Semantic Web Tiny-System

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Aim

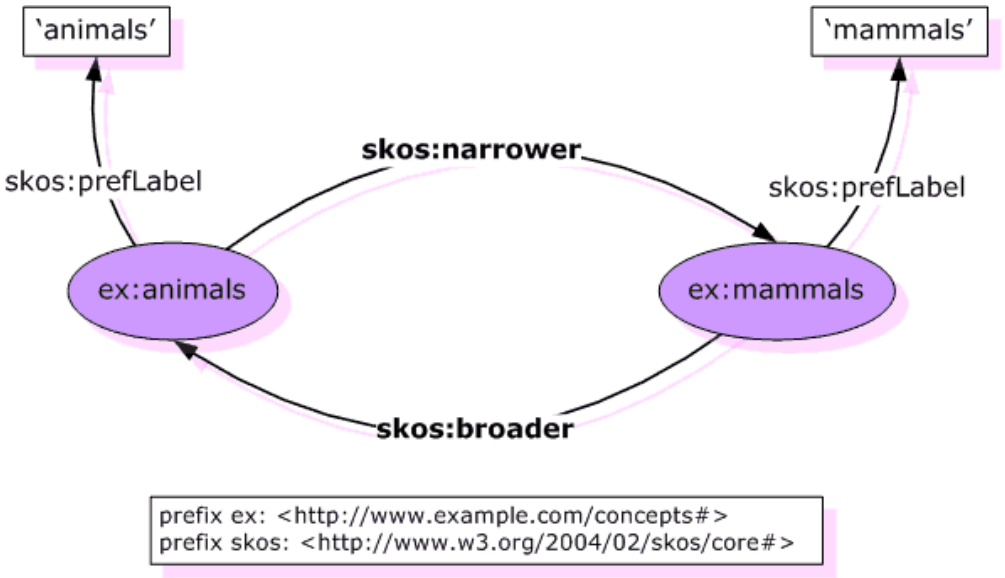
- The W3C Italian Office had the will to publish on its Web site reviews (20/30 words of description) about Semantic Web resources related to Java (at least initially)
- Why don't play with Semantic Web technologies and try to learn its tools in order to realize a tiny (very small)-system able to handle these reviews and publish them on a Web site?

- Information about Resources described with ontologies

```
examples of properties of a resource:
  Name
  Description
  URI
  date of the review
  ...
```

- OWL - Ontology Web Language
- It extends the predicate logic of RDF. For example it introduces the concept of equivalence among resources and the inverse relationship.
  - *equivalence among resources means to state that 2 or more URI represents the same element*
  - *inverse means the possibility to say "if (subject, predicate, object) then (object, inverse_predicate, subject) is true too".*

- Resources can be organized into categories
- SKOS stands for Simple Knowledge Organisation System. The name SKOS was chosen to emphasise the goal of providing a simple yet powerful framework for expressing knowledge organisation systems in a machine-understandable way.
- SKOS Core provides a model for expressing the basic structure and content of concept schemes.
- A 'concept scheme' is defined here as: a set of concepts, optionally including statements about semantic relationships between those concepts. Thesauri, classification schemes, subject heading lists, taxonomies, 'folksonomies', and other types of controlled vocabulary are all examples of concept schemes. Concept schemes are also embedded in glossaries and terminologies.
- It also allows to express Broader/Narrower Relationships: to assert that one concept is broader in meaning (i.e. more general) than another, where the scope (meaning) of one falls completely within the scope of the other, use the skos:broader property. To assert the inverse, that one concept is narrower in meaning (i.e. more specific) than another, use the skos:narrower property.



Courtesy of Ivan Herman

(skos:ConceptScheme)CategoryScheme skos:hasTopConcept skos:Concept(Documents, Events, Programs)

```
Schema_Categorie                                    Category_Scheme
     |                                                   |
     -- Documenti                                        -- Documents
     |                                                   |
     -- Eventi                                           -- Events
     |                                                   |
     -- Programmi                                        -- Programs
          |                                                   |
          -- Annotazione                                     -- Annotation
          |                                                  |
          -- Editore                                         -- Editor
          |                                                  |
          -- Interrogazione                                  -- Query
          |                                                  |
          -- Ragionatore                                     -- Reasoner
          |                                                  |
          -- Regole                                          -- Rules
    ...                                                 ...
```

category:Programs skos:narrower category:SemanticWeb
category:SemanticWeb skos:broader category:Programs

- Open source!
- Java ! (portable, secure, ...)
- eXtensible !
- Able to handle current Semantic Web standards

Jena

- Jena is a Java framework for writing Semantic Web applications
- Probably the most widely used Java environment for RDF and OWL today

- Features:
  - *RDF API*
  - *OWL API*
  - *Parser*
  - *Persistence*
  - *Reasoning Subsystem*

ARQ

- ARQ is a query engine for Jena that supports the SPARQL RDF Query language.
- SPARQL is the query language developed by the W3C RDF Data Access Working Group.

- The PostgreSQL database was already running on the site of the Office

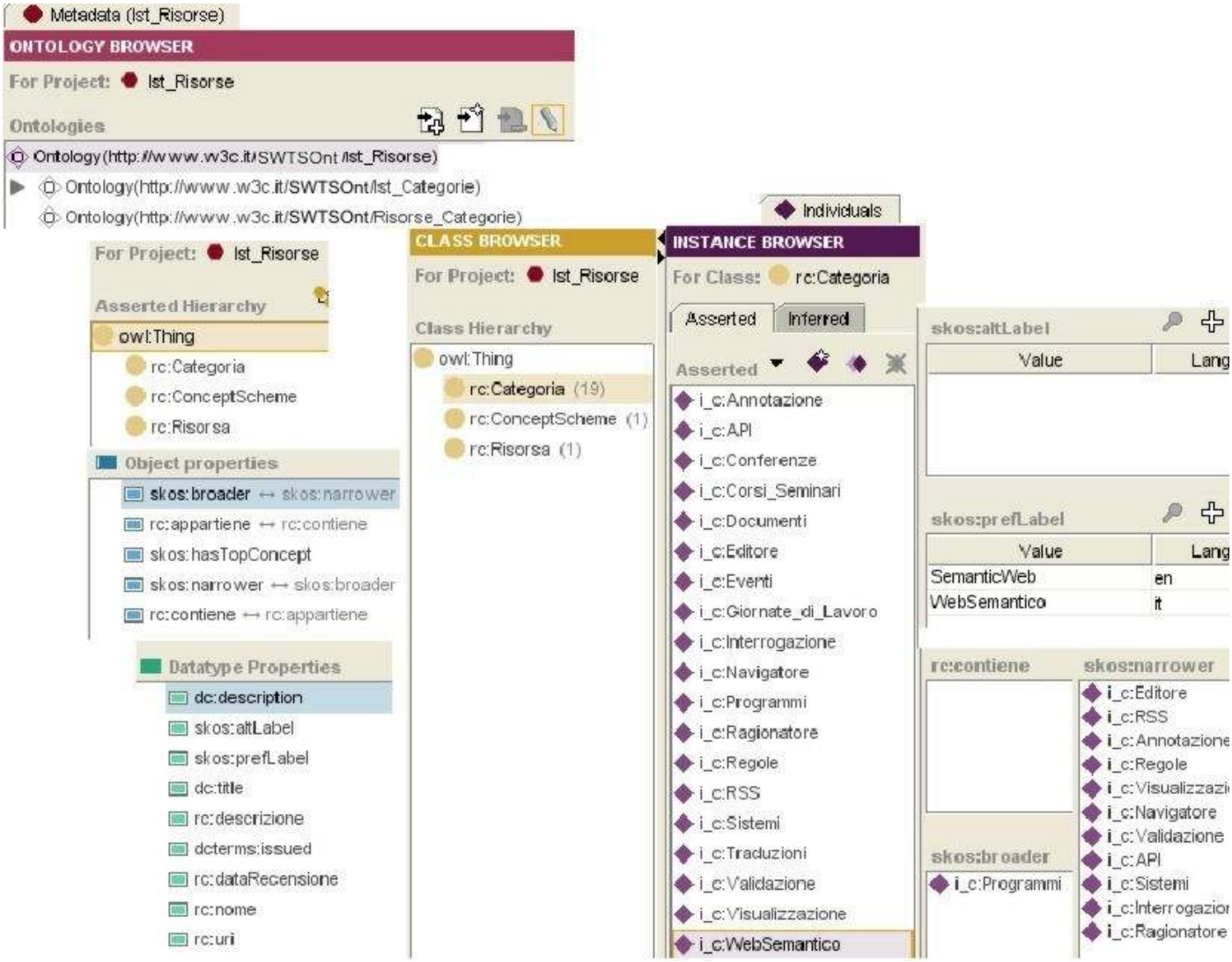
- Apache-Tomcat Apache Tomcat is the servlet container that is used in the official Reference Implementation for the Java Servlet and JavaServer Pages technologies

The first release of SWTS was released in July 2006 (keep reserved)

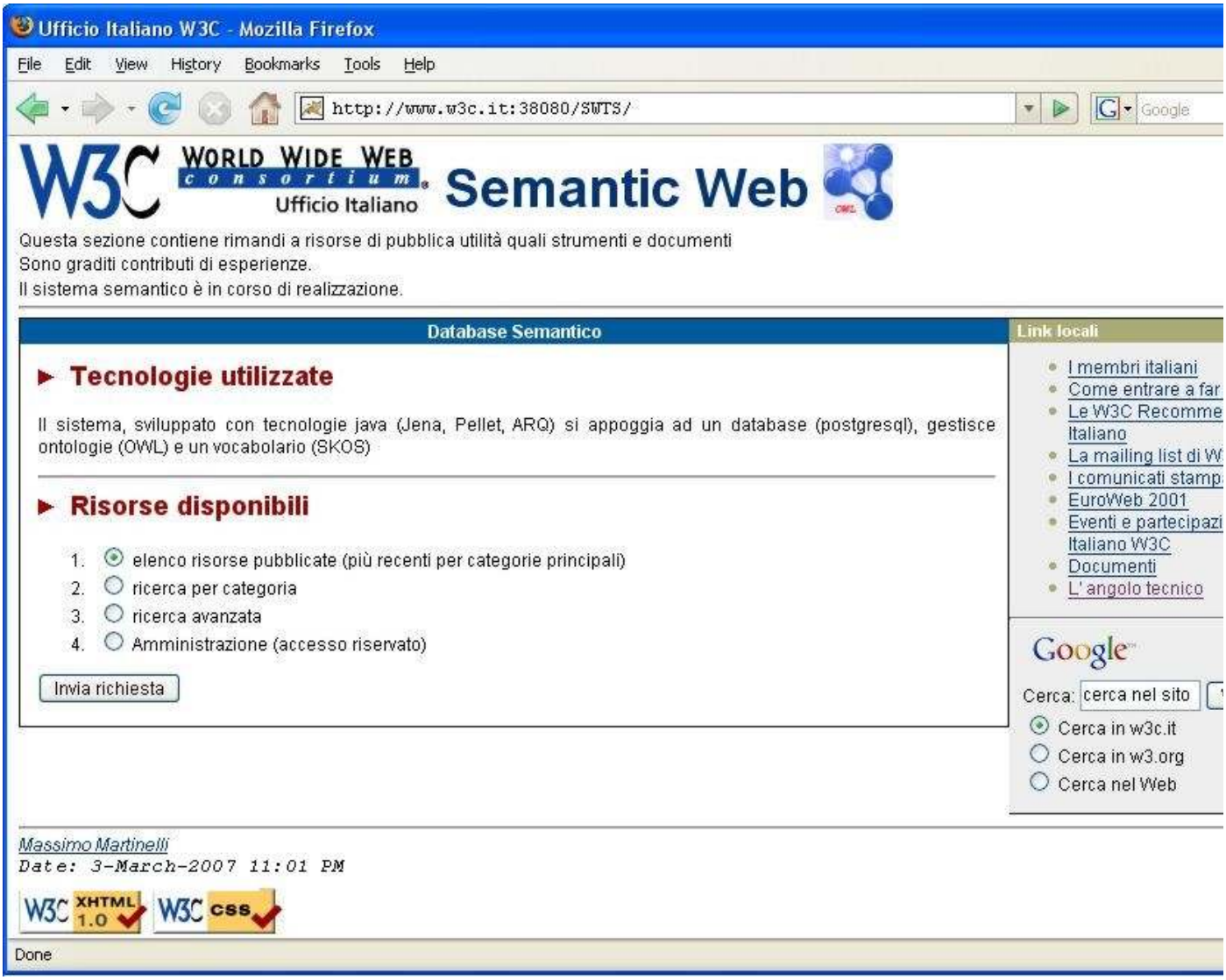
An extended version of SWTS is under developement: tests have been performed using Pellet and Bossam.

- Pellet is an open-source Java based OWL DL reasoner. It can be used in conjunction with either Jena or OWL API libraries.
- Bossam is a Java based OWL DL reasoner. It can be used in conjunction with Jena.

Resource rc:belongsTo Category
Category rc:contains Resource (inverse)



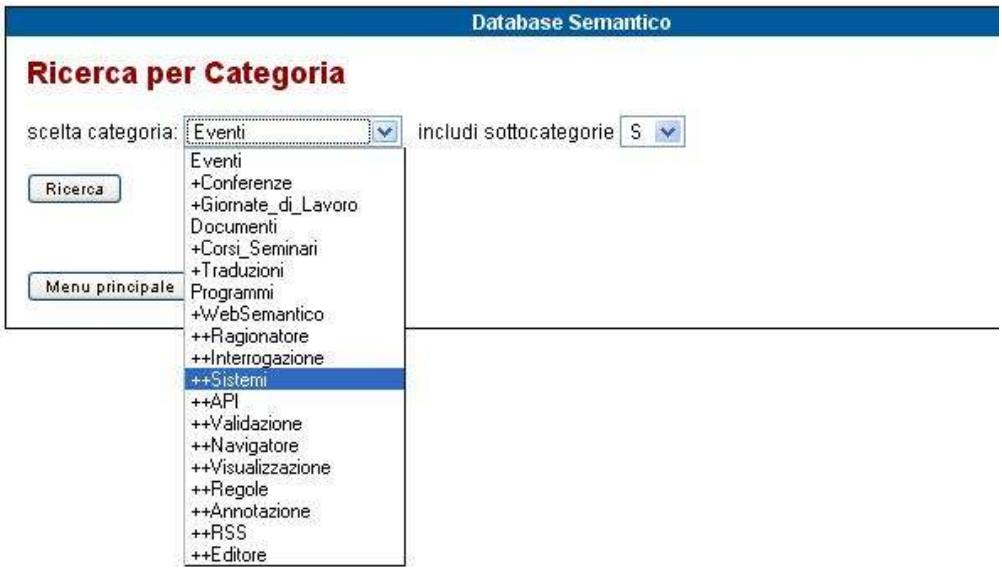
- List of published resources (more recent by top concepts)
- Search by category
- Advanced search
- Administration (reserved access)



How it works: Administration

- Export Model
- New Resource
- Remove Resource
- New Category
- Remove Category

Query by Category



Database Semantico

Risultato Ricerca per Categoria

Nome: Kaon
Descrizione: KAON2 e'una infrastruttura per gestire ontologie OWL-DL, SWRL, e F-Logic .
Description: KAON2 is an infrastructure for managing OWL-DL, SWRL, and F-Logic ontologies
Uri: http://kaon2.semanticweb.org/
Data Recensione: 2007-02-28
Categoria: http://www.w3c.it/SWTSOnt/Ist_Categorie#Sistemi
- - - - - - - - - - - - - -
Nome: Corese
Descrizione: Corese (Conceptual Resource Search Engine) e'un motore RDF scritto in Java e basato su Grafi Concettuali. Permette l'elaborazione di espressioni RDF Schema e RDF.
Description: Corese stands for Conceptual Resource Search Engine. It is an RDF engine written in Java and based on Conceptual Graphs (CG). It enables the processing of RDF Schema and RDF statements.
Uri: http://www-sop.inria.fr/acacia/soft/corese/
Data Recensione: 2007-02-28
Categoria: http://www.w3c.it/SWTSOnt/Ist_Categorie#Sistemi
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Nome: Jena
Descrizione: Jena e'un sistema di supporto Java per costruire applicazioni per il Web Semantico. Fornisce un ambiente di programmazione per RDF, RDFS e OWL, include un motore di inferenza basato su regole.
Description: Jena is a Java framework for building Semantic Web applications. It provides a programmatic environment for RDF, RDFS and OWL, including a rule-based inference engine.
Uri: http://jena.sourceforge.net/
Data Recensione: 2006-08-02
Categoria: http://www.w3c.it/SWTSOnt/Ist_Categorie#Sistemi

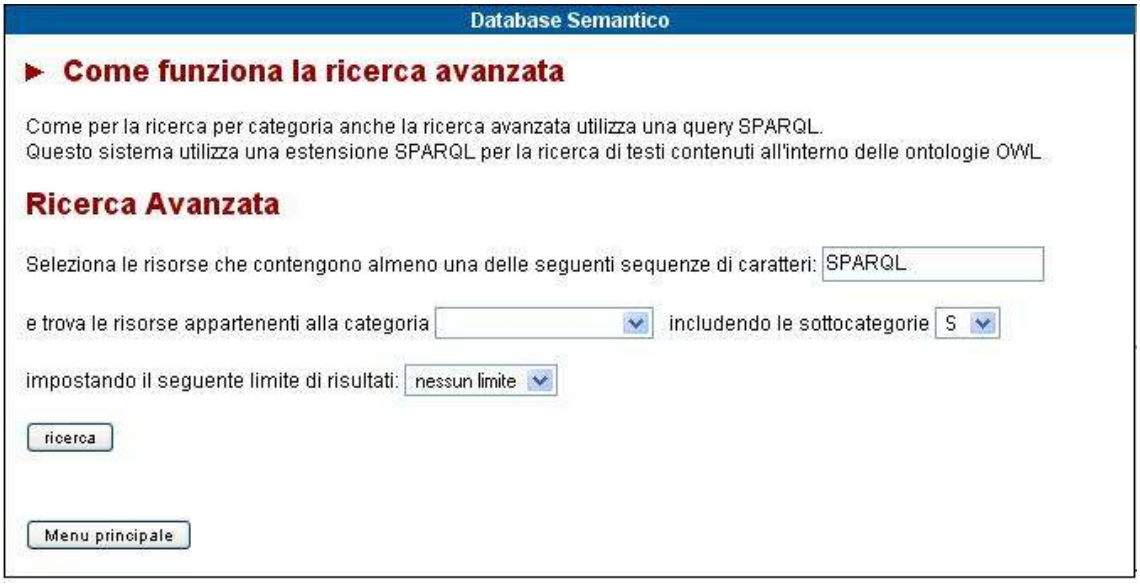
Menu precedente

Done

Advanced Search

resources containing a specific sequence of charachters

belonging to a specific category (subcategory)



Database Semantico

Risultato Ricerca Avanzata

Nome: ARQ

Descrizione: ARQ e'un motore di interrogazione per Jena che supporta il linguaggio di interrogazione SPARQL RDF.

Description: ARQ is a query engine for Jena that supports the SPARQL RDF Query language.

Uri: http://jena.sourceforge.net/ARQ/
Data Recensione: 2007-02-28
Categoria: http://www.w3c.it/SWTSOnt/Ist_Categorie#Interrogazione

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Menu precedente

Menu principale

The SPARQL Query for the Advanced Search

```
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
PREFIX rc: <http://www.w3c.it/SWTSOnt/Risorse_Categorie#>
PREFIX i_r: <http://www.w3c.it/SWTSOnt/Ist_Risorse#>
PREFIX i_c: <http://www.w3c.it/SWTSOnt/Ist_Categorie#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>

SELECT DISTINCT ?resource ?category ?date
WHERE { ?resource rc:name ?name;
                  rc:belongsTo ?category;
                  rc:reviewDate ?date;
                  rc:description ?description.
        FILTER REGEX(?description, "pattern")
      }
```

- improve the internationalization
- add other properties (e.g.: using vocabularies like as DOAP)
- add (play with) SWRL rules
- add an external reasoner *(a beta release is allowable)*

- use SWTS as a base for collecting informations about accessibility issues

- Any suggestion?

Contact us for suggestions and information

If it is not on the Web it does not exist ...

... you will find on the Office site (http://www.w3c.it/)
the *slides*
(http://weblabsrvbkp.isti.cnr.it:38080/SWTS/Slidy/SemanticWebTinySystem/SW

Try **Semantic Web Tiny Sistem** at
http://weblabsrvbkp.isti.cnr.it:38080/SWTS/