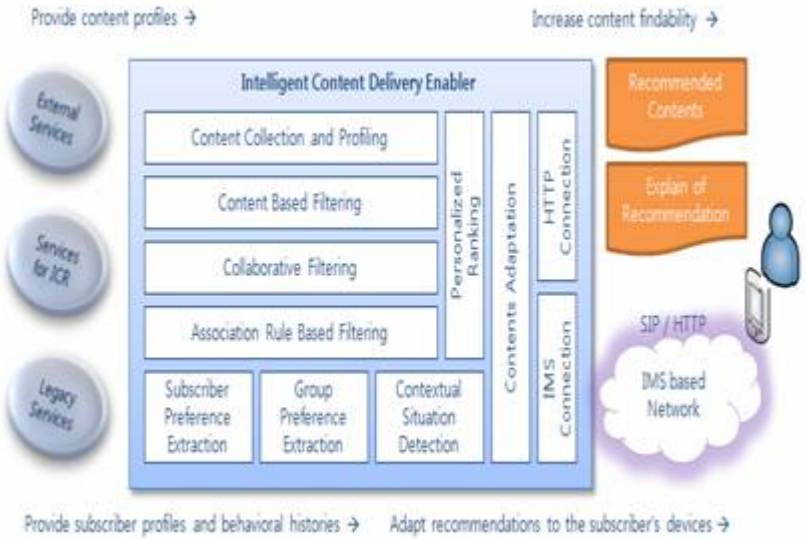
*Courtesy of Juan José Valverde Fúster, Vodafone R&D, and Richard Benjamins, iSOCO, (SWEO Use Case)*




*Courtesy of Juan José Valverde Fúster, Vodafone R&D, and Richard Benjamins, iSOCO, (SWEO Use Case)*

# Mobile Content Recommendation System

- Analyze the user behaviour of IP network users of Korea Telecom Freetel
  - build user characterization based on usage history
- Recommendations for content are provided based on user preference, time, place, weather, etc




*Courtesy of Tony Lee, Jin Woo Kim, and Bok Ju Lee, Saltlux, Kyu Hyup Kim, KTF (SWEO Case Study)*

# > Saltlux & Korea Telecom Freetel

*Courtesy of Tony Lee, Kono Kim, and Eddie Choi, Saltlux, Seong Rae Park, NAK (SWEO Use Case)*

# *OntoFrame 2008—A Semantic Portal Service of Academic Research Information*

- Search portal for academic information for researchers
  - based on a large OWL ontology developed at KISTI
    - reference to journals, proceedings, topics, location of authors,…
- Portal is based on keyword based search plus extra information stemming from the ontology

*Courtesy of Hanming Young, Seungwoo Lee, Mi-Kyoung Lee, Beom-Jong You, Won-Kyung Sung, KISTI (SWEO Use Case)*

*Courtesy of Hanming Young, Seungwoo Lee, Mi-Kyoung Lee, Beom-Jong You, Won-Kyung Sung, KISTI (SWEO Use Case)*

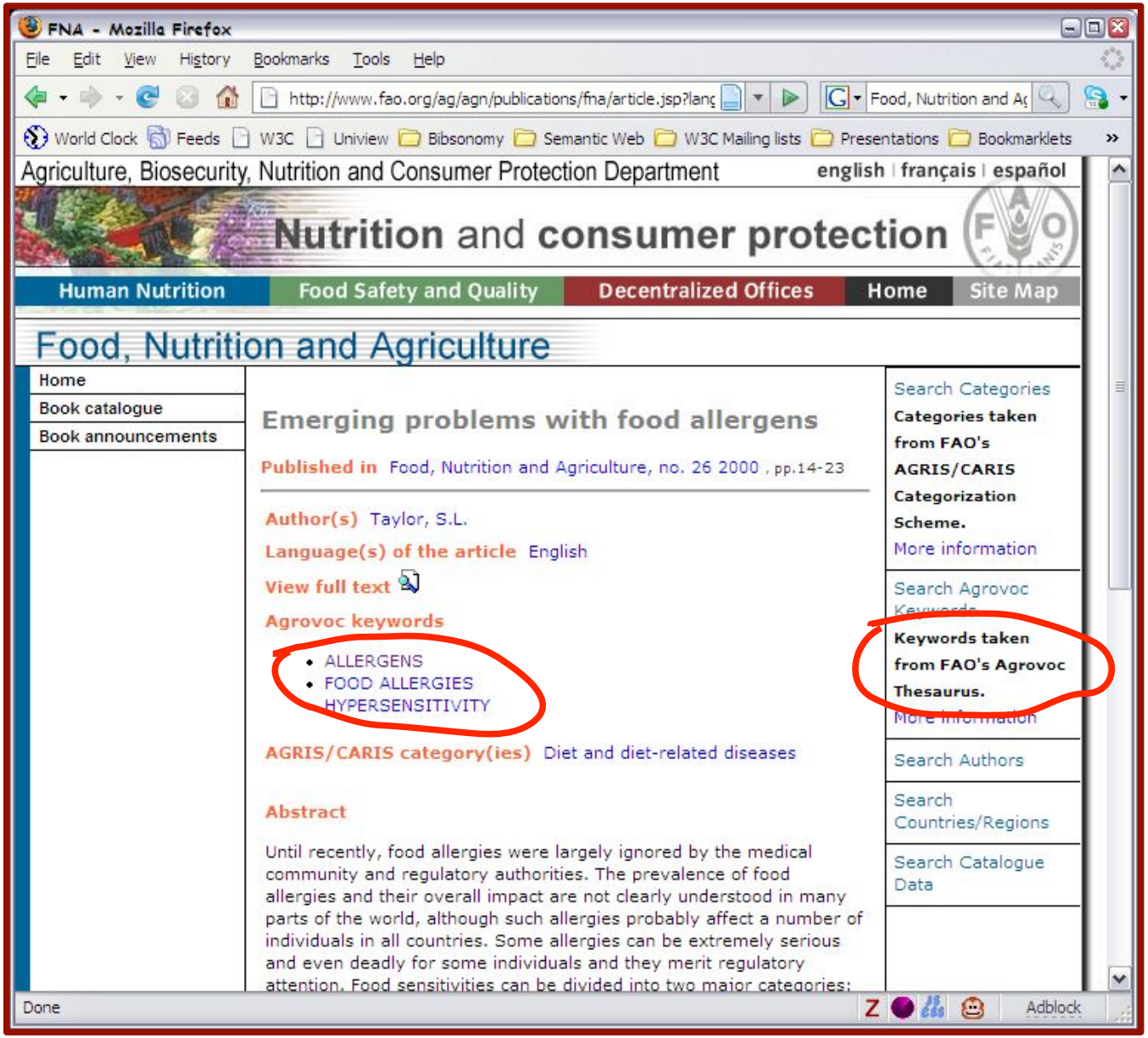
# > Food and Agriculture Organization, UN

## *A Semantic Navigation of Food, Nutrition and Agriculture Journal*

- Development of an AGRIS application ontology for the domain, and AGROVOC, a multilingual agricultural thesaurus
- Using AGROVOC:
  - better information retrieval interface on the thesaurus
  - improved search interface for the “Food, Nutrition and Agriculture (FNA) Journal”

*Courtesy of Gauri Salokhe, Margherita Sini, and Johannes Keizer, FAO, (SWEO Case Study)*

# > Food and Agriculture Organization, UN




*Courtesy of Gauri Salokhe, Margherita Sini, and Johannes Keizer, FAO, (SWEO Case Study)*

# Real Time Suggestion of Related Ideas in the Financial Industry

- Employees of the bank can submit new ideas for innovation, improving the business process, reduce costs, etc
- The entry system analyses the entry, shows similar ideas already in the system based on the *concepts* (not words)
- User gets immediate feedback, system gets better search, analysis, etc

*Courtesy of José Luís Bas Uribe, Bankinter, and Richard Benjamins, iSOCO, (SWEO Case Study)*

# > Bankinter

bankinter.

*Courtesy of José Luís Bas Uribe, Bankinter, and Richard Benjamins, iSOCO, (SWEO Case Study)*

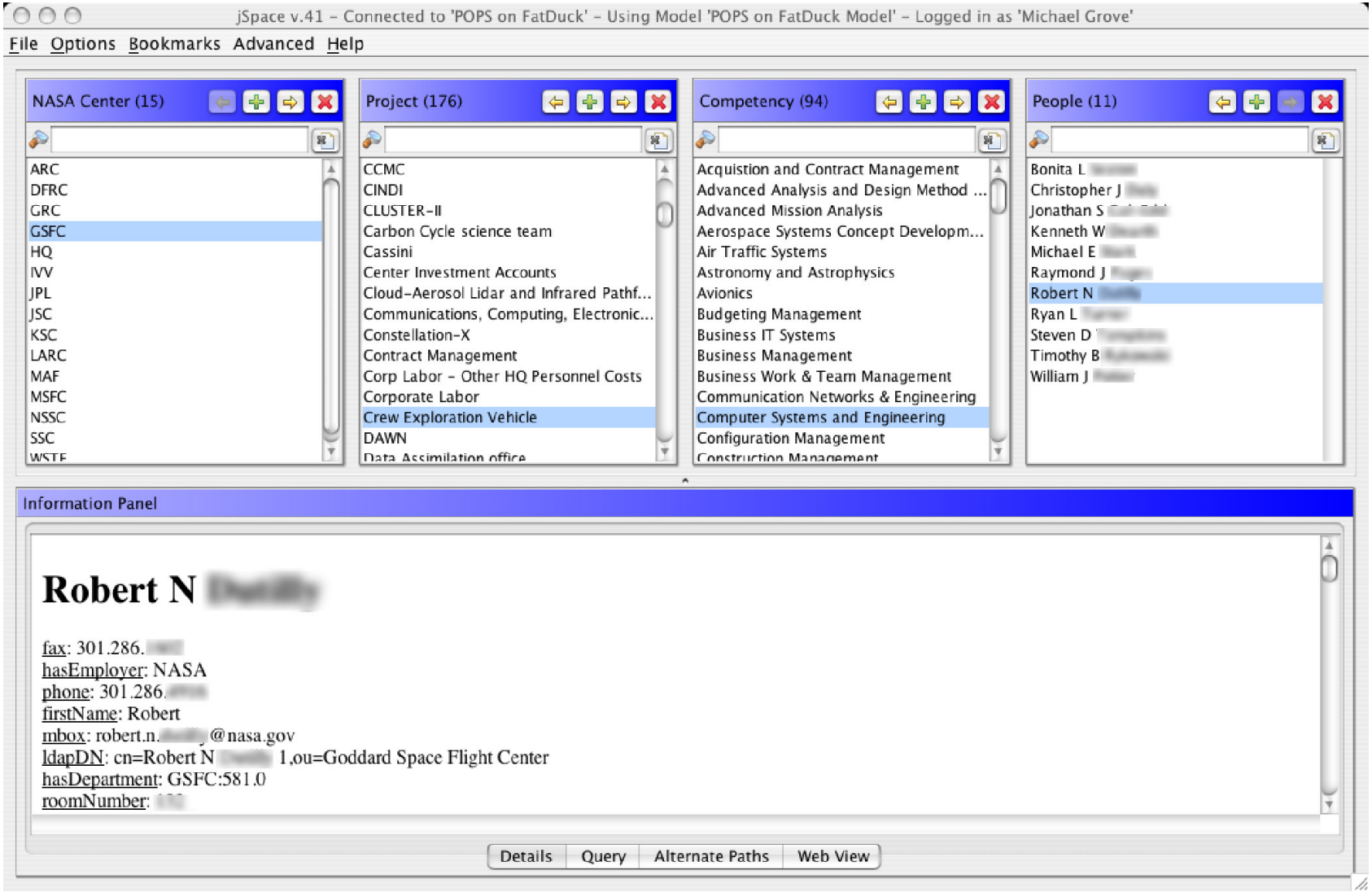
## POPS — Expertise Location Service

- Data about employees' expertise, work history, etc, is spread over various types of data stores all over the US
- Currently, finding the right person is based on a "social search", ie, personal network, contacts, etc
- POPS:
  - integrates the data over 70,000 employee and contractors using RDF
  - provides a nice user interface to search the data
  - possibly combines that with external data

*Michael Grove, Clark & Parsia, LLC, and Andrew Schain, NASA, (SWEO Case Study)*

# > Clark & Parsia and NASA

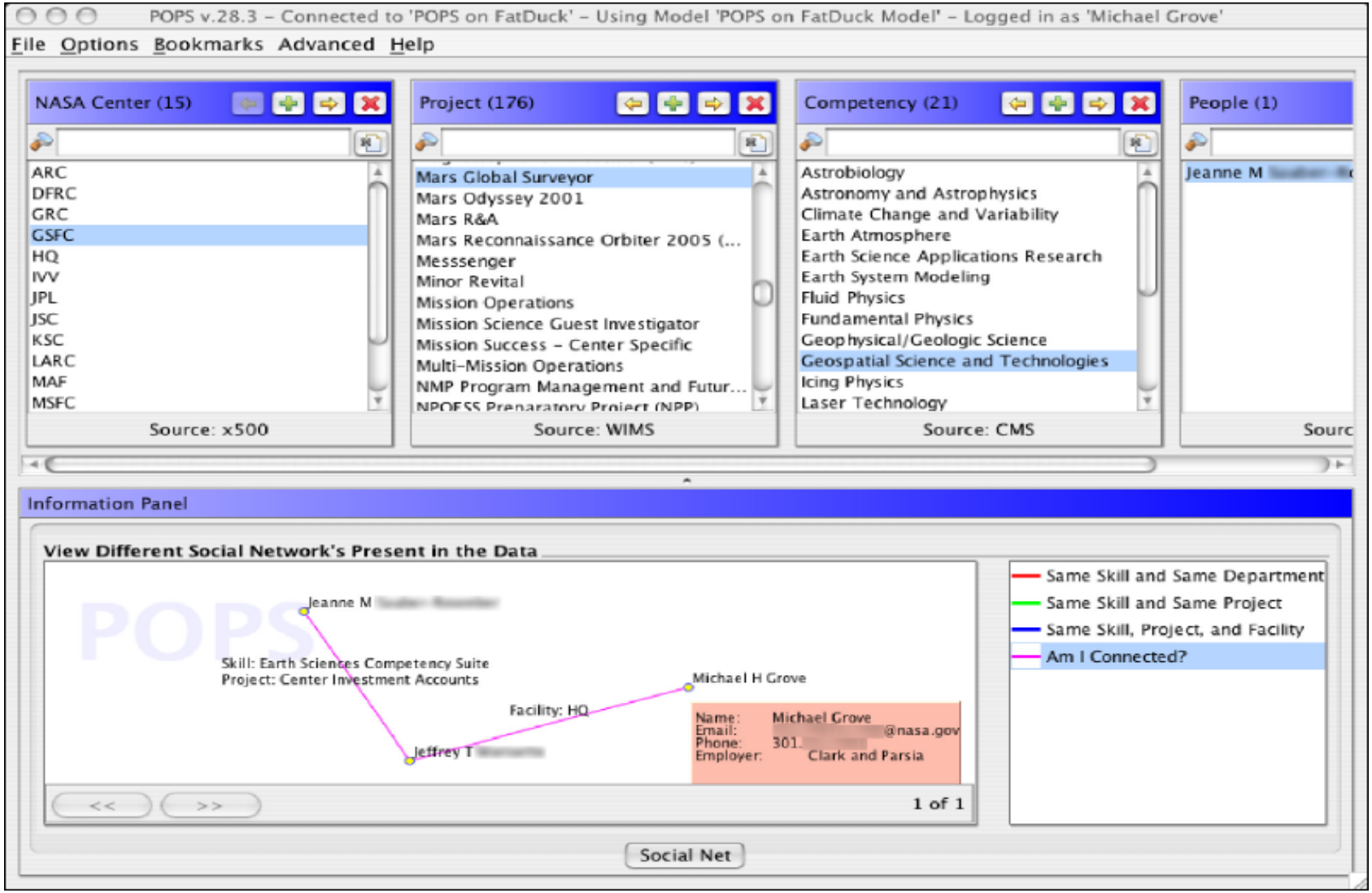
- Faceted view of the data:




*Michael Grove, Clark & Parsia, LLC, and Andrew Schain, NASA, (SWEO Case Study)*

# > Clark & Parsia and NASA

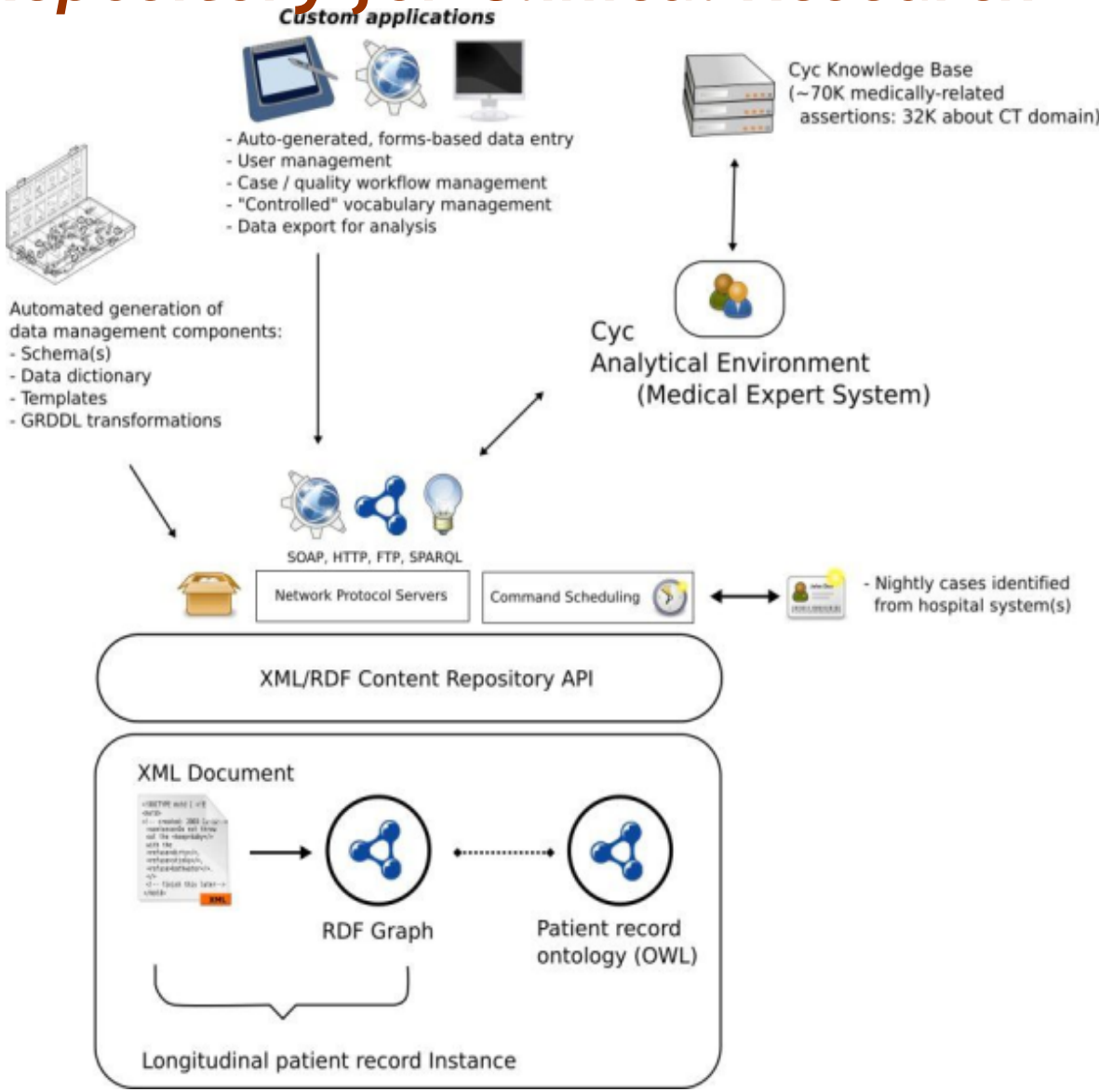
- Showing the social network:




*Michael Grove, Clark & Parsia, LLC, and Andrew Schain, NASA, (SWEO Case Study)*

# A Semantic Web Content Repository for Clinical Research

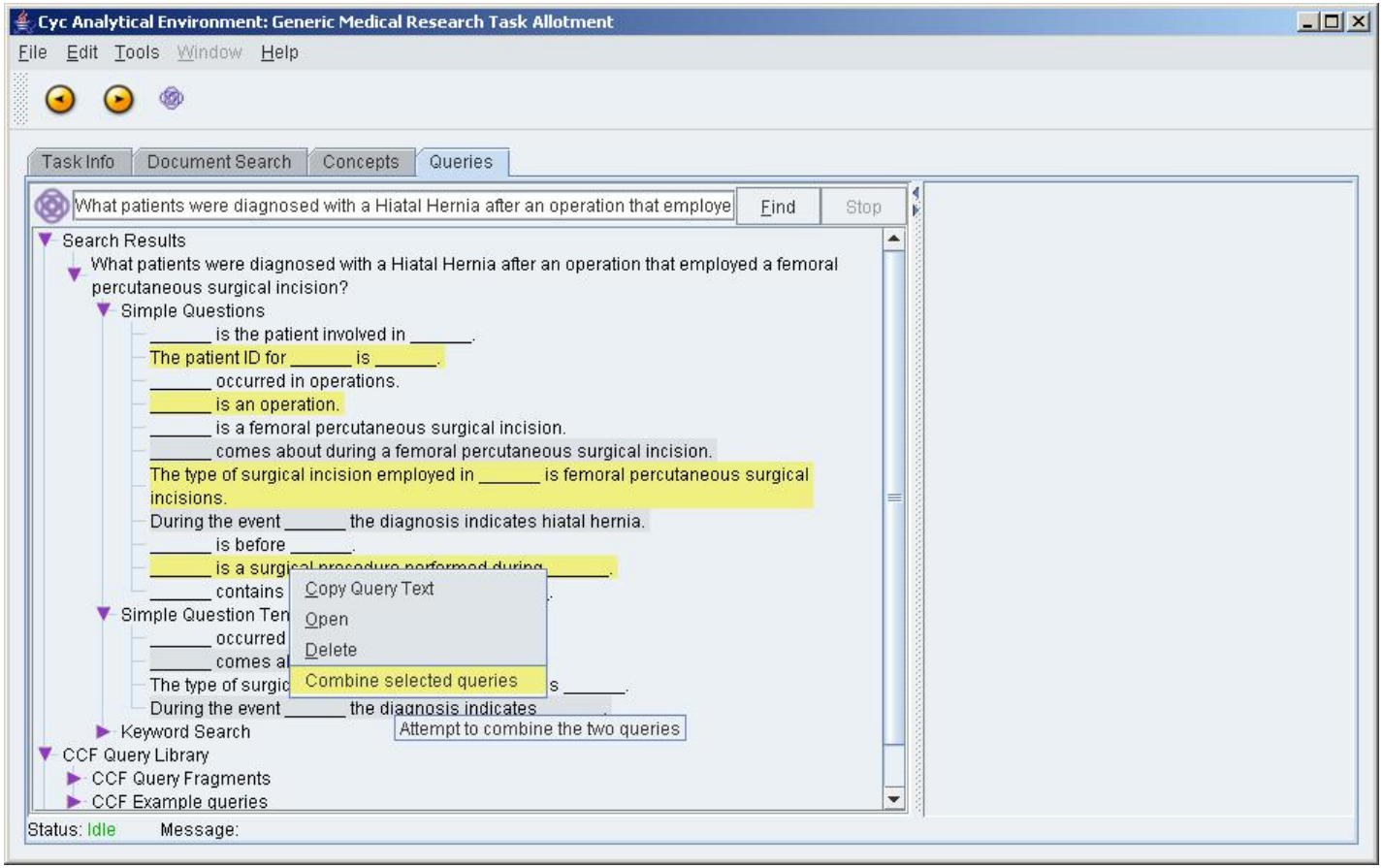
- Goal: use patients' data (too) to generate new knowledge
- Unified repository collects and stores various data
- Usage of OWL and rules allow high level operations on the data




*Courtesy of Chimezie Ogbuji, ClevelandClinic, (SWEO Case Study)*

# > Cleveland Clinic

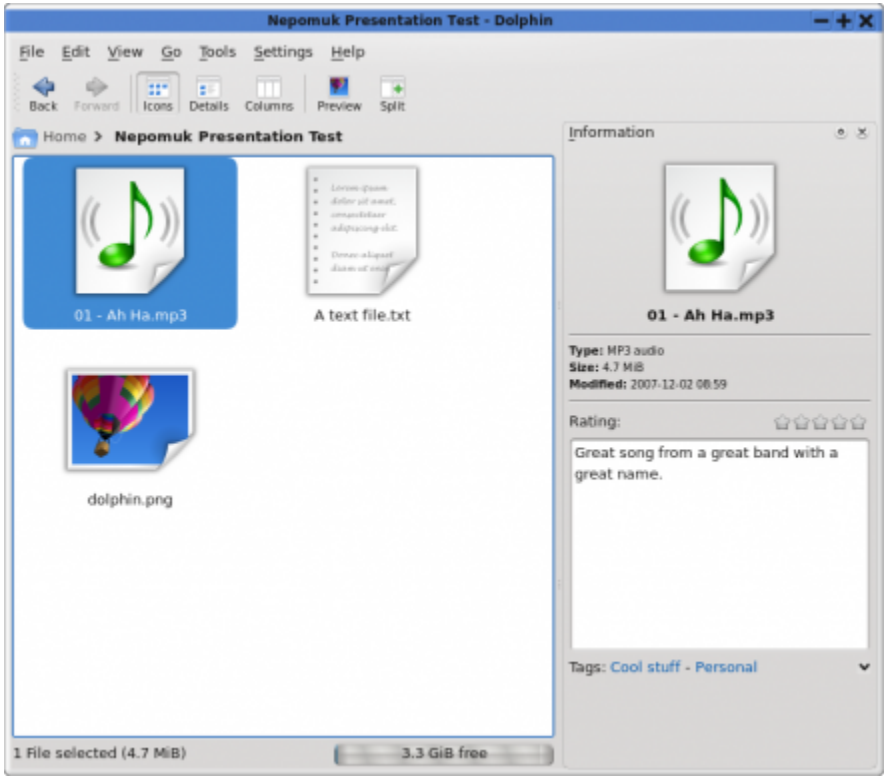
- A specialized query interface provides SPARQL access to the data
- Dataset mostly on cardiovascular diseases




*Courtesy of Chimezie Ogbuji, ClevelandClinic, (SWEO Case Study)*

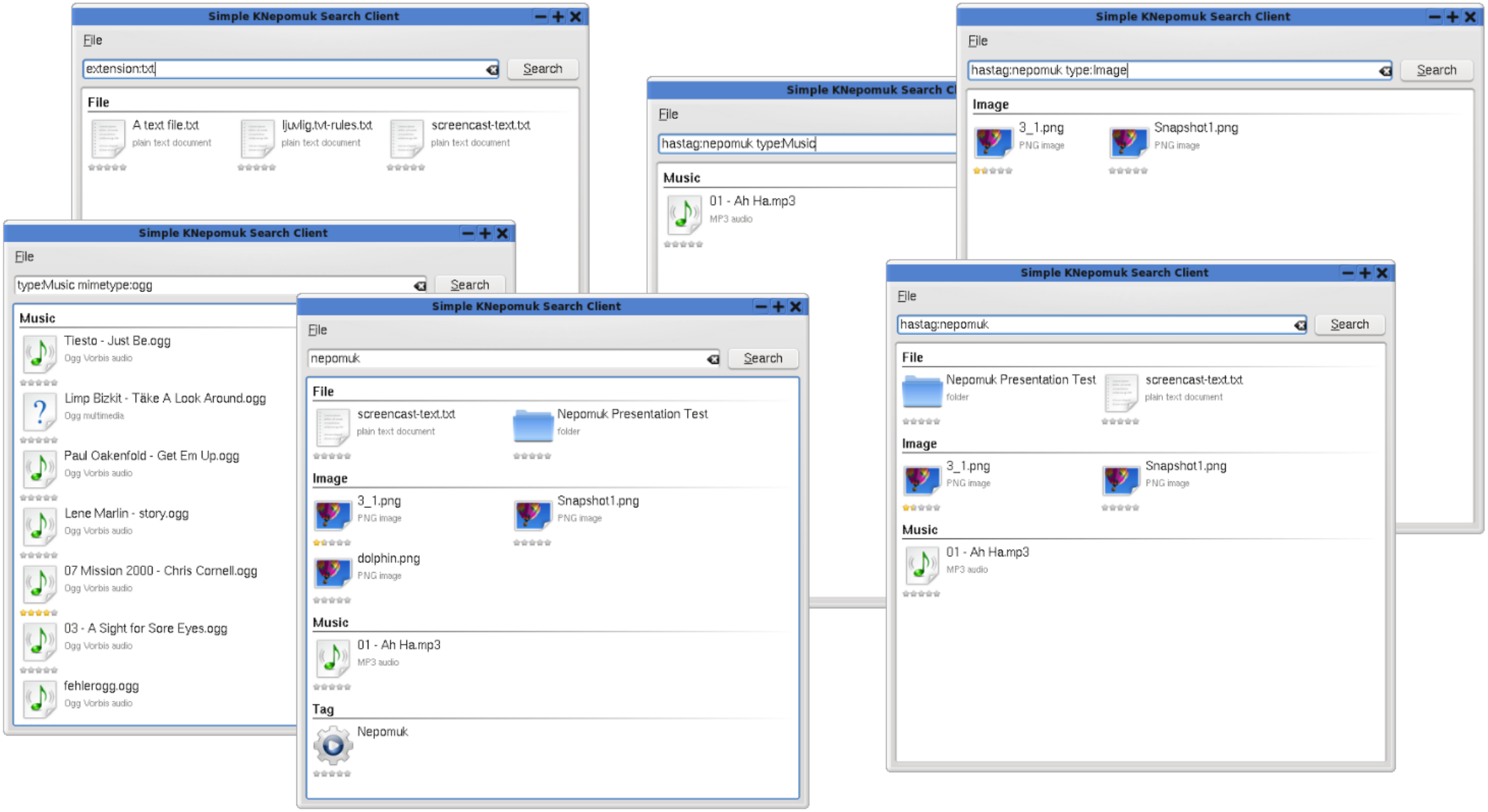
## KDE 4.0 Semantic Desktop Search and Tagging

- Metadata backend fully based on RDF, RDFS, and OWL
- Each file can be tagged, rated, commented, annotated, and automatically indexed (independently of the file format)
- Queries are made via the combination of all those
- Applications can add their own vocabulary




*Courtesy of Leo Sauermann, DFKI, and Sebastian Trüg, Mandriva Linux (SWEO Case Study)*

# > Nepomuk Project

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# > Talis and Univ. Plymouth

## *A Linked Open Data Resource List Management Tool for Undergraduate Students*

- Integration of experience and data in the planning and operation of deep sea drilling processes
- Discover relevant experiences that could affect current or planned drilling operations
  - uses an ontology backed search engine

*Courtesy of Chris Clarke, Talis [(SWEO Case Study)]*

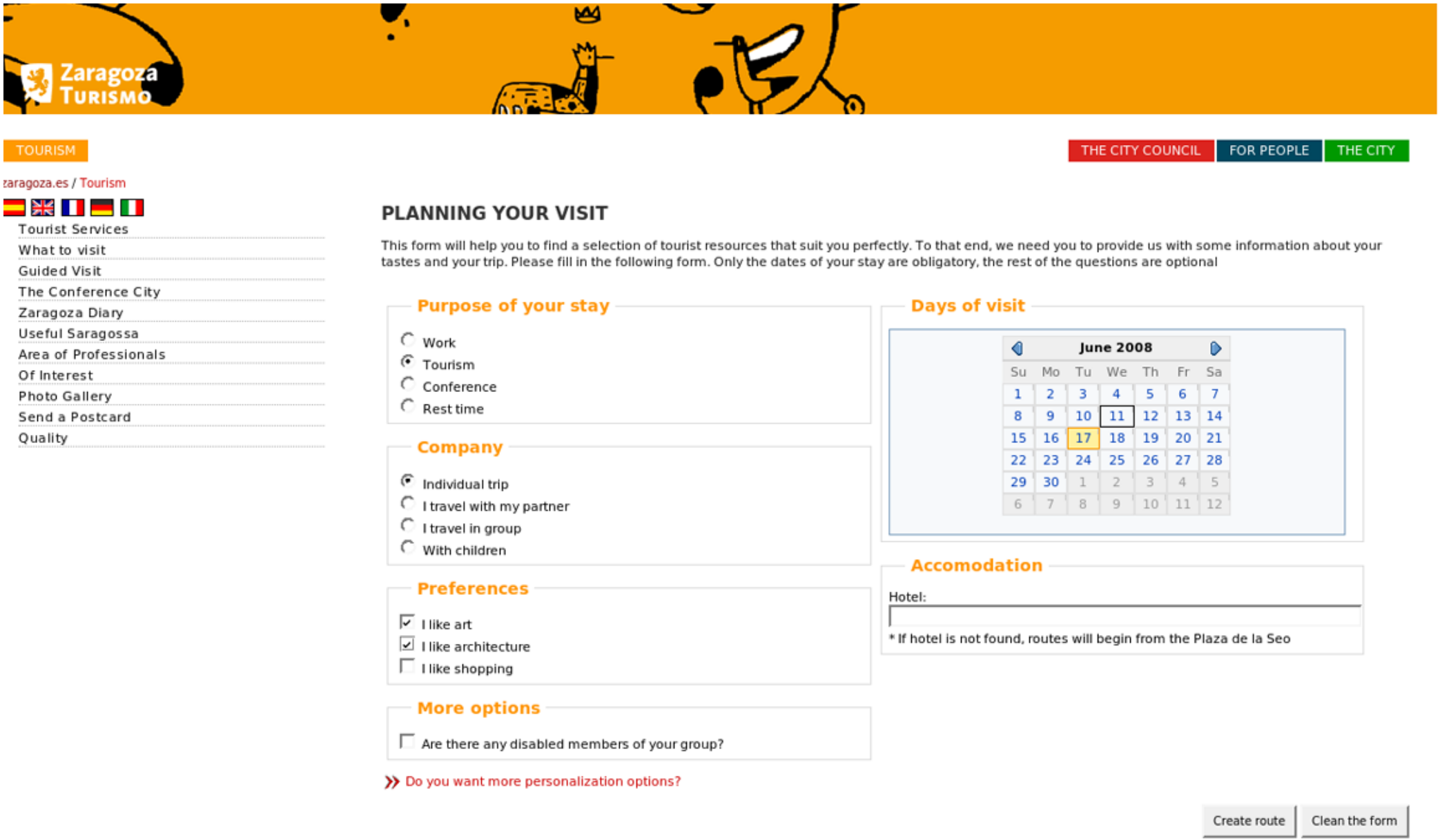
# > Municipality of Zaragoza and CTIC

## *Semantic matchmaking for eTourism in the city of Zaragoza*

- Portal to help tourists in planning their city tour based on their personal profile
  - integration (via RDF and ontologies) of different data sources (points of interest, data on events, photos, maps)
  - visitors' preferences are translated into rules on the RDF data
  - a planning algorithm is run to produce recommendations for the user

*Courtesy of Maria Jesús Fernández, Zaragoza, and Antonio Campos, CTIC (SWEO Case Study)*

# > Municipality of Zaragoza and CTIC

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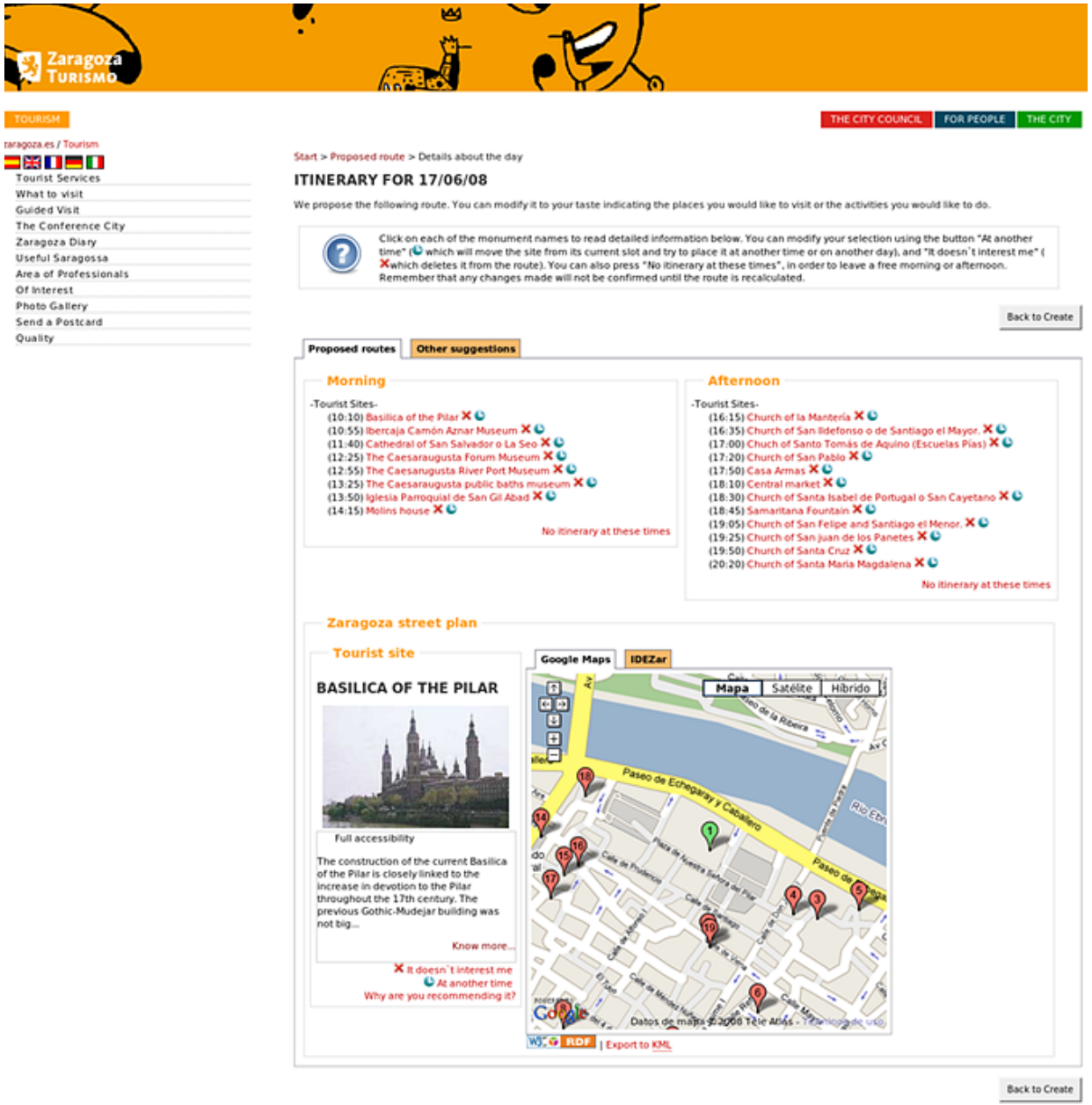


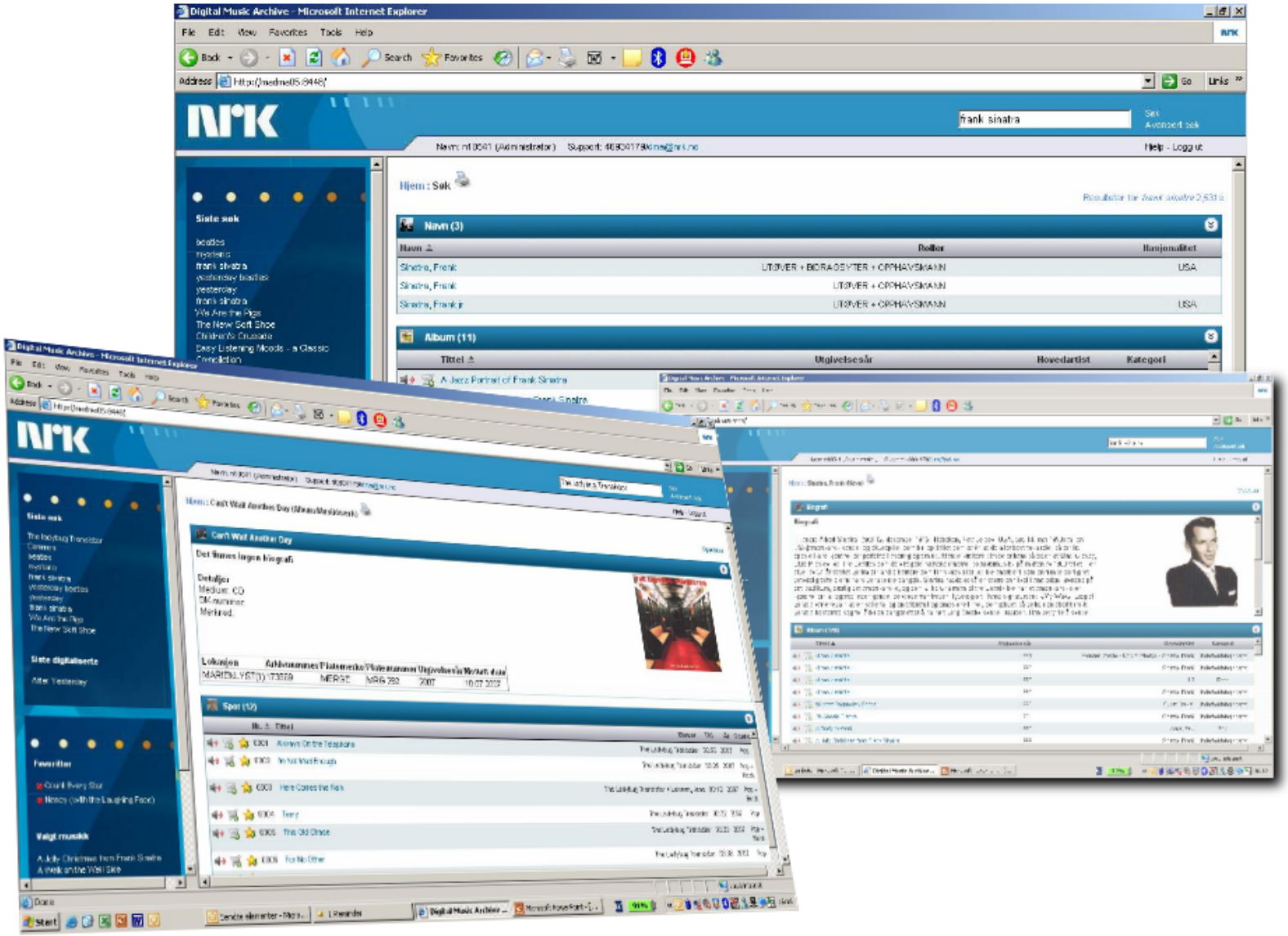

*Courtesy of Maria Jesús Fernández, Zaragoza, and Antonio Campos, CTIC [(SWEO Case Study)]*

## *Digital Music Archive*

- Digitize the huge music material at the Norwegian Natioanal Broadcaster (NRK)
- Use the repository asset in new productions, with better search and access
- Semantic Web is used to manage the huge amount of metadata, and provide easy and quick access to the asset
  - reuse the existing, mostly paper based catalog entries

*Courtesy of Robert Engels, ESIS, and Jon Roar Tønnesen, NRK (SWEO Case Study)*

# > ESIS & NRK



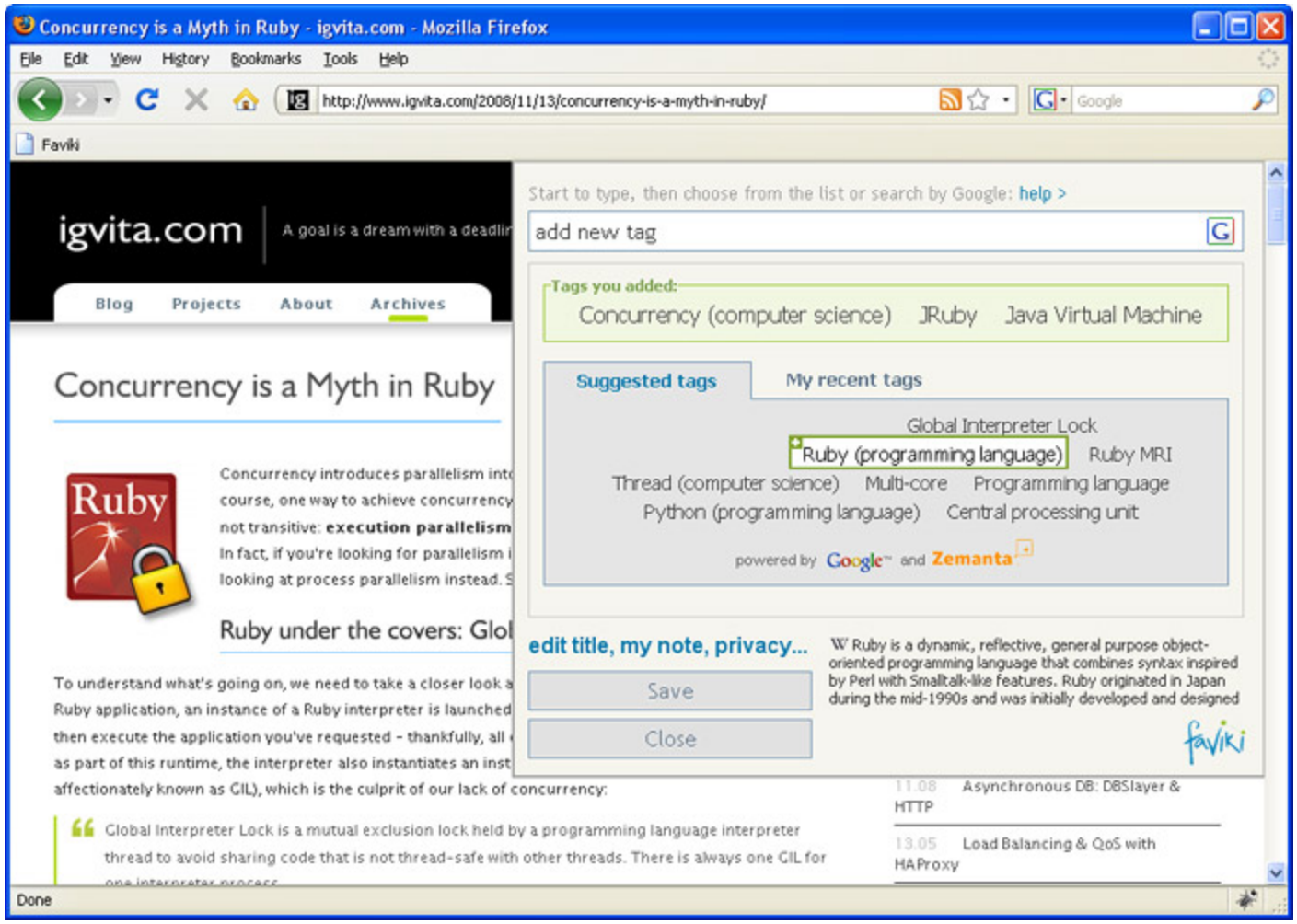

*Courtesy of Robert Engels, ESIS, and Jon Roar Tønnesen, NRK (SWEO Case Study)*

## *Semantic Tags*

- Social bookmarking system (a bit like del.icio.us) but with a controlled set of tags
  - tags are terms extracted from Wikipedia/DBpedia
  - tags are categorized using the relationships stored in DBpedia
  - tags can be multilingual, DBpedia providing the linguistic bridge
- The tagging process itself is done via a user interface hiding the complexities

*Courtesy of Vuk Milicic,Faviki (SWEO Case Study)*

# > Faviki



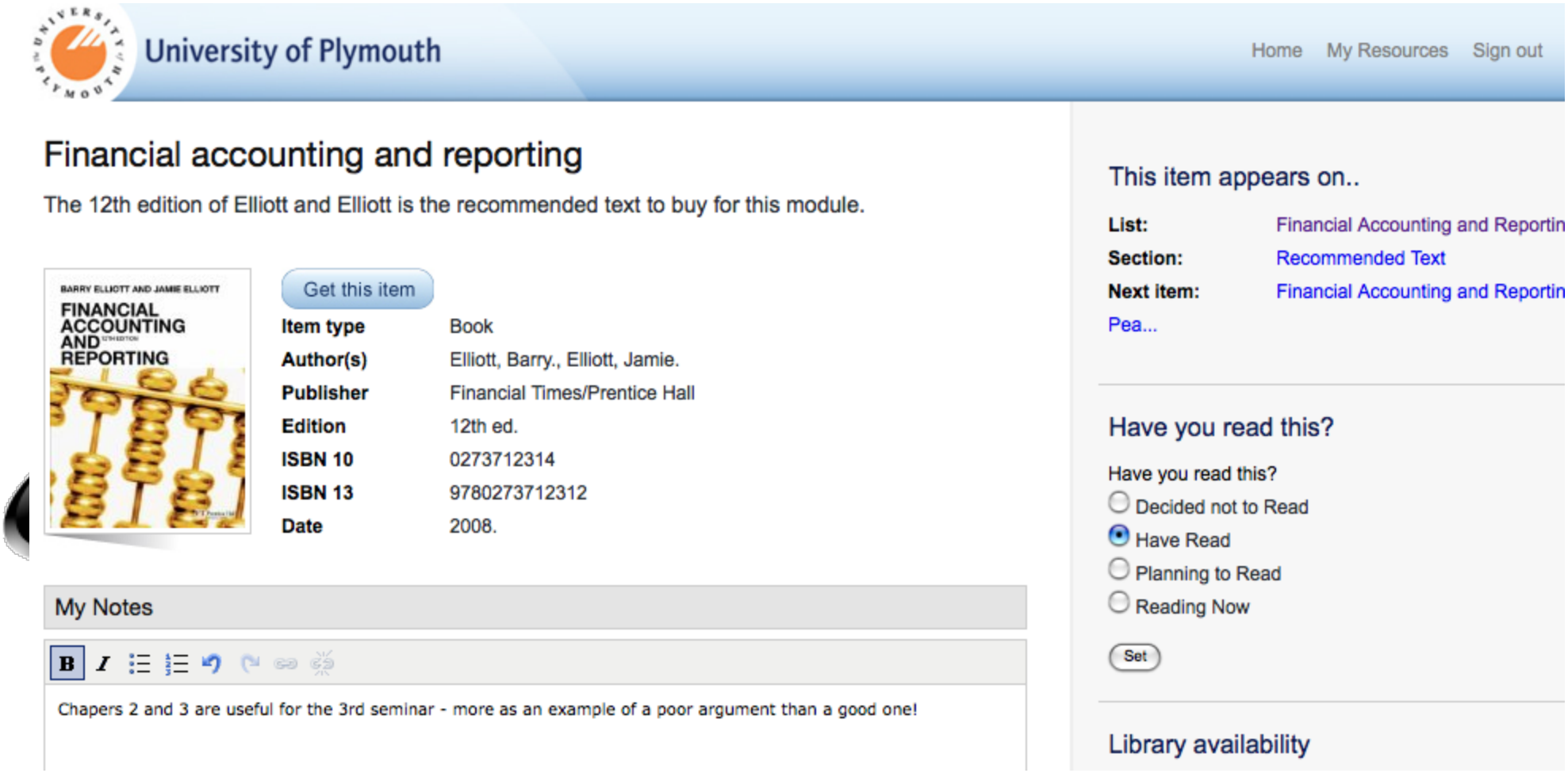

*Courtesy of Vuk Milicic,Faviki [(SWEO Case Study)]*

# *A Linked Open Data Resource List Management Tool for Undergraduate Students*

- Managing “resource lists” (“course reserves”): collections of resources (books, articles, a/v content, etc) as a companion for students
- Resources, relations, annotations, etc, are stored as RDF data
  - using public vocabularies to manage them
- Flexible user interface is provided to manage, manipulate, (individually) annotate
- Easy update against changing environments (eg, change in the library’s subscriptions)

*Courtesy of Chris Clarke, Talis, and Fiona Greig, University of Plymouth [(SWEO Case Study)]*

# > Talis and Univ. of Plymouth




- used by over 20,000 students in Plymouth already, other UK universities to come…

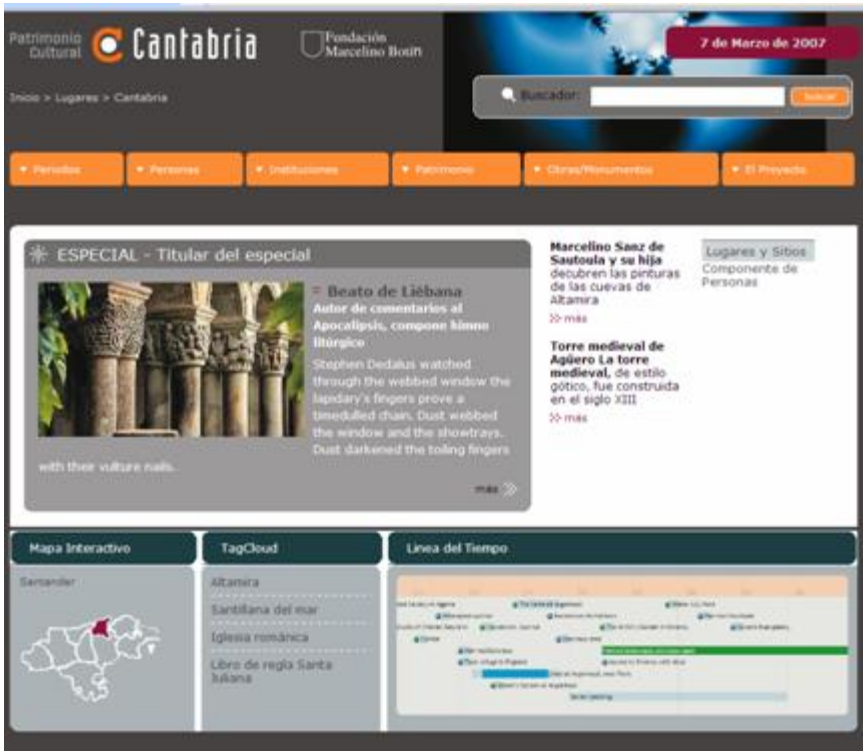
*Courtesy of Chris Clarke, Talis, and Fiona Greig, University of Plymouth [(SWEO Case Study)]*

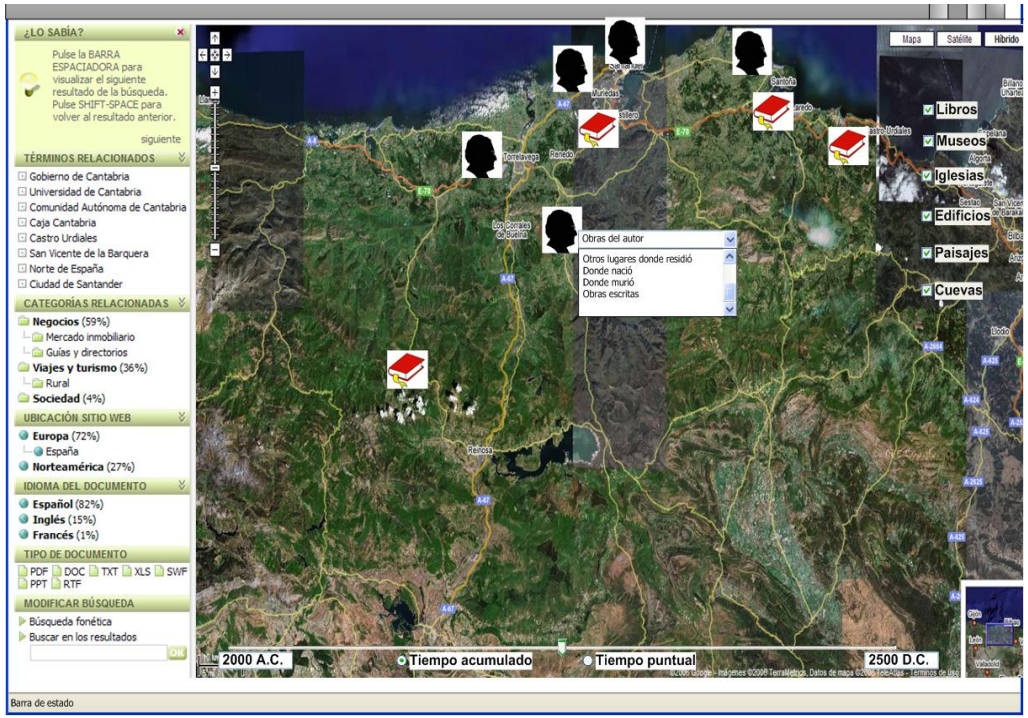
## *An Ontology of Cantabria's Cultural Heritage*

- Semantic portal for cultural heritage based on
  - a specialized ontology (based on various standards)
  - integration of various data, digitized assets, etc, populating the portal based on the ontology
  - rich navigation based on the ontology, interactive maps, etc.

*Courtesy of Francisca Hernández, Fundación Marcelino Botín, and Richard Benjamins, iSOCO, (SWEO Case Study)*

# > Fundación Marcelino Botín



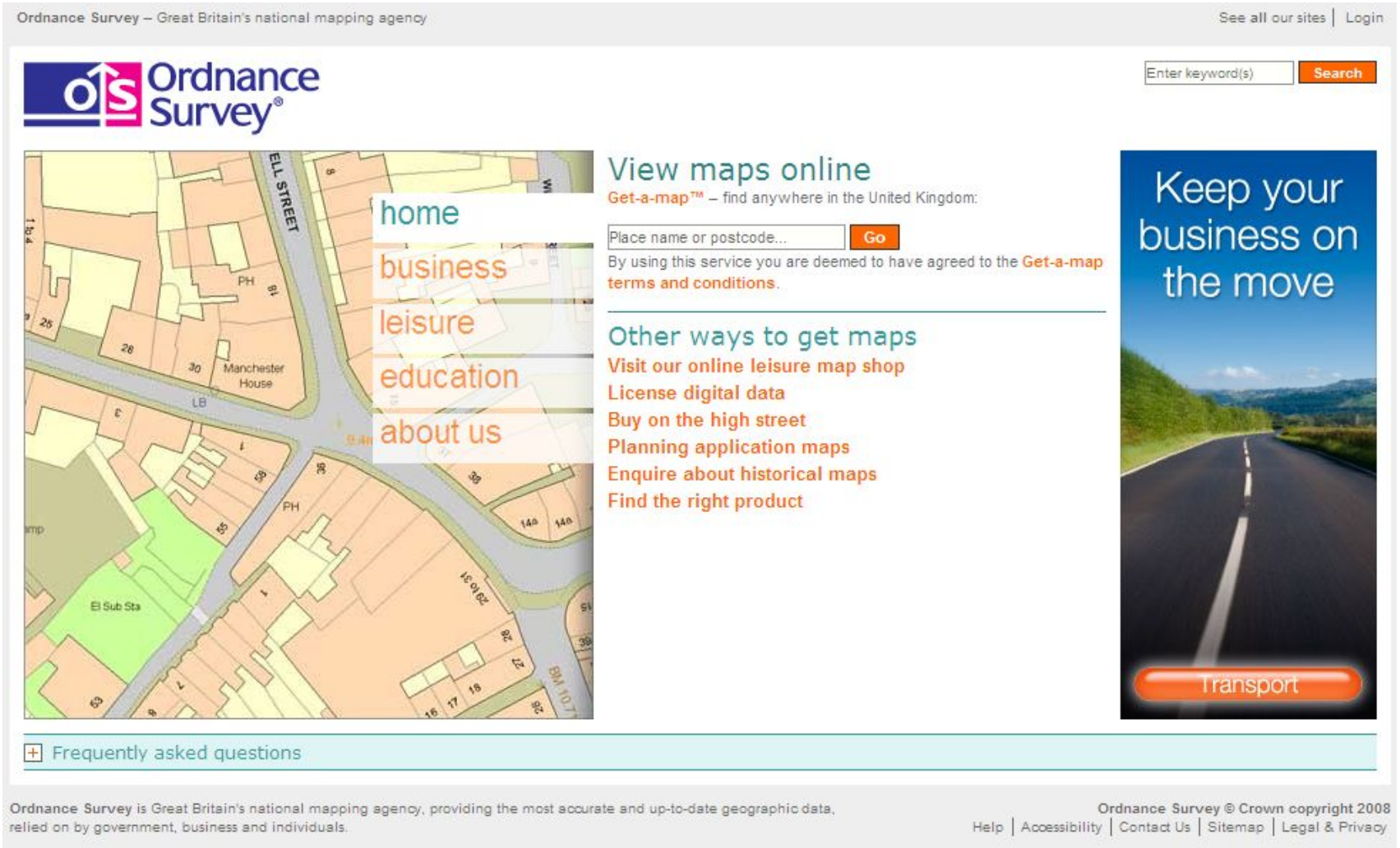

*Courtesy of Francisca Hernández, Fundación Marcelino Botín, and Richard Benjamins, iSOCO, (SWEO Case Study)*

## Geographic Referencing Framework

- OS maintains a definitive mapping data of Great Britain (used by the public and private sector)
- Integrates different, semantically diverse sources of data
- Develops general ontologies (eg, Hydrology, Administrative Geography, Buildings and Places, etc) to bridge differences
- Efficient queries via the ontology (or directly in RDF)
- Advantages include efficient data integration, data repurposing, better quality control and classification

*Courtesy of Catherine Dolbear, Ordnance Survey, (SWEO Case Study)*

# > Ordnance Survey




*Courtesy of Catherine Dolbear, Ordnance Survey, (SWEO Case Study)*

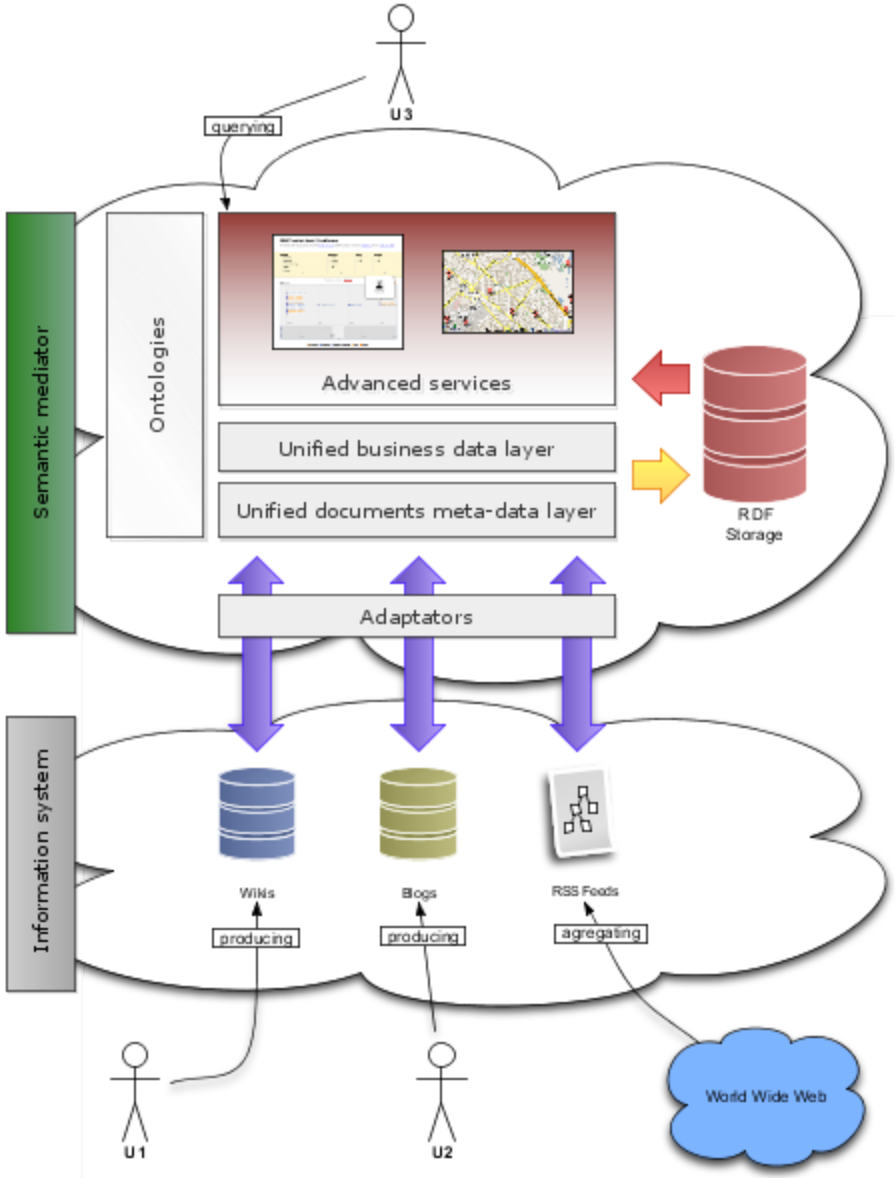
# > EDF R&D and Université Paris-Sorbonne

## *Enhancement and Integration of Corporate Social Software Using the Semantic Web*

- Integration of “social” software within the R&D department (wikis, blogs, tagging, RSS, etc)
  - integration based on RDF and commonly used vocabularies and data (SIOC, Dublin Core, Geonames, FOAF, SKOS)
  - developed plugins for, eg, wiki, to include RDF data automatically
  - tagging service to bind tags to URI-s of SW resources (eg, from DBpedia, geonames, etc)
- Users sees an integrated set of knowledge, without knowing about Semantic Web…

*Courtesy of Alexandre Passant, EDF R&D and LaLIC, Université Paris-Sorbonne, (SWEO Case Study)*

# > EDF R&D and Université Paris-Sorbonne



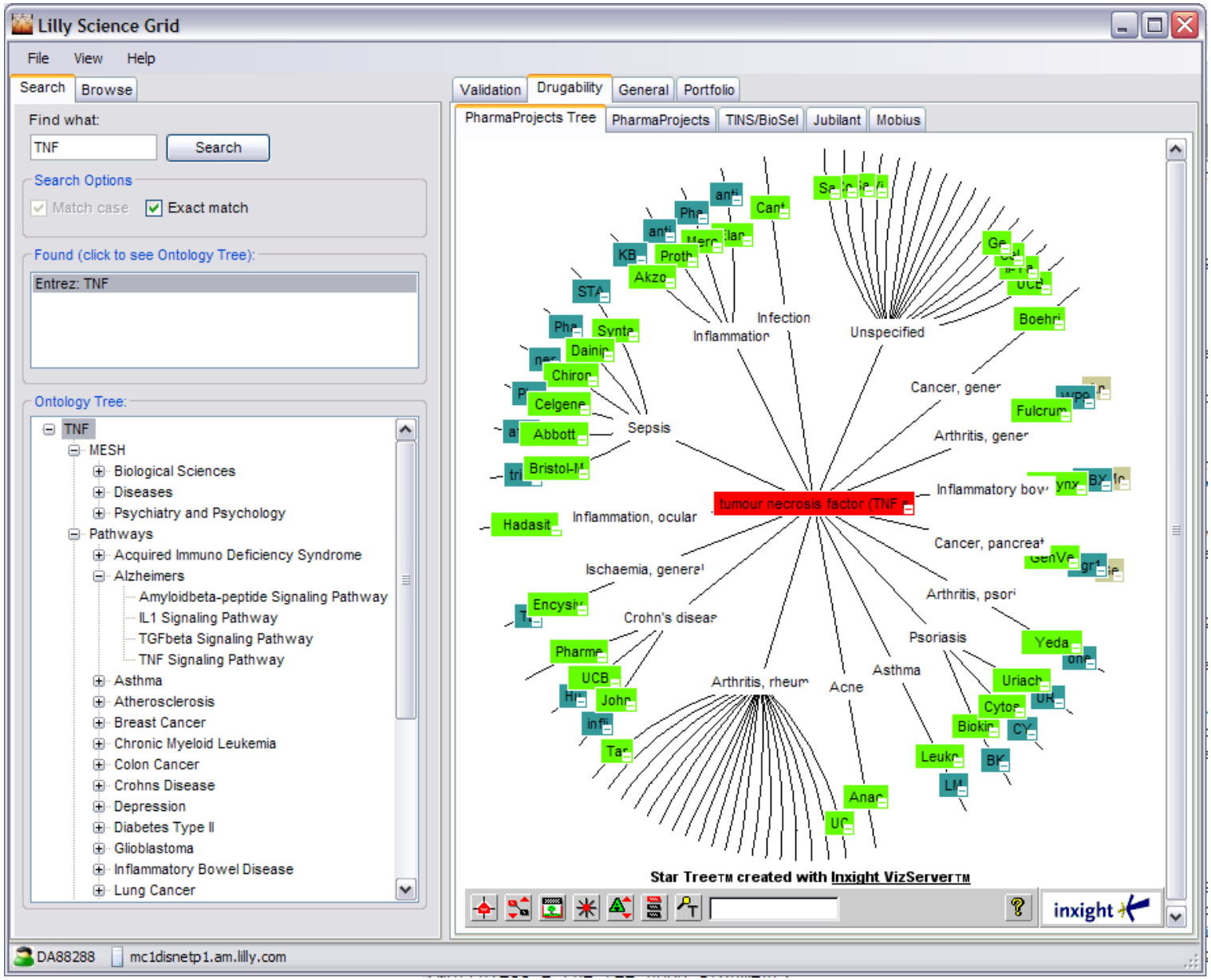

*Courtesy of Alexandre Passant, EDF R&D and LaLIC, Université Paris-Sorbonne, (SWEO Case Study)*

# *Prioritization of Biological Targets for Drug Discovery*

- Better prioritization of possible drug targets, based on
  - integrating large diversity of data,
    - electronic patient records, chemical structures, biological sequences, images, biological pathways, scientific papers,…
  - usage public and internal ontologies
- A search engine (“Target Assessment Tool”) is built to assist researchers

*Courtesy of Susie Stephens, Eli Lilly (SWEO Case Study)*

# > Eli Lilly




*Courtesy of Susie Stephens, Eli Lilly (SWEO Case Study)*

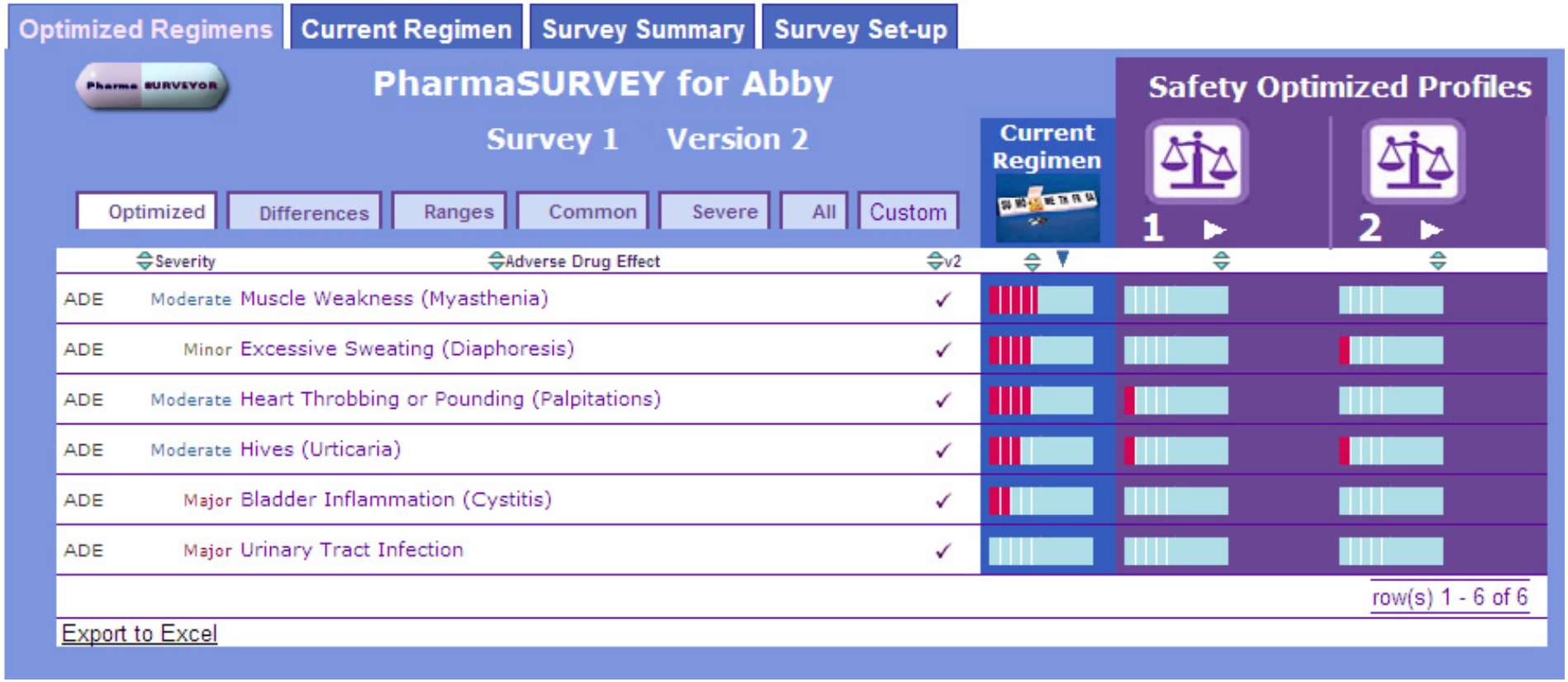
# > PharmaSURVEYOR, Inc.

## *Composing Safer Drug Regimens for the Individual Patient using Semantic Web Technologies*

- Help in finding the best drug regimen for a specific case
  - find the best trade-off for a patient
- Use an ontology for medical conditions, signs, symptoms
- Integrate data from various sources (patients, physicians, Pharma, researchers, etc)

*Courtesy of Erick Von Schweber, PharmaSURVEYOR Inc., (SWEO Use Case)*

# > PharmaSURVEYOR, Inc.




- Different “profiles” are provided with various risk factors
- It is more than just pure search…

*Courtesy of Erick Von Schweber, PharmaSURVEYOR Inc., (SWEO Use Case)*

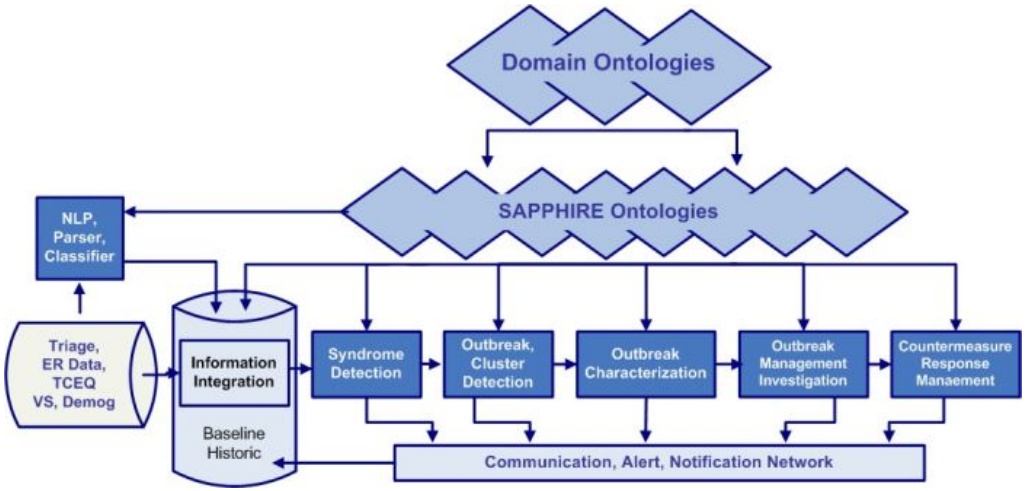
## *Public Health Situation Awareness*

- SAPPHIRE: an integrated biosurveillance system; integrates data from multiple disparate sources
- Data can be viewed from many different perspectives (disease surveillance, environmental protection, biosecurity and bioterrorism, veterinary surveillance, etc.)
- New information absorbed easily (eg, it had a successful use during the Katrina disaster)
- Advantages include dynamic adaptability, usage of disparate and heterogeneous data

*Courtesy of Parsa Mirhaji, School of Health Information Sciences, University of Texas (SWEO Case Study)*

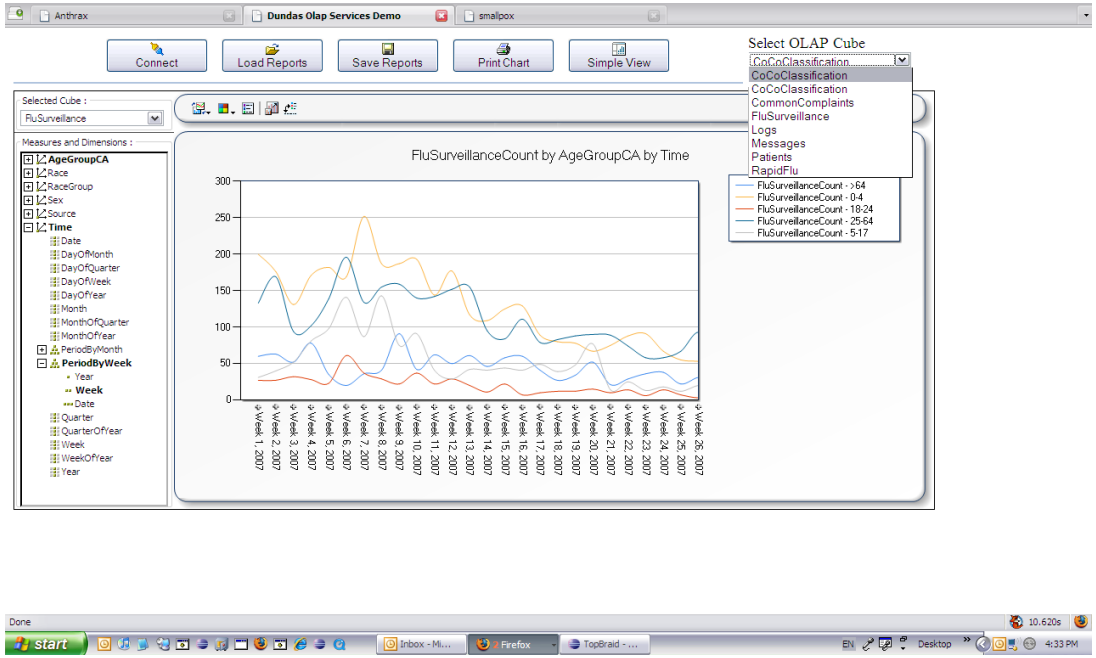
# > University of Texas






SAPPHIRE's structure

SAPPHIRE's user interface




*Courtesy of Parsa Mirhaji, School of Health Information Sciences, University of Texas (SWEO Case Study)*

## *Improving the Reliability of Search Results*

- Content labels: metadata with extra information (in RDF) on search results (eg, suitability for mobile devices, disabled users or children)
- Segala's Search Thresher extension can: (1) process search results, trying to locate a content label file and (2) highlight pages that contain a content label file with additional information displayed
- More trust and warning on search results; with proper settings, results can be filtered along various criteria

*Courtesy of David Rooks, Segala, (SWEO Case Study)*

# > Segala

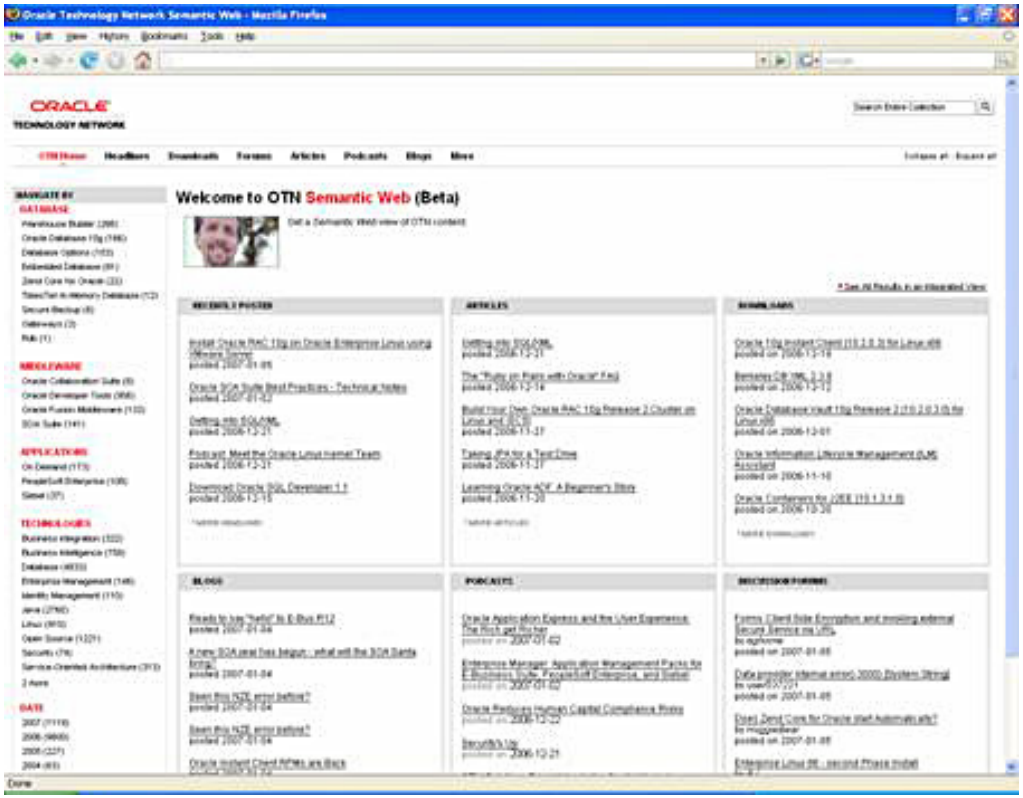
*Courtesy of David Rooks, Segala, (SWEO Case Study)*

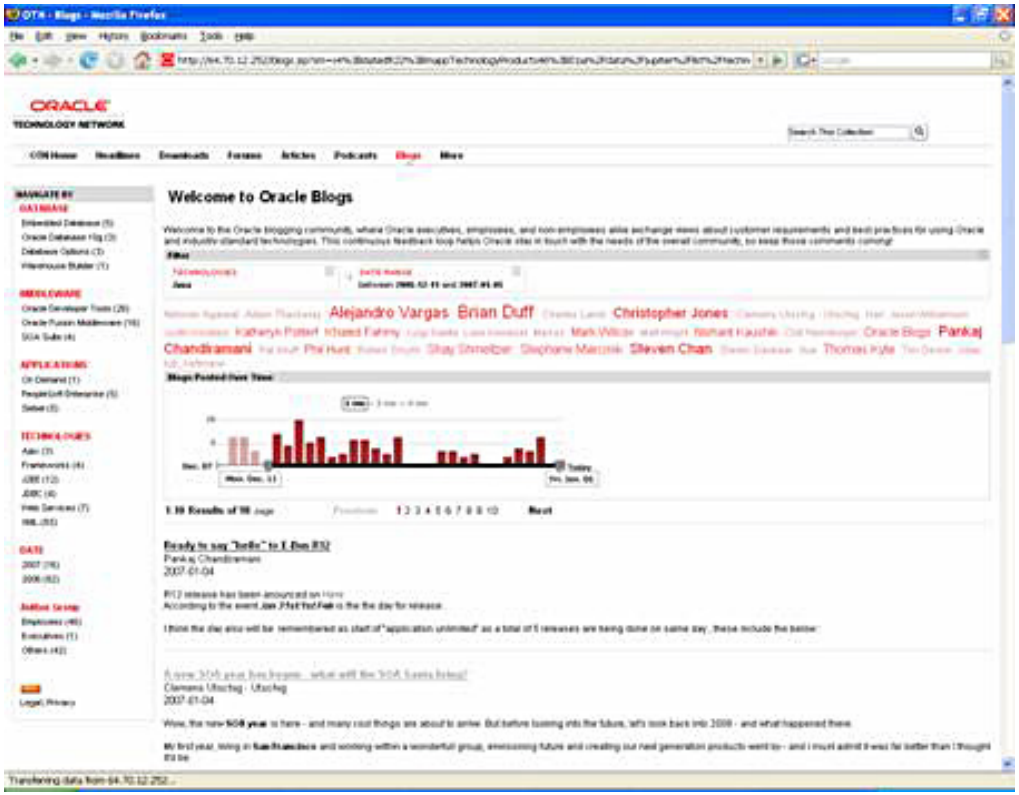
## *Enhancing Content Search*

- Oracle Technology Network (OTN) aggregates many sources of content through a single portal
- Various feeds are pulled, Oracle's taxonomy is used for additional annotation
- Ontologies make it possible to re-group related items; leads to more comprehensible search results and to narrow search
- Advantages include enhanced search and navigation, better user interface, better queries through SPARQL

*Courtesy of Mike DiLascio, Siderean Software, and Justin Kestelyn, Oracle Corporation (SWEO Case Study)*

# > Siderean Software & Oracle

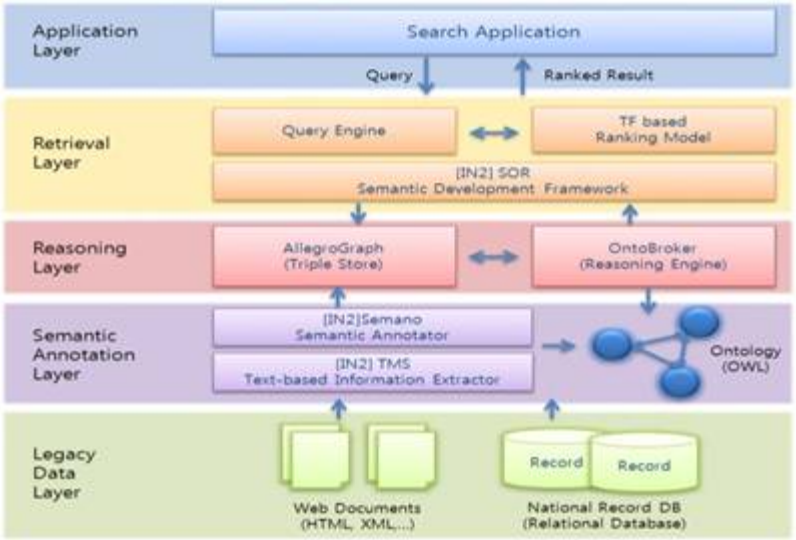



*Courtesy of Mike DiLascio, Siderean Software, and Justin Kestelyn, Oracle Corporation (SWEO Case Study)*

## *Semantic MDR and IR for National Archives*

- Metadata infrastructure for the documents in the National Archives of Korea (70 million national records)
  - text mining + ontologies to build up the metadata
  - over 12 million metadata statements stored in a specialized RDF datastore
- Information retrieval engine combine the metadata structures with rules




*Courtesy of Tony Lee, Jin Woo Kim, and Bok Ju Lee, Saltlux, Kyu Hyup Kim, Yoon Jung Kang, NAK (SWEO Case Study)*

# > Saltlux & National Archives Korea

*Courtesy of Tony Lee, Jin Woo Kim, and Bok Ju Lee, Saltlux, Kyu Hyup Kim, Yoon Jung Kang, NAK (SWEO Case Study)*

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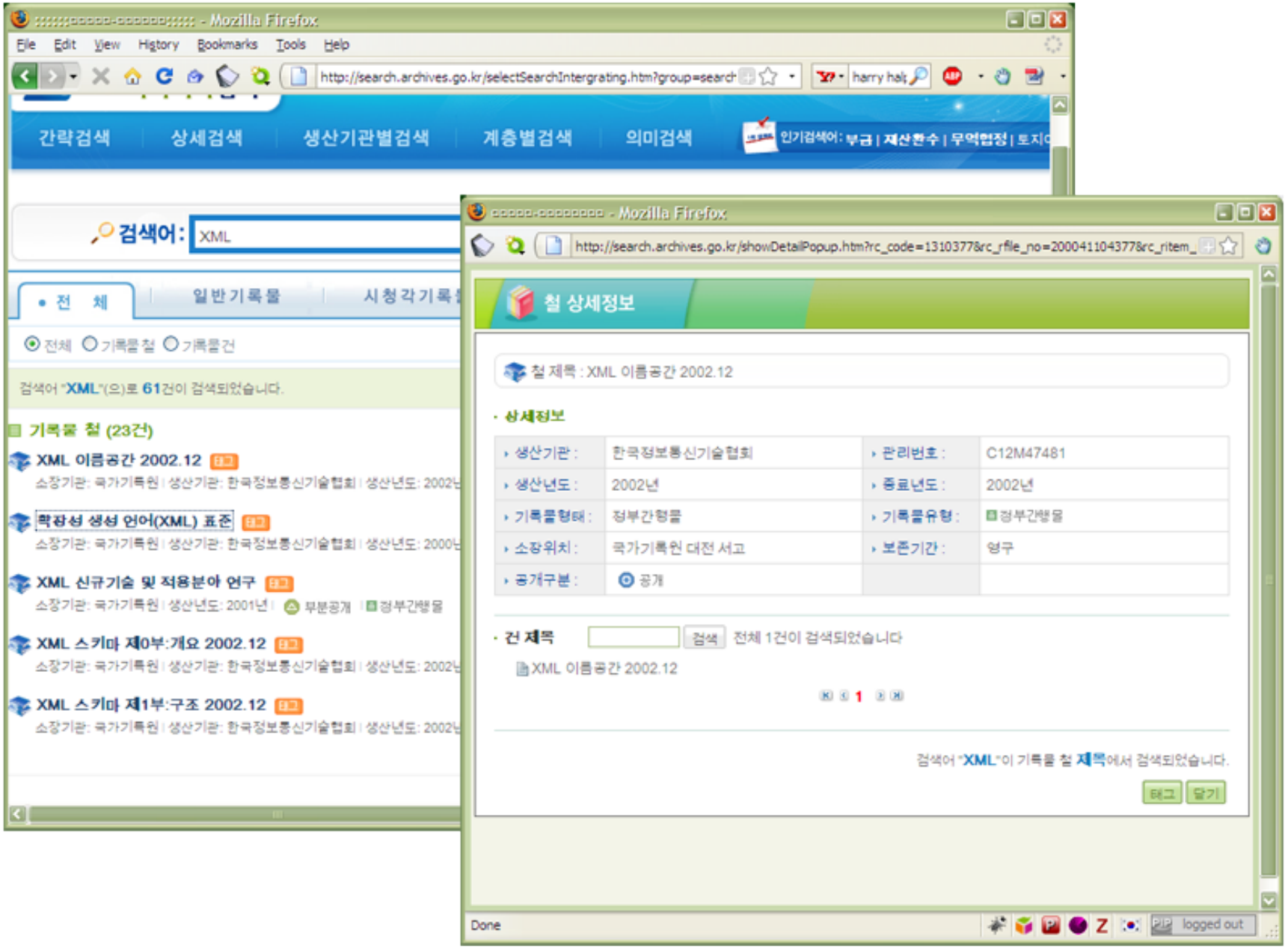



*Courtesy of Tony Lee, Jin Woo Kim, and Bok Ju Lee, Saltlux, Kyu Hyup Kim, Yoon Jung Kang, NAK (SWEO Case Study)*

# > Sun Microsystems and Zepheira

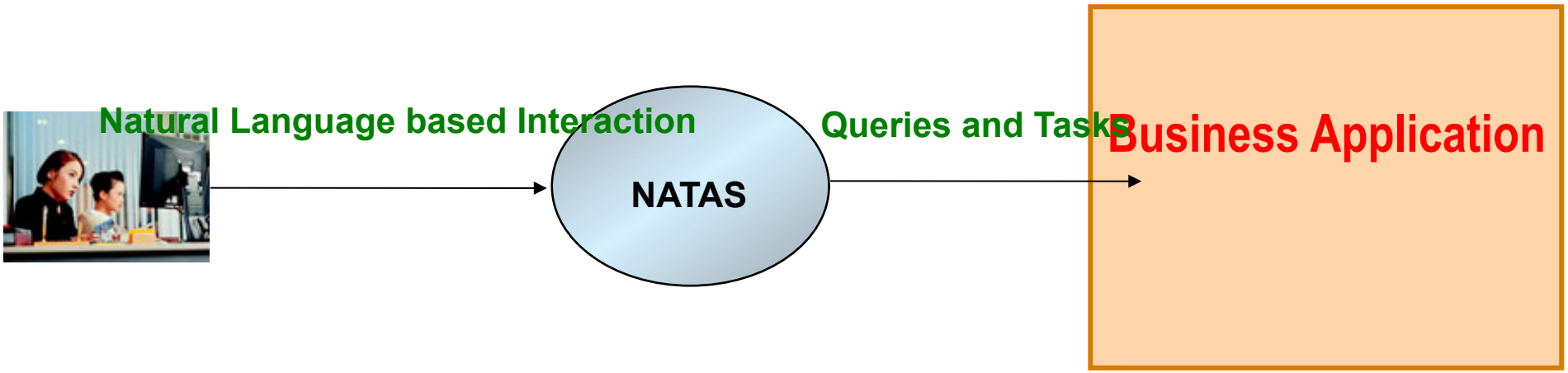
## *The swoRDFish Metadata Initiative: Better, Faster, Smarter Web Content*

- Management of Sun's corporate product web site:
  - data management tools are used to create, classify, and manage resources and their relationships
  - Sun's content management system import resource Ids; web publishers assign as metadata to their content
  - Web sites built dynamically and auto assembled to include lists of related informations, services, technologies, etc

*Courtesy of Susie Cone, Sun Microsystems, Inc., and Kathy MacDougall, Zepheira (SWEO Case Study)*

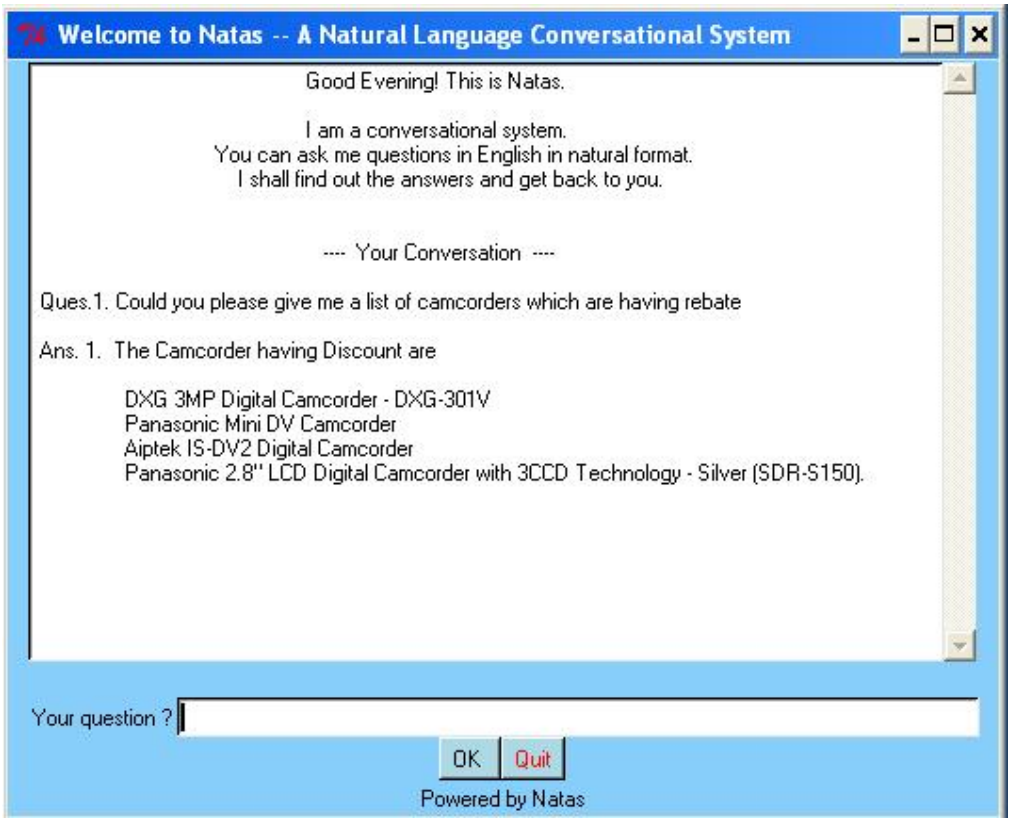
# *Natural Language Interface to Business Applications*

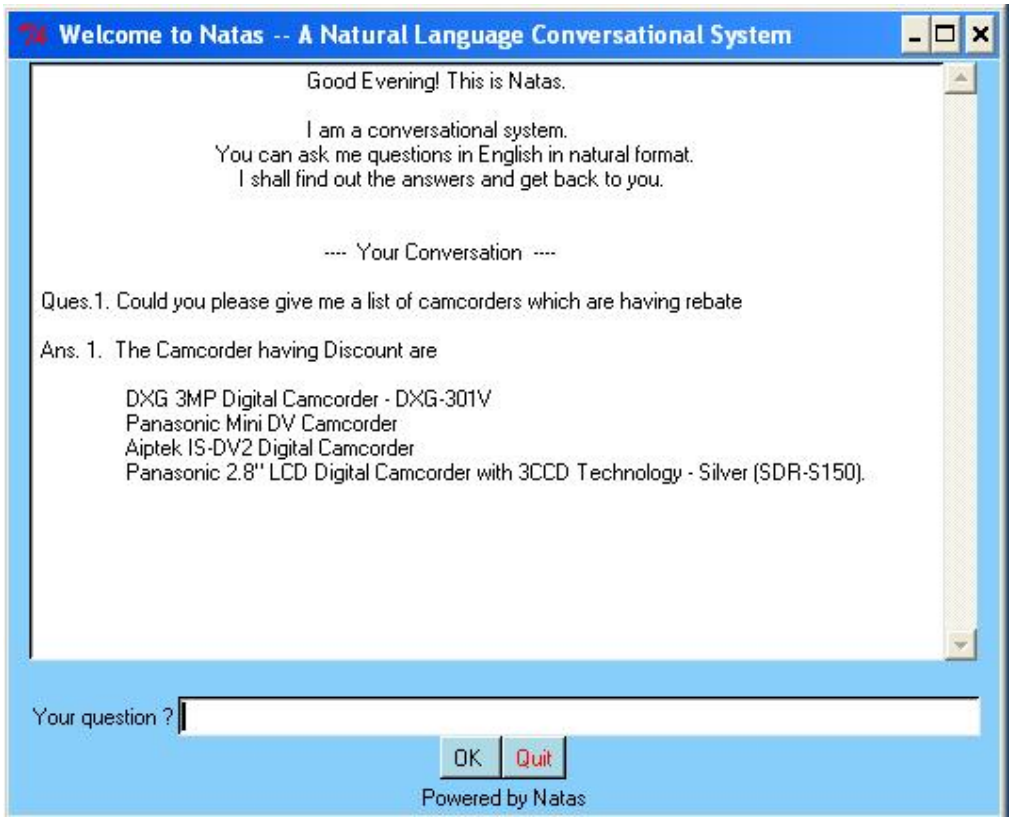
- NATAS: users interact with a business application in natural language by posing questions and invoking tasks (eg, by emails)
- A domain OWL ontology helps in the retrieval of relevant data and concepts




*Courtesy of C. Anantaram, Tata Consultancy Services Limited (SWEO Case Study)*

# > Tata Consultancy Services




*Courtesy of C. Anantaram, Tata Consultancy Services Limited [(SWEO Case Study)]*

## *Semantic Content Description to improve discovery*

- Integrate various vendors' product descriptions via RDF
  - ring tones, games, wallpapers
  - manage complexity of handsets, binary formats
- A portal is created to offer appropriate content
- Significant increase in content download after the introduction

*Courtesy of Kevin Smith, Vodafone Group R&D* *(SWEO Case Study)*

# > Municipality of Zaragoza

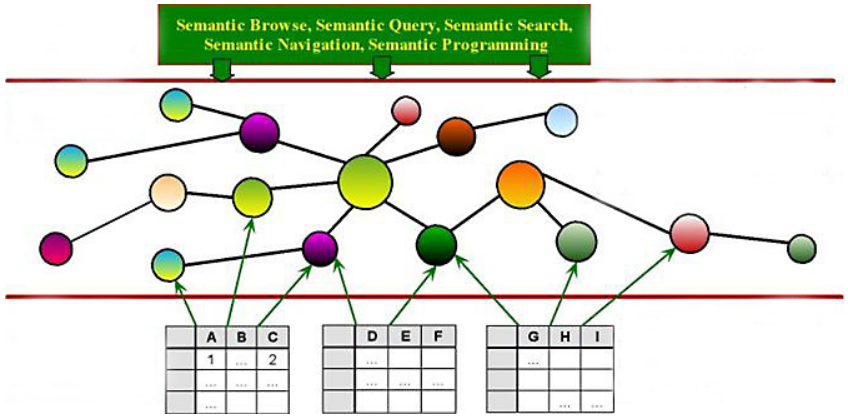
## *An Intelligent Search Engine for Online Services for Public Administrations*

- Semantic Web based search engine for public services
- The search is based on natural language processing and ontological reasoning

*Courtesy of Jesús Fernando Ruíz, Municipality of Zaragoza* *(SWEO Use Case)*

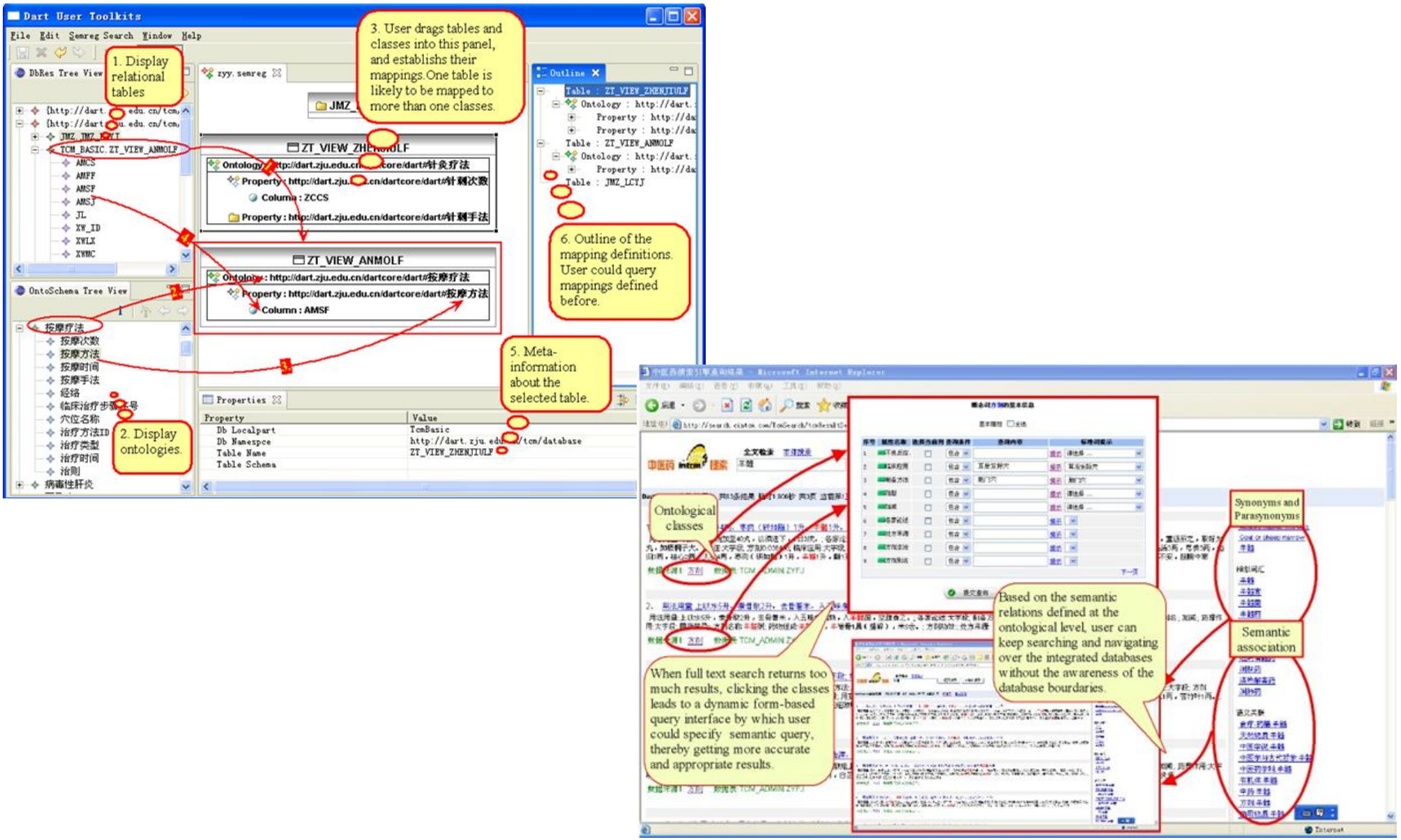
# *Semantic-based Search and Query System for the Traditional Chinese Medicine Community*

- Integration of a large number of relational databases (on traditional Chinese medicine) using a Semantic Layer
- 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, (SWEO Case Study)*

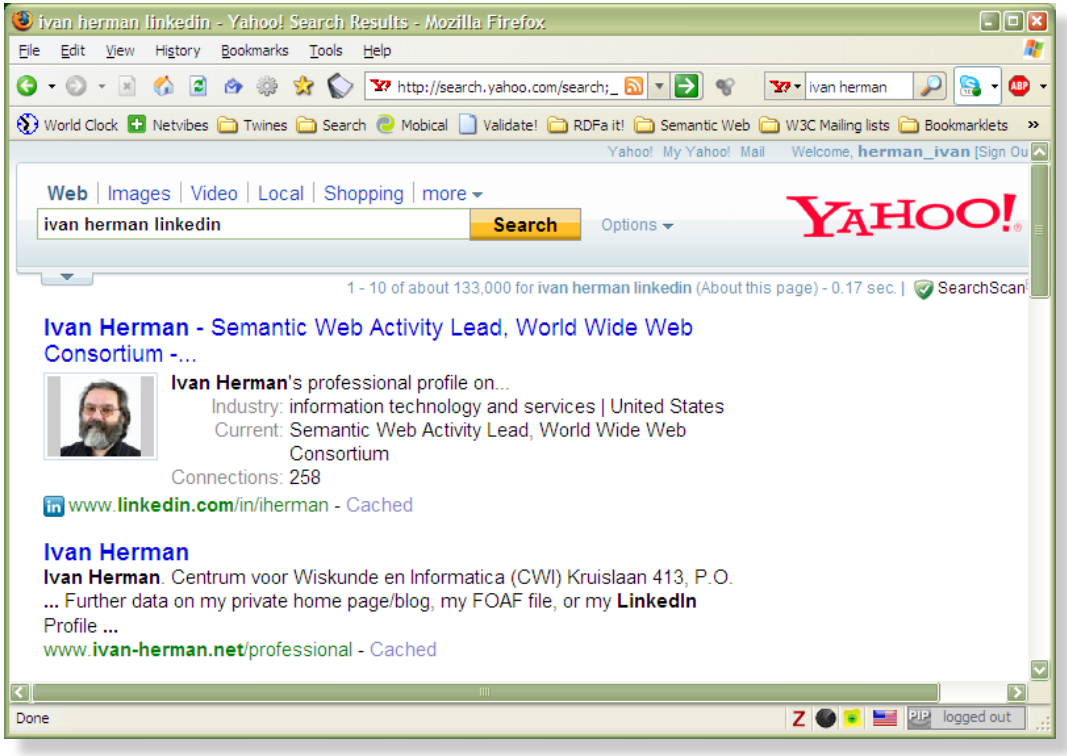
# > Academy of Trad. Chinese Medicine




*Courtesy of Huajun Chen, Zhejiang University, (SWEO Case Study)*

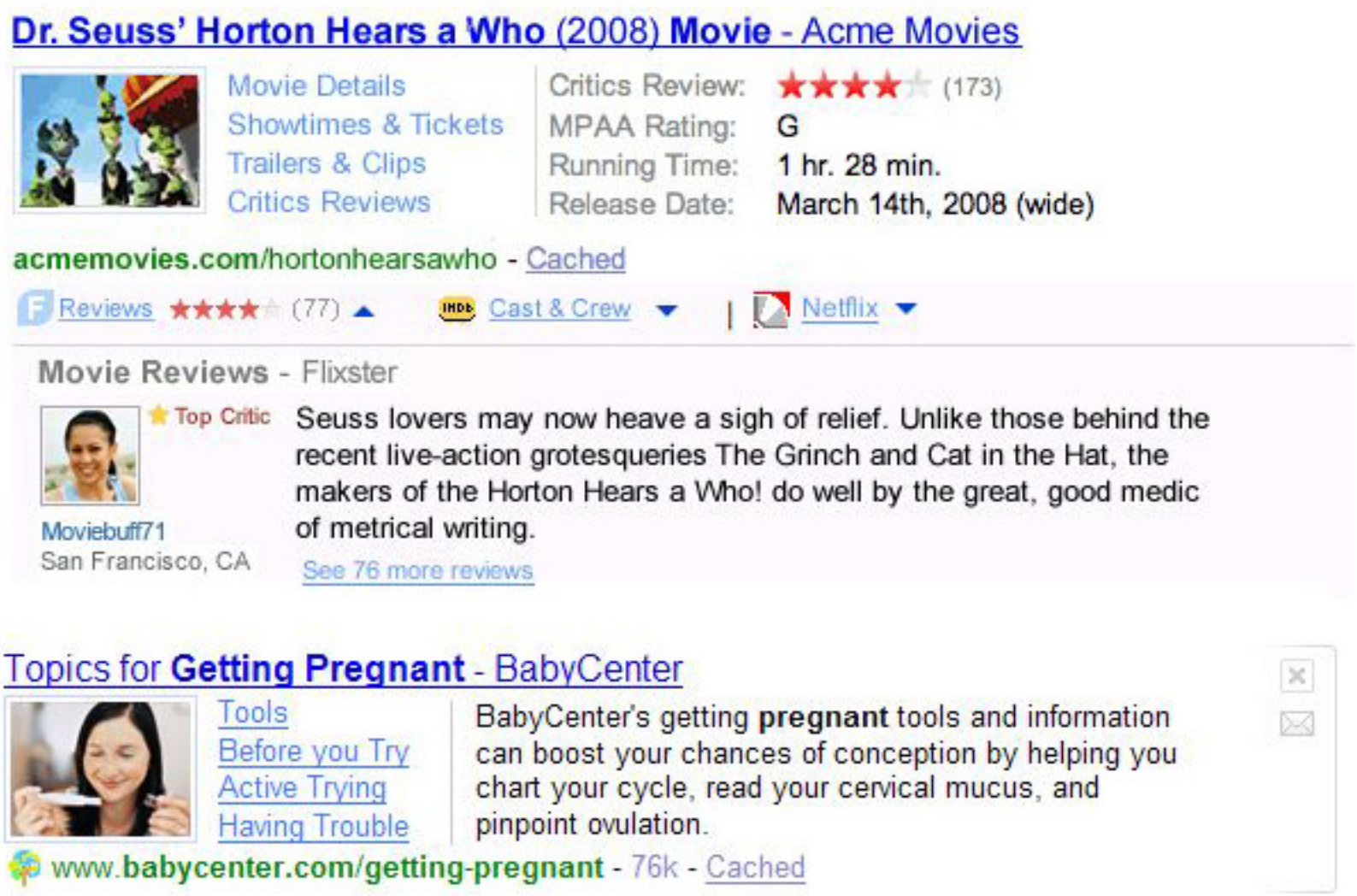
# *Improving Web Search using Metadata (SearchMonkey)*

- *SearchMonkey* reuses structural data to improve search result output with applications added to personalized search pages
- Metadata embedded in pages (in RDFa, eRDF, etc) are reused
- RDFa attributes can also be added to RSS feeds ("DataRSS"), exported by publishers, and reused by SearchMonkey




*Courtesy of Peter Mika, Yahoo! Research, (SWEO Case Study)*

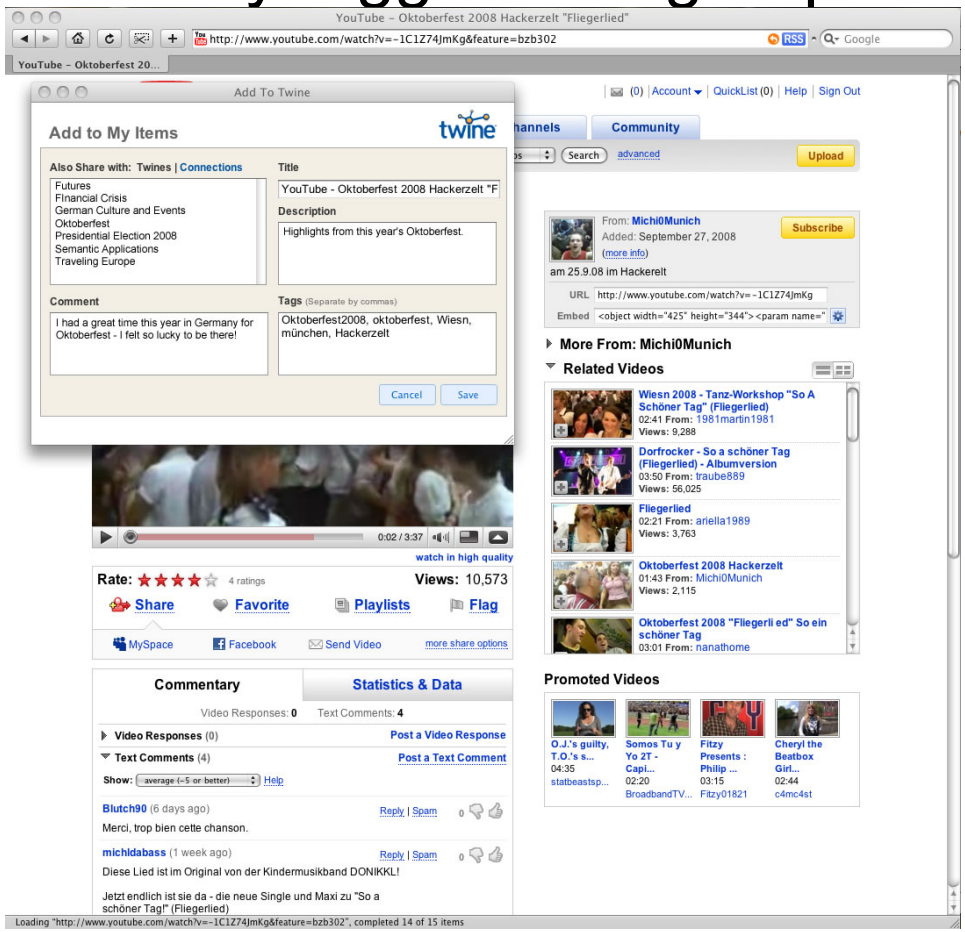
# > Yahoo!




*Courtesy of Peter Mika, Yahoo! Research, (SWEO Case Study)*

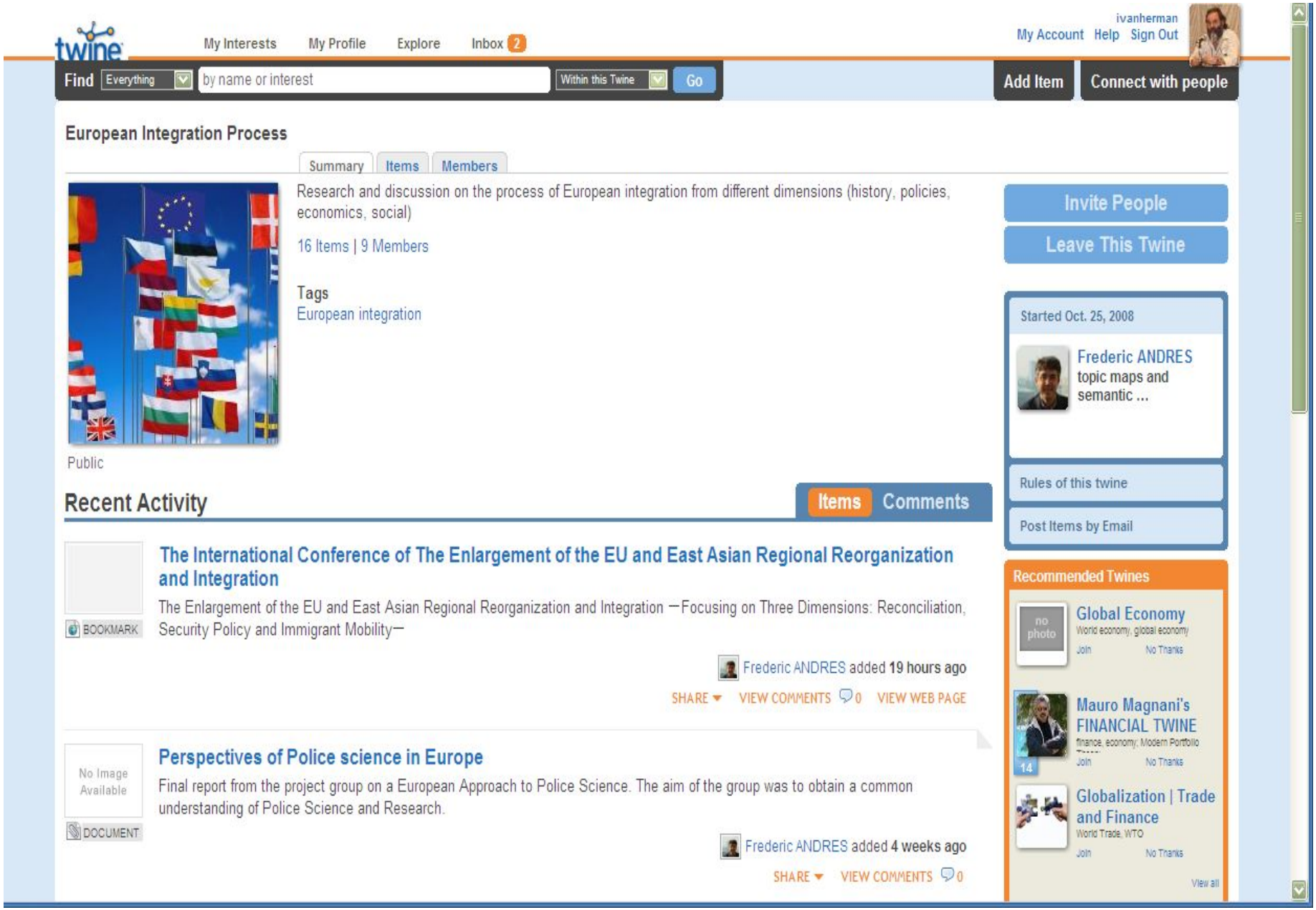
# *Twine*

- Social bookmarking and cooperation system
- Bookmarks are analyzed, automatically tagged and grouped
- Internals in RDF
- Grouping, tagging, relationships, etc, based on (OWL) ontologies
- Users' data will be available via SPARQL




*Courtesy of Jim Wissner and Nova Spivack, Twine, (SWEO Case Study)*

# > Twine




*Courtesy of Jim Wissner and Nova Spivack, Twine, (SWEO Case Study)*

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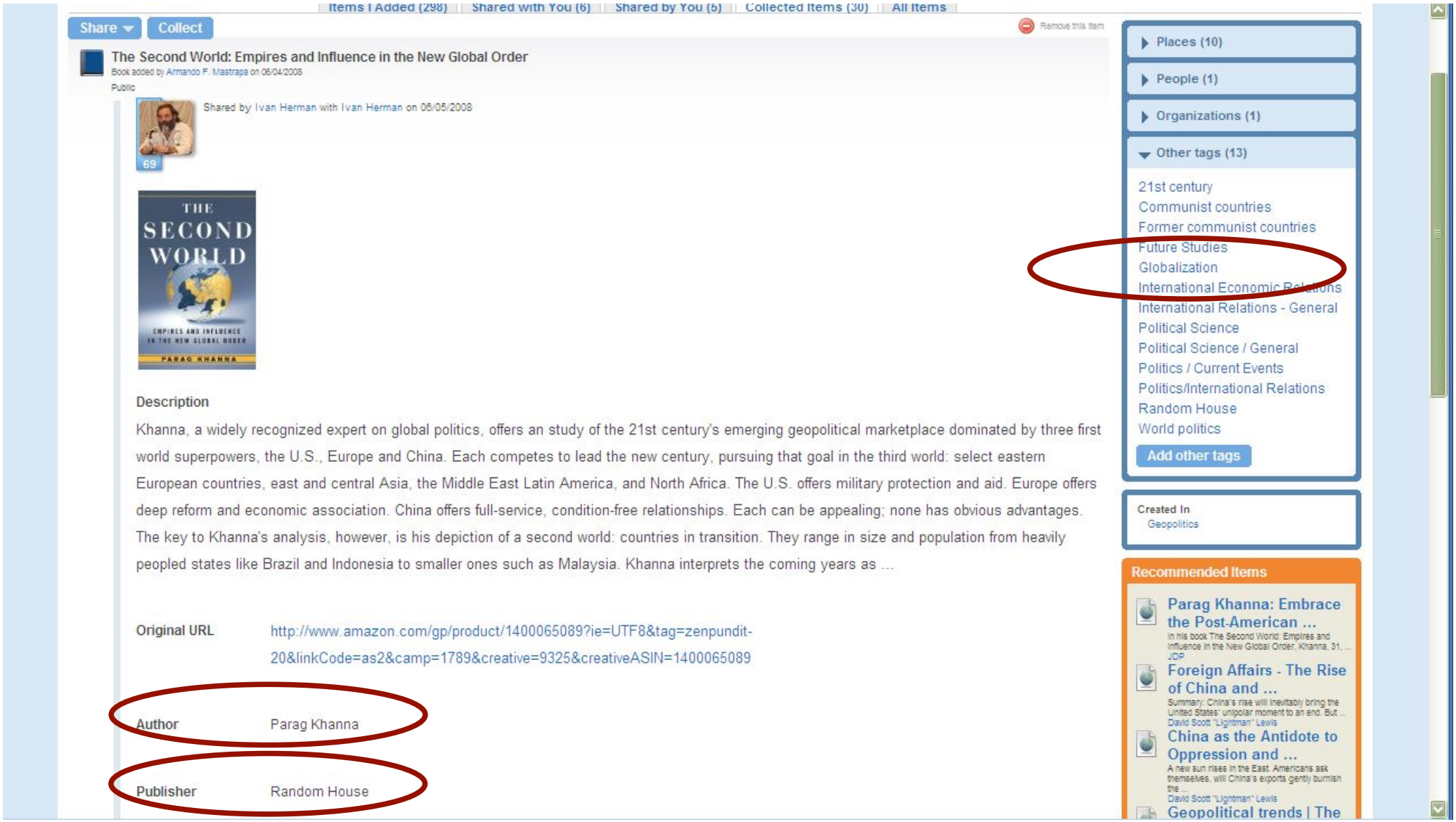
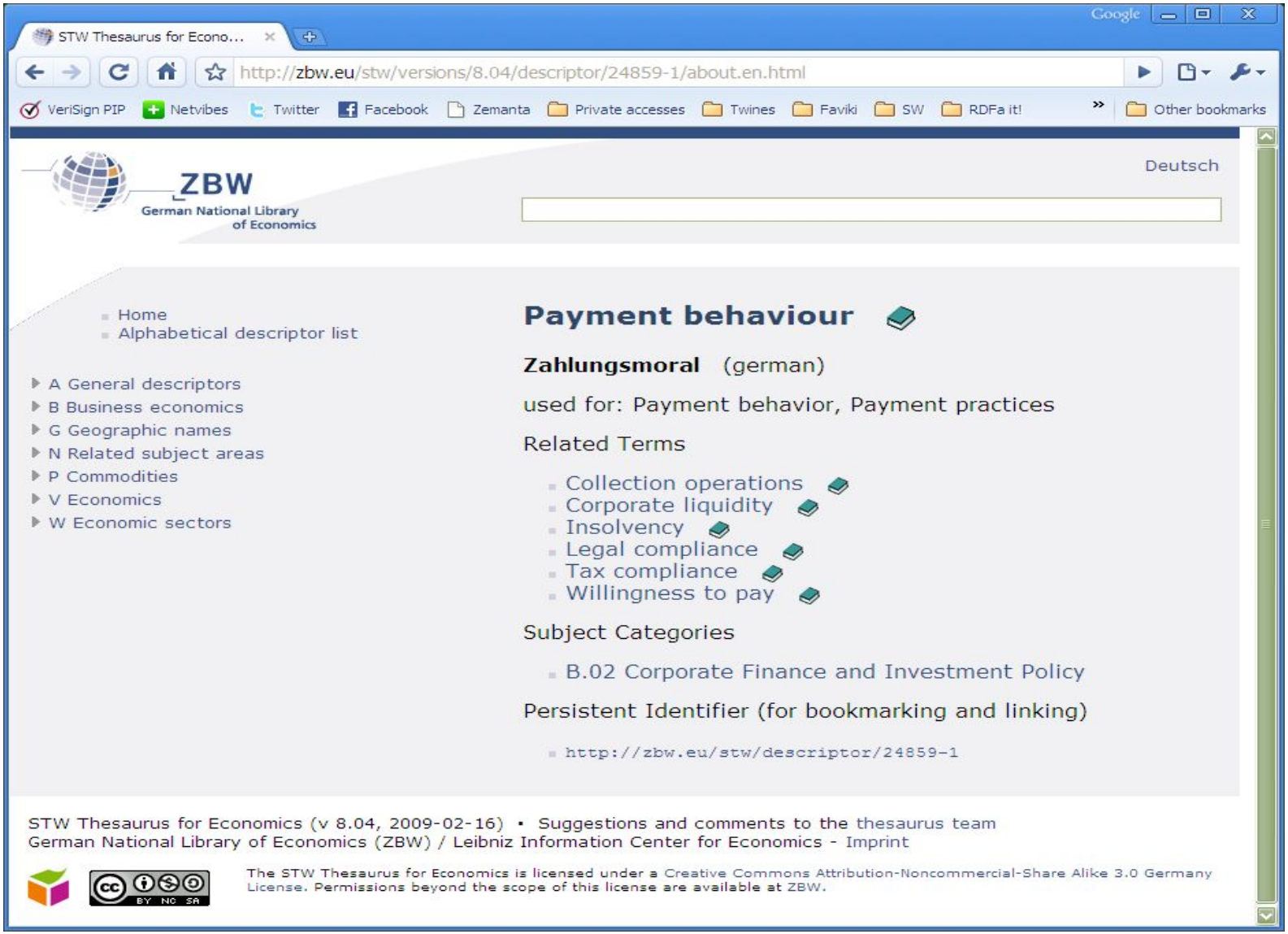


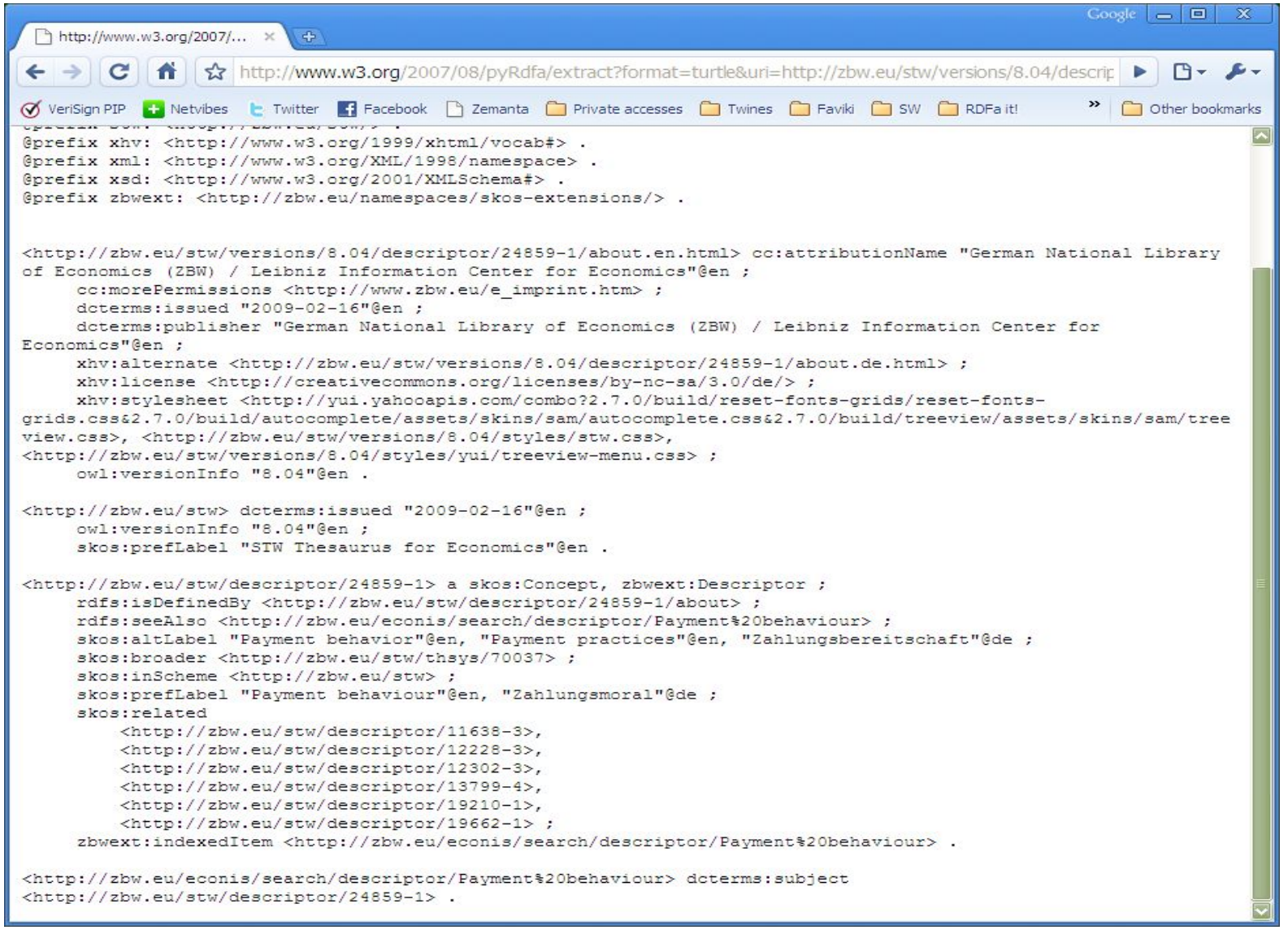

*Courtesy of Jim Wissner and Nova Spivack, Twine, (SWEO Case Study)*

# Publishing Thesaurus for Economics




*Courtesy of Timo Borst and Joachim Neubert, German National Library of Economics, (SWEO Case Study)*

# Publishing Thesaurus for Economics




*Courtesy of Timo Borst and Joachim Neubert, German National Library of Economics, (SWEO Case Study)*

# > German Nat. Library for Economics

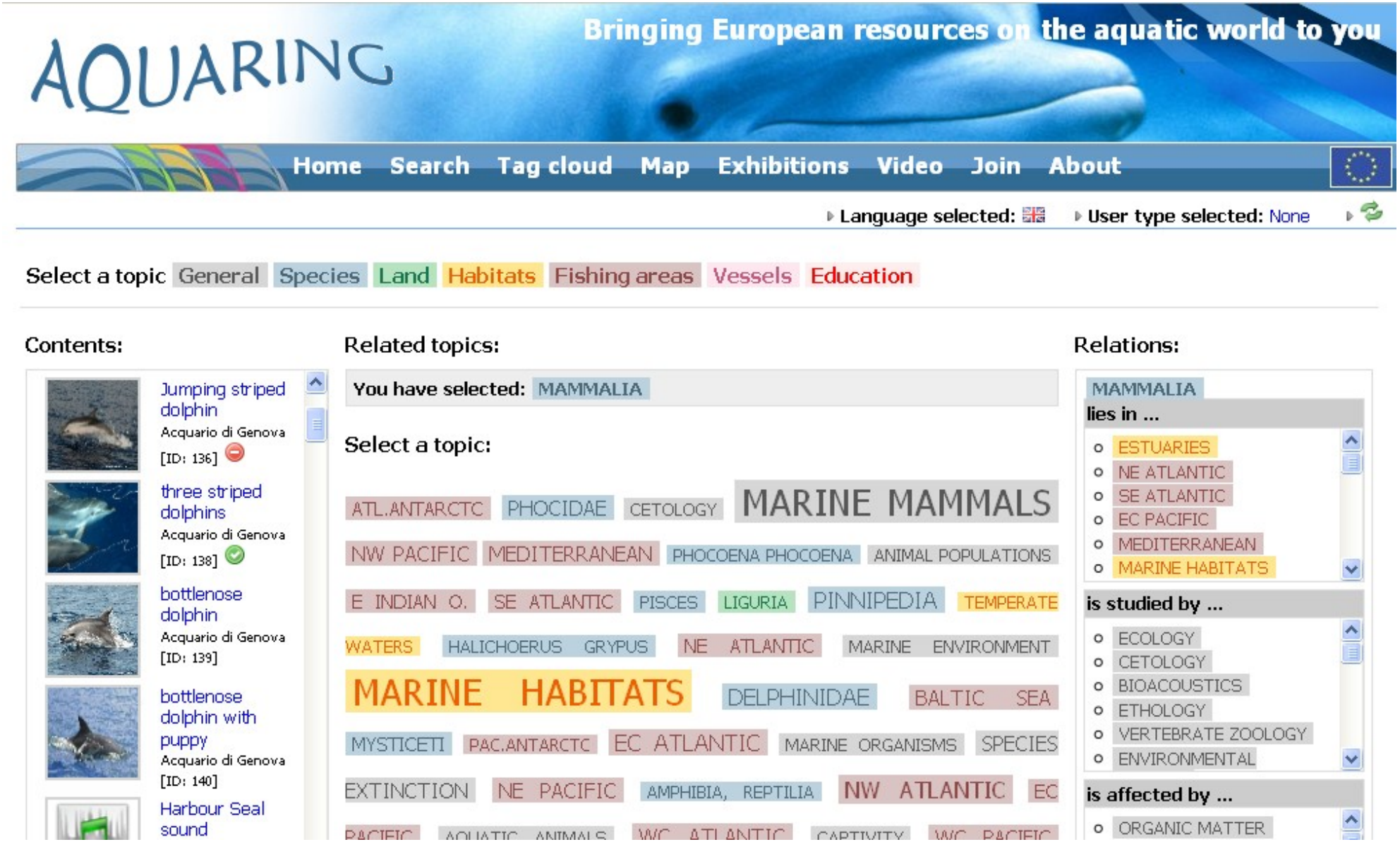
Autosuggest search based on the thesaurus

*Courtesy of Timo Borst and Joachim Neubert, German National Library of Economics, (SWEO Case Study)*

## *Online Resource for Information on Aquatic Sciences (www.aquaringweb.eu)*

- Portal to access diverse information on aquatic sciences
- External and internal ontologies provide semantic search, multilinguality, faceted user interface

*Courtesy of Marta González Rodríguez, Tecnalia, (SWEO Case Study)*



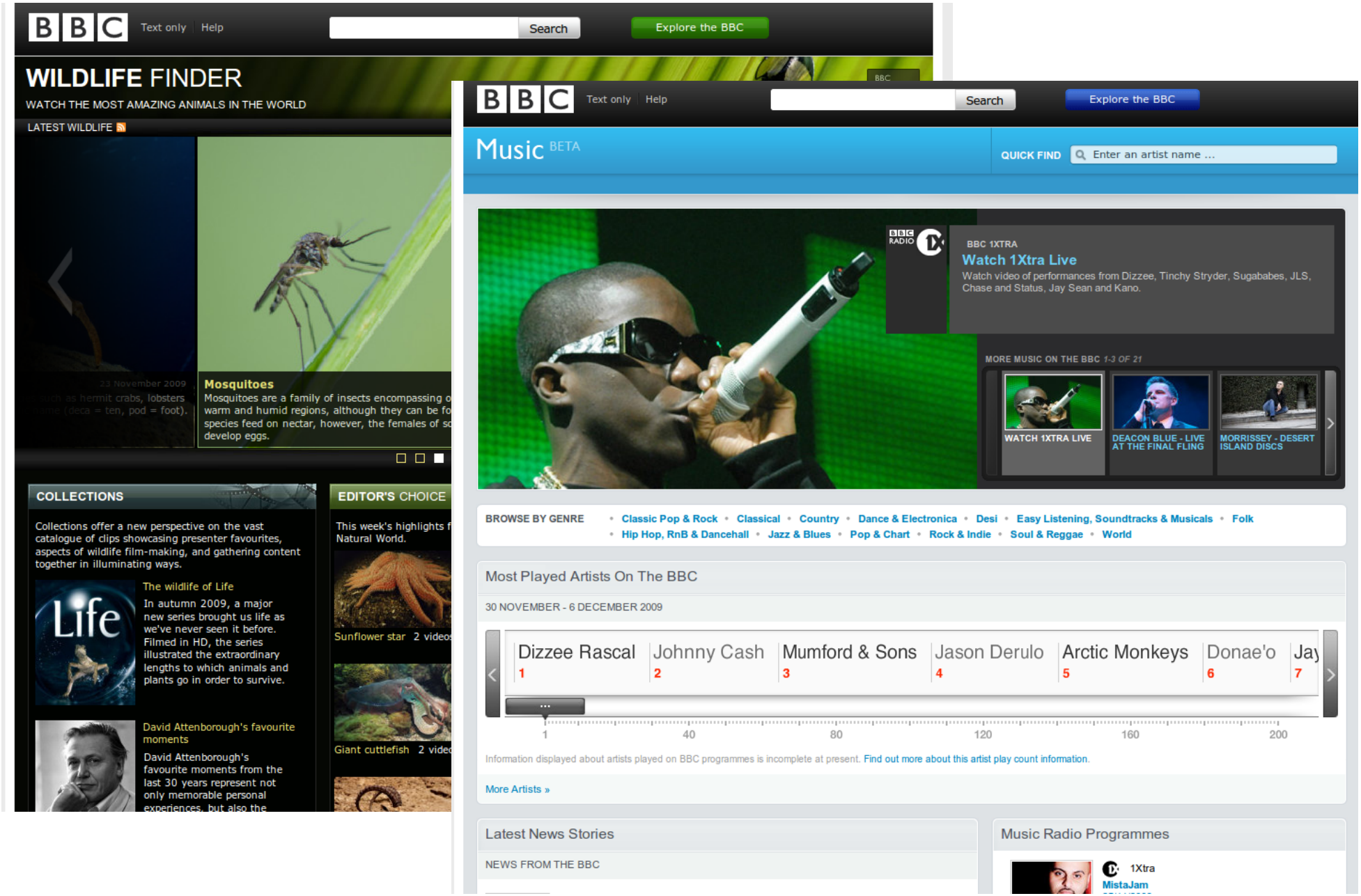

*Courtesy of Marta González Rodríguez, Tecnalia, (SWEO Case Study)*

# *Use of Semantic Web Technologies on the BBC Web Sites*

- The Web as a content management system
- Eg, on the BBC Music site
  - for each artist information is made available
  - content is gathered from public and linked databases
    - Eg, MusicBrainz, Wikipedia/DBPedia, etc
- Web site shows an aggregated view put into a BBC context

*Courtesy of Yves Raimond et al, BBC, (SWEO Case Study)*

# > BBC




*Courtesy of Yves Raimond et al, BBC, (SWEO Case Study)*

Ministry of Knowledge Economy
Korean Agency for Technology and Standards

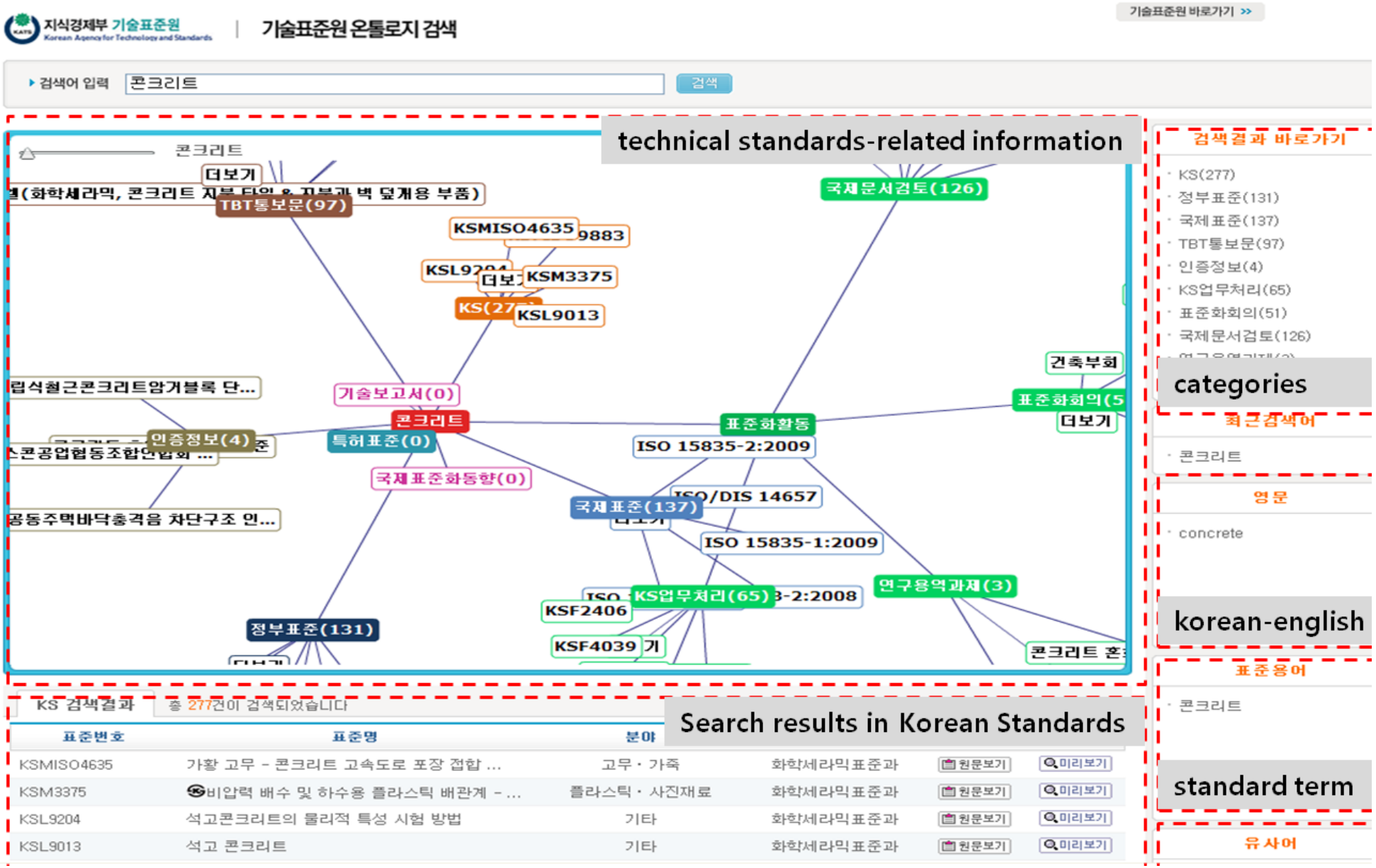
# *Integrated, Connected Search Service for Technical Standards Information*

- Integrated search service for technical standards
- Connected search service
- Non standard terminology is used by end-users
- Solution
  - ontology to describe (domestic) standards, patents, certificaiton information, trends in standards, standardization activity details
  - gather heterogeneous data for all these information
  - technical standards-related terminology thesaurus to support non-standard terminology access
  - visual and tabular representation of query results

*Courtesy of Pyung Kim, et al, KISTI and KAST, (SWEO Case Study)*

# > KISTI & KAST

Ministry of Knowledge Economy
Korean Agency for Technology and Standards




*Courtesy of Pyung Kim, et al, KISTI and KAST, (SWEO Case Study)*

## *iLaw—Intelligent Legislation Support System*

- legal services are to government departments, enabling them:
  - to review bills or legal cases in a wider and international framework
  - compare to similar legislation home and abroad, eg:
    - compare terms with those around
    - trends, academic papers, civil complaints
- based on:
  - integration of legal cases from US, Japan, and the EU countries, plus legal articles and academic papers in an RDF store
  - usage of own ontology, OWL and Rules reasoning

*Courtesy of Hanming Jung, et al, KISTI and MOJ Korea, (SWEO Case Study)*

# > KISTI & MOJ

*Courtesy of Hanming Jung, et al, KISTI and MOJ Korea, (SWEO Case Study)*

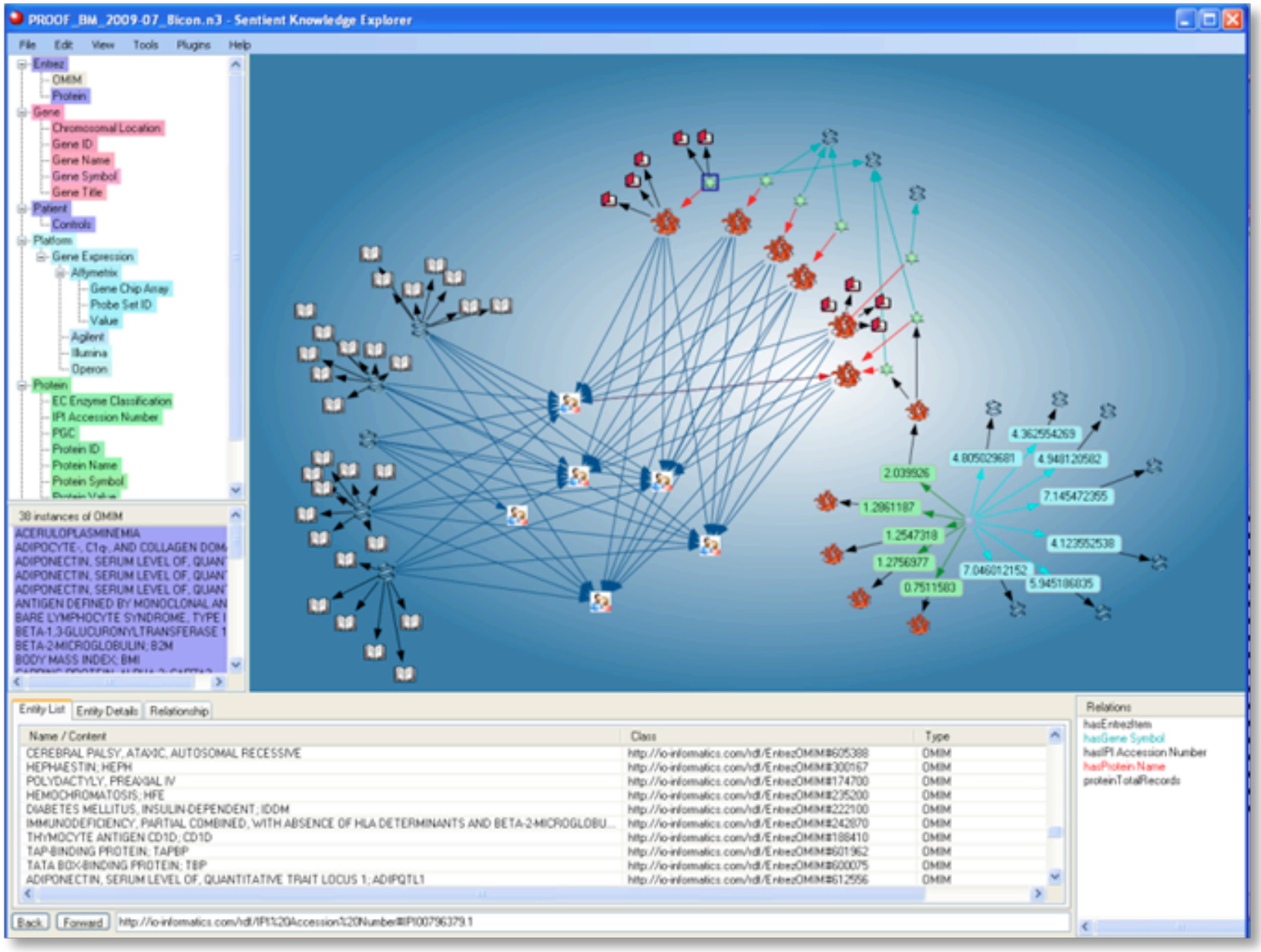
# > IO Informatics & UBC

## *Applied Semantic Knowledgebase for Detection at Risk of Organ Failure through Immune Rejection*

- data are integrated from experimental data, clinical endpoints, public ontologies, LOD, etc
- statistical analysis is performed on the integrated data
- a visual interface to generate ASK SPARQL queries is provided
  - query patterns are stored
- for clinicians, a simple web-based alerting of “hits” is provided with statistical scores

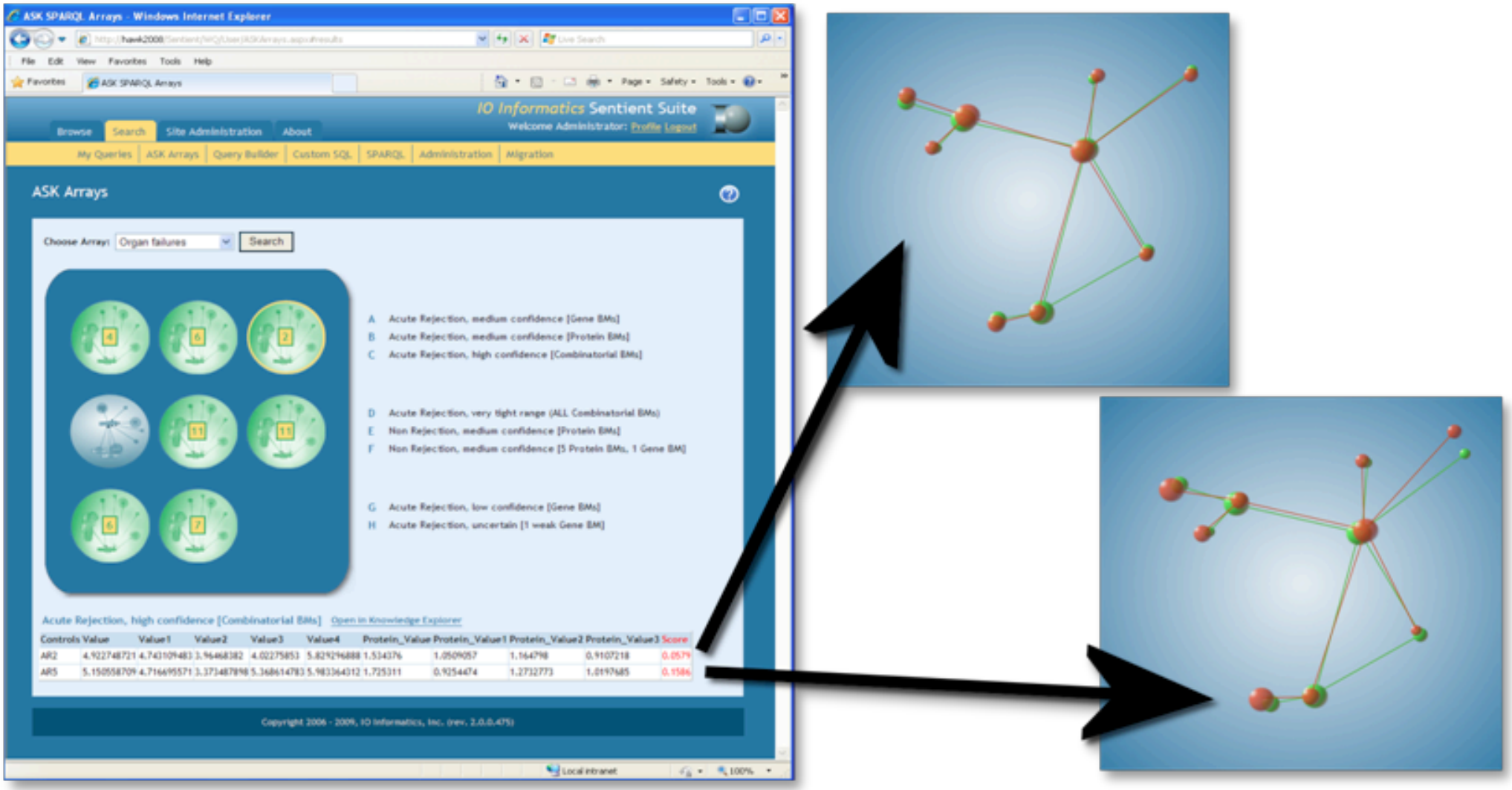
*Courtesy of Robert Stanley, et al, IO Informatics, USA, and UBC, Canada, (SWEO Case Study)*

# > IO Informatics & UBC




*Courtesy of Robert Stanley, et al, IO Informatics, USA, and UBC, Canada, (SWEO Case Study)*

# > IO Informatics & UBC




*Courtesy of Robert Stanley, et al, IO Informatics, USA, and UBC, Canada, (SWEO Case Study)*

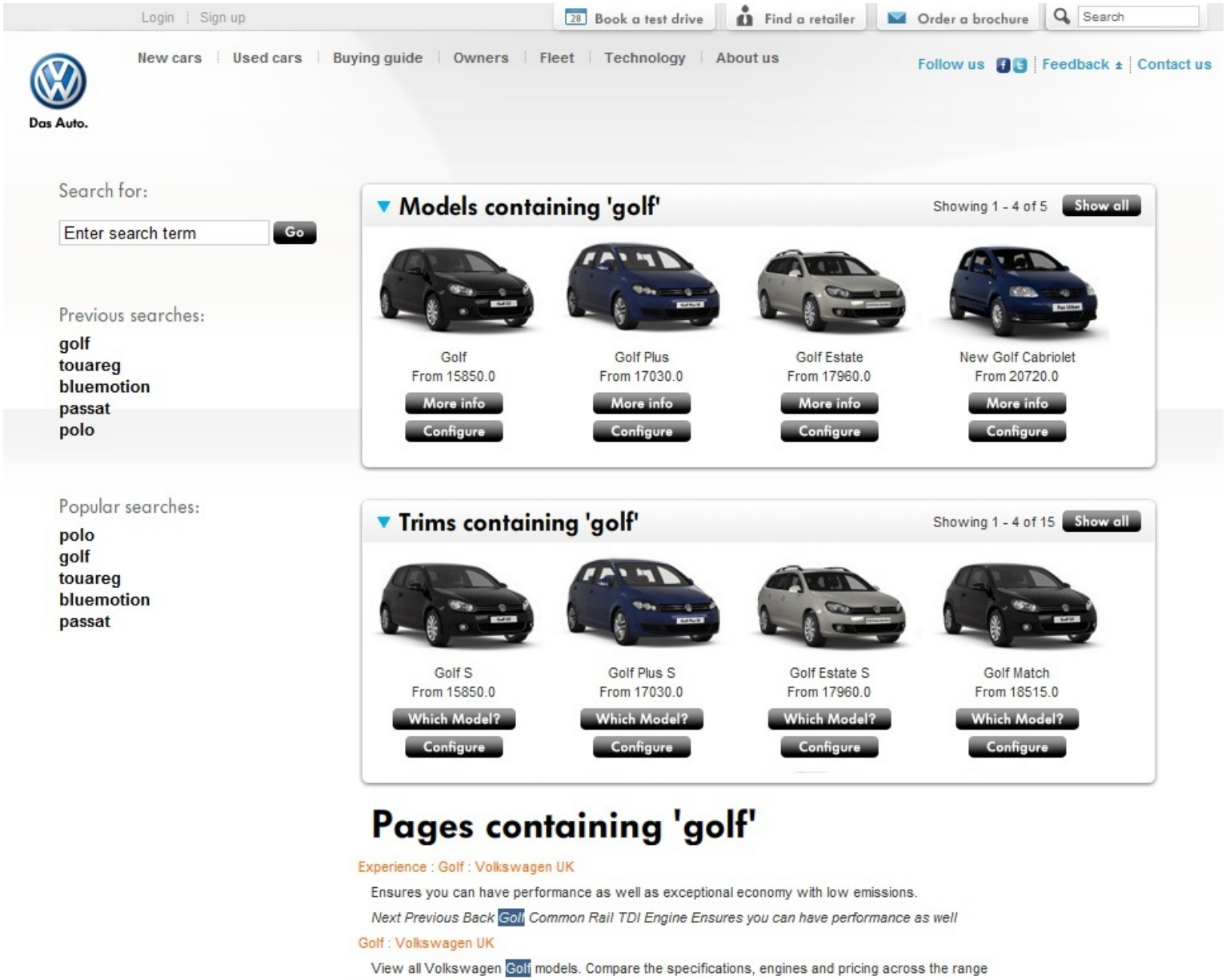
# > Volkswagen

## *Contextual Search for Volkswagen and the Automotive Industry*

- annotate HTML content using relevant vocabularies in RDFa and transform existing product data into RDF
- reason over the merged data set
- query over the results using SPARQL queries
- provide a visual, faceted search over the products

*Courtesy of William Greenly, et al, Tribal DDB UK, (SWEO Case Study)*

# > Volkswagen




*Courtesy of William Greenly, et al, Tribal DDB UK, (SWEO Case Study)*

## *Enriching and sharing cultural heritage data in Europeana*

- Europeana collects millions of cultural artifacts from musea, libraries, archives, etc, from all over Europe
- Rich metadata is available, but should be usable widely and make it available to everyone for new services
- A common data model has been defined,
- Metadata is also enriched, linking out to external datasets (Geonames, dbpedia, etc.) to enrich user experience

*Courtesy of Antoiine Isaac, European, (SWEO Case Study)*

# > Europeana

View item at
The British Library

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**Identifier:**
007000000000001U00031000 ; Maps.Crace I

**Format:** 368 ; 464 ; Engraving ; Millimetres ; jpeg

## the Cittie of London 31

**Creator:** Cartographer : Ryther, Augustus |

**Date:** [1633] ; 1633

**Geographic coverage:** 531500 , 181500 ; London, City of London

**Type:** StillImage | Map |

**Subject:** River Thames, London Bridge | London (England) — Maps | 912 |

**Relation:** Crace Collection Of Maps Of London. Collect Britain

**Description:** This map has been attributed to Augustus Ryther, an engraver who prospered between 1572 and 1592, contributing to Saxton's Atlas of 1579. This plan was produced to satisfy a European market, and contains certain inaccuracies which a native Londoner would not have tolerated. The streets appear very much wider than they were in actuality. Houses are depicted as having large gardens, when these had,
See more

**Data provider:** The British Library |

**Provider:** The European Library | United Kingdom |

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**Place Term:** http://sws.geonames.org/2643741/

**Geo Space:** 51.51279 ; -0.09184 ;

/record/92037/25F9104787668C4B5148BE8E5AB8

*Courtesy of Antoiine Isaac, European, (SWEO Case Study)*