EN BUSCA DE UNA “SEMÁNTICA” PARA LA WEB SEMÂNTICA:

posibilidades y límites de una “semántica” de lo digital

ESTANCIA PÓS-DOUTORAL
U. CARLOS III DE MADRID, ESPAÑA
jul-dez 2011

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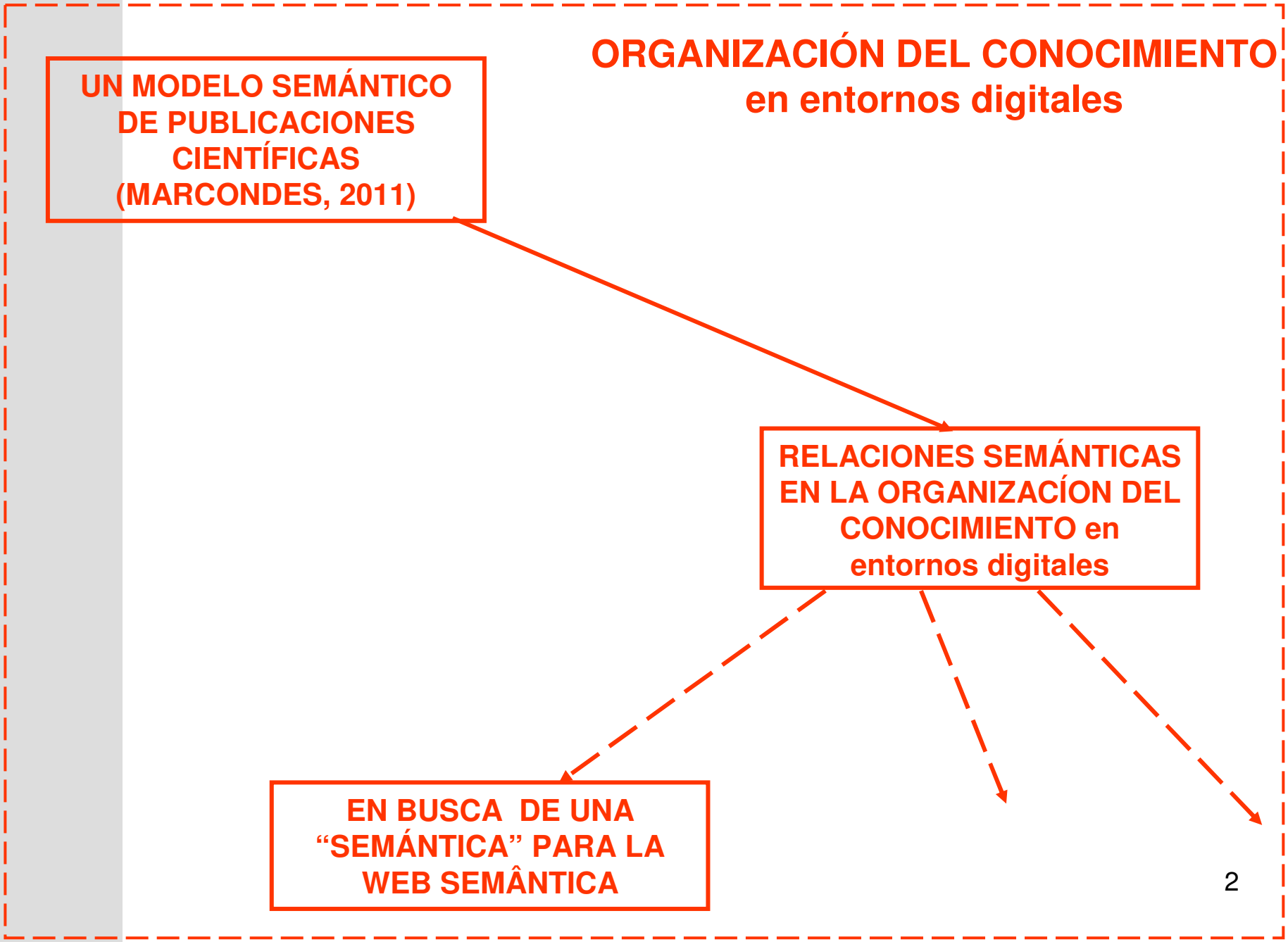
marcon@vm.uff.br


ORGANIZACIÓN DEL CONOCIMIENTO
en entornos digitales
UN MODELO SEMÁNTICO DE PUBLICACIONES CIENTÍFICAS (MARCONDES, 2011)
RELACIONES SEMÁNTICAS EN LA ORGANIZACÍON DEL CONOCIMIENTO en entornos digitales
EN BUSCA DE UNA "SEMÁNTICA" PARA LA WEB SEMÂNTICA

SUMARIO

1. Introducción

"semantic relations is the new frontier for Information Science in the 21st century" (KHOO; NA, 2005).

"The aim of this chapter is to demonstrate that semantic issues underline all research questions within *Library and Information Science* (LIS) (or just IS) and in particular the subfield known as Knowledge Organization (KO)" (HJÖRLAND, 2007, p. 367).

1.Introducción

Organización del Conocimiento en entornos digitales

✓ Crear SOCs que permitam que "software" simulem semântica y inferéncias humanas!!!

La cantidad de registros de conocimiento disponibles en la Web torna imperativo su tratamiento por métodos computacionales

- **multiplicidad de registros**
- **falta de estandardización terminológica**
- **necesidad de compatibilidad semántica para utilizar todo el potencial de conocimiento**
- **integración, comparación, compatibilidad de los conocimientos – Literature-related dicovery (KOSTOFF et al., 2009).**

1. Introducción – la propuesta de la Web Semantica

"The Semantic Web is not a separate Web but an extension of the current one, in which information is given well-defined meaning, better enabling computers and people to work in cooperation." (BERNERS-LEE, 2001 p. 2).

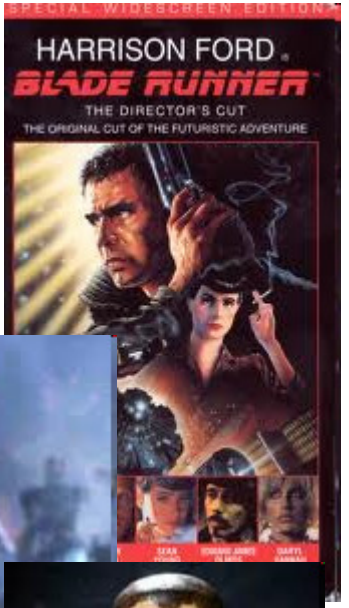
"The Semantic Web will bring structure to the meaningful content of Web pages, creating an environment where software agents roaming from page to page can readily carry out sophisticated tasks for users" (BERNERS-LEE, 2001 p. 2).

"… self-describing documents" (THE SELF-DESCRIBING WEB, 2000).

"The Semantic Web … it allows self-describing documents" (BERNERS-LEE, 2000).

"The Semantic Web is not "merely" the tool for conductiong individual tasks that we have discussed so far. In addition, if properly designed, The Semantic Web can assist the evolution of human knowledge as a whole" (BERNERS-LEE, 2001 p. 2).


A.I.
Music From The Motion Picture
ARTIFICIAL INTELLIGENCE

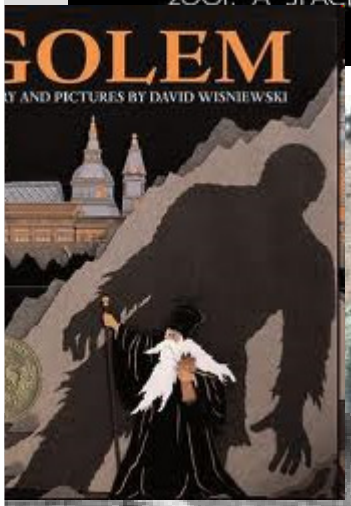

HARRISON FORD
BLADE RUNNER
THE DIRECTOR'S CUT
THE ORIGINAL CUT OF THE FUTURISTIC ADVENTURE

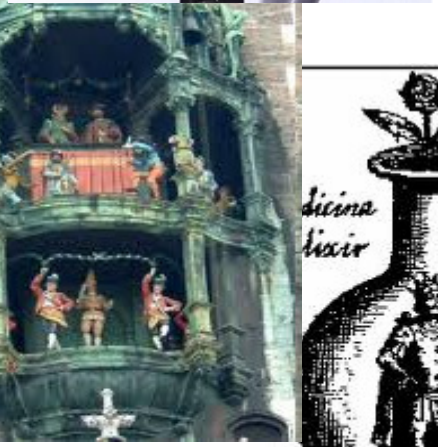

2001: A SPACE ODYSSE


WHAT WILL YOU DO WITH


SCHWARZENEGGER
INSENSIBLE
à la douleur et à la peur
IMPOSSIBLE
à arrêter
GRAND PRIX
FESTIVAL D'AVORIAZ
1985
TERMINATOR


STANLEY KUBRICK'S
2001:
space odyssey


GOLEM
AND PICTURES BY DAVID WISNIEWSKI



i,ROBOT


dicina
dixir
Rubea fuve
rubeum.


FRANKENST

1. Introducción: Semántica y SOCs

> **In an enumerative, precoordinated classification, the hierarchical links ostensibly represent the generic relation between a class and its subclasses, but in practice they may also be used for the class-membership relation. The nature of the link becomes somewhat indeterminate when, for example, a part or attribute is shown as a subclass of an entity (VICKERY, 2009)**

En la actualidad, esta falta de criterios apuntada por Vickery, hace que cada vez se consideren más prometedores los criterios ontológicos, formales y explícitos para la organización del conocimiento, criterios basados en la naturaleza misma de los entes de un dominio, hasta donde podemos discernirlos con el instrumental que la Ciencia nos provee. Criterios ontológicos, formales y explícitos nos permiten representar y organizar dominios de conocimiento en entornos digitales y permitir la "inferencia" de los ordenadores.

1. Introducción: Lenguaje y Semántica

El niño chutó la pelota.

La pelota chutó el niño.

El hombre fue muerto por una bala. (El hombre fue muerto por alguien con un arma de fuego que le disparó una bala.)

Esta manzana es roja.

La color de esta manzana es rojo.

Rojo-sangre es un (tipo de) rojo.

Juan es un rojo (Guarino)

2. Pensar, calcular

El universo-máquina de Laplace

"Nosotros podemos tomar el estado presente del universo como efecto de su pasado y la causa de su futuro. Una inteligencia que, en todo momento, conociese todas las fuerzas que dirigen la naturaleza y todas las posiciones de todos los ítems que componen la naturaleza, si esta inteligencia también fuese lo suficientemente poderosa como para analizar esas informaciones, comprendería en una única fórmula los movimientos de los más grandes cuerpos del universo y los del átomo más pequeño; para esa inteligencia nada sería incierto y el futuro, así como el pasado, estarían delante de sus ojos". Laplace, *Essai*

2. Pensar, calcular

Las situaciones sin salida de la Ciencia determinista a principios del siglo XX

Física - Principio de la indeterminación de Heisenberg (1901-1976)

Matemática - Teorema de la incompletitud, Kurt Gödel (1906-1978)

Física – Teoría de la Relatividad, Einstein (1879-1955)

2. Pensar, calcular…

Máquinas de Turing, prueba automatica de teoremas: ¿María está feliz?

PROGRAMA

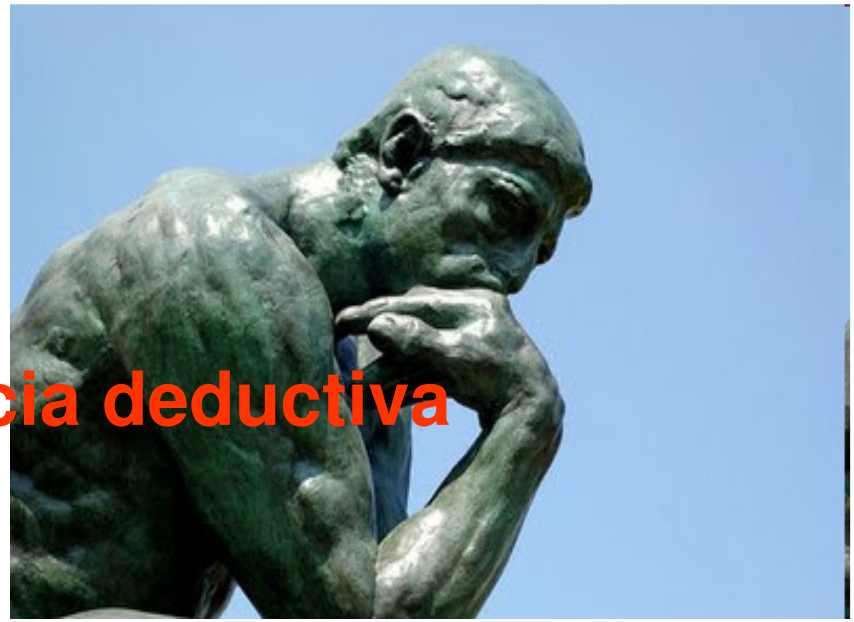
- **Leer ENTRADA;**
- **Si ENTRADA es una frase con la forma "*si ... entonces ...*", busque en la memoria la existencia de la frase = a lo que sigue al *si,* avance una ENTRADA y grabe la frase que sigue a *entonces,* si no lo encuentra, guarde ENTRADA en la memoria y avance para la siguiente ENTRADA;**
- **Si ENTRADA no es una frase de la forma "*si ... entonces ...*", *busque* en la memoria la existencia de una frase de la forma "si ... entonces ..."; si la encuentra, avance una ENTRADA y grabe la frase que sigue al *entonces,* si no la encuentra, guarde ENTRADA en la memoria y avance para la próxima ENTRADA;**
- **Si lee una ENTRADA en blanco, pare.**

Início →

1. **"Si Juca está feliz entonces Leo este feliz";**
2. **"Si Leo está feliz entonces Maria está feliz";**
3. **"Juca está feliz";**
4. **"Leo está feliz;"**
5. **"María está feliz";**
6. **blanco**

2. Pensar, calcular…

Lógica Formal – inferencia deductiva

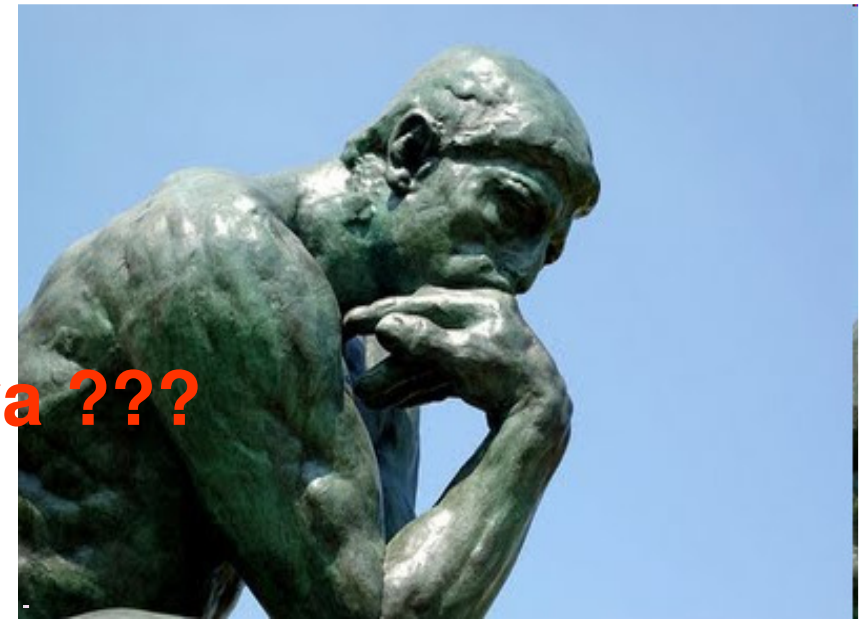


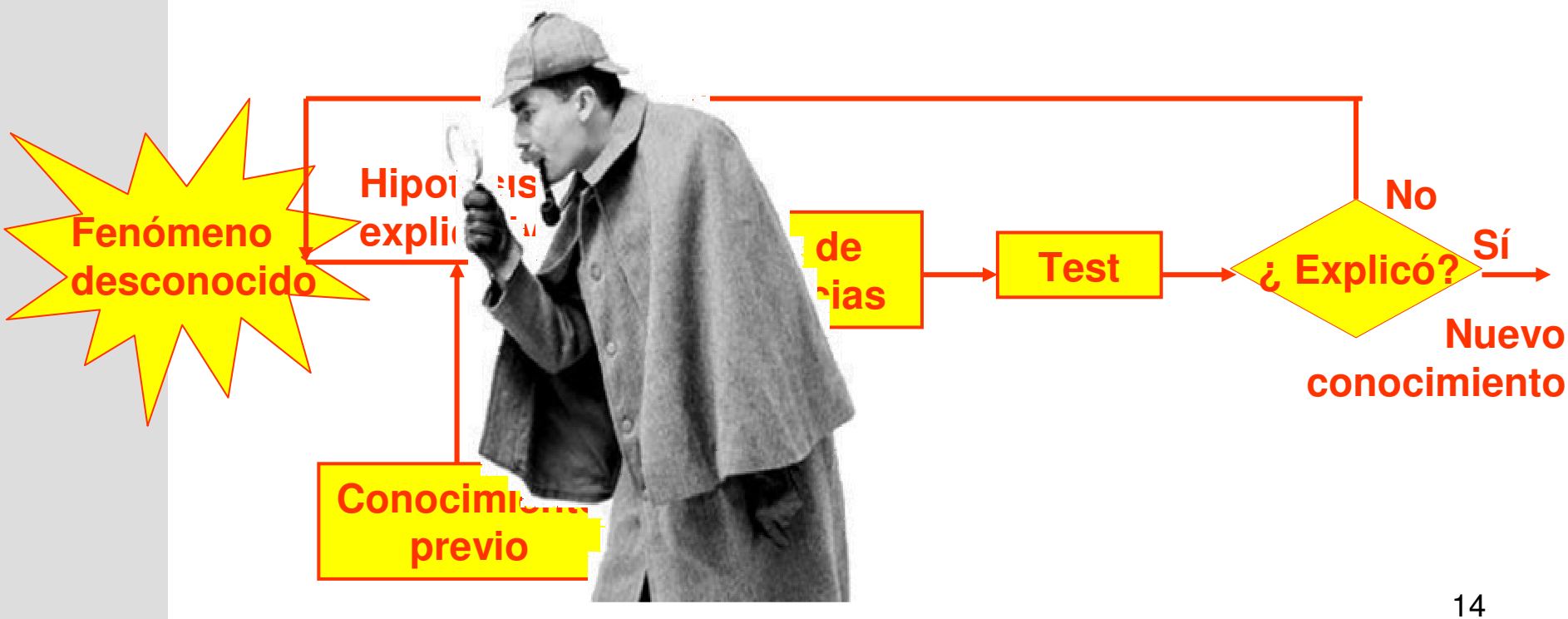
- “Todo hombre es mortal;
- Sócrates es hombre;
- luego, Sócrates es mortal”

-“Todo A es X;
- a es A;
- luego, a es X”

2. Pensar, calcular…

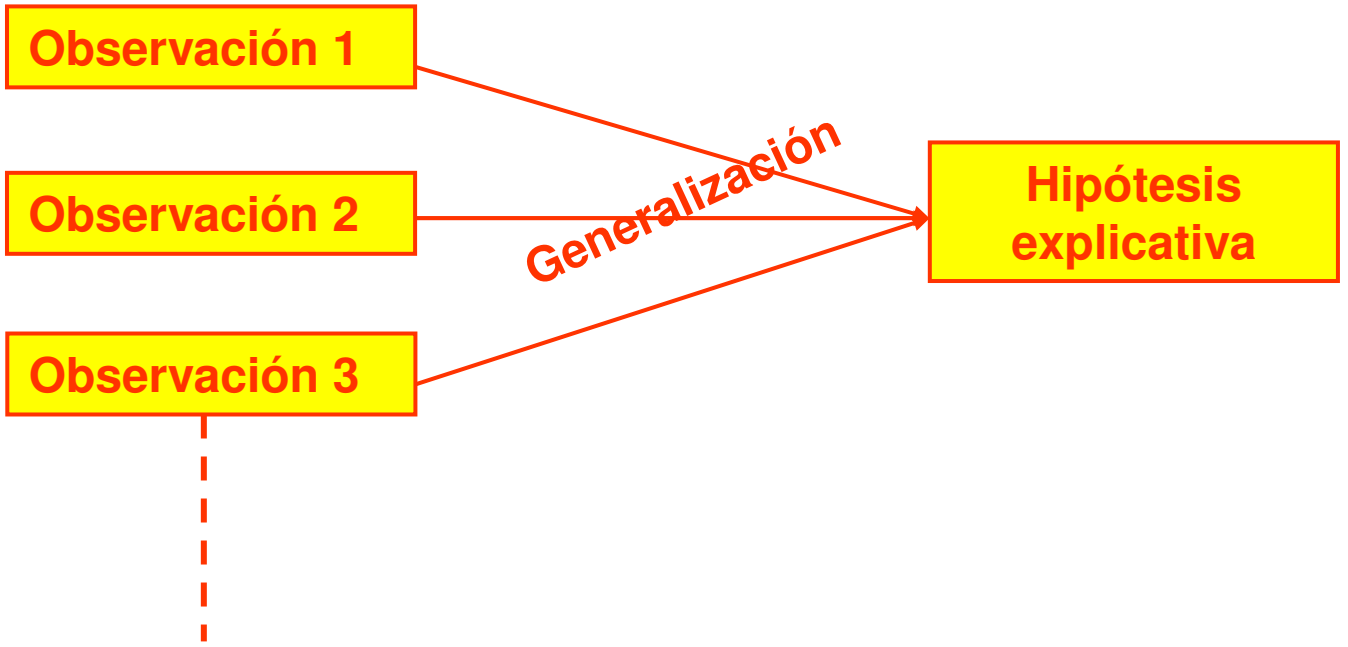
¿¿¿ Inferencia abductiva ???





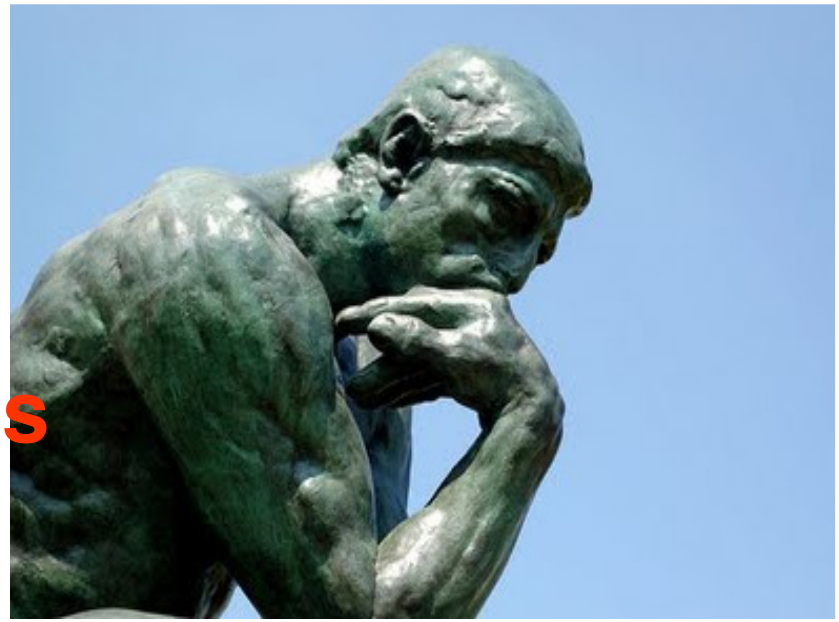
2. Pensar, calcular…

¿¿¿ Inferencia inductiva ???



2. Pensar, calcular…

Lógica Formal – Falácias



- “Se eso lo ha dicho una mujer,

- seguro que no hace sentido”

- “En Filosofía, Sócrates es ultrapasado; Sartre, por ser mas reciente, es mejor”

3. “Semántica” Computacional

Dos visiones de la Semántica:

- **Semiótica/Referencial: relación signo-realidad (Pierce, Frege)**
- **Instrumental: lo que hacemos con el lenguaje, “juegos de lenguaje”, “actos del habla” (Wittgenstein, Austin, Searle)**

3. “Semántica” Computacional

Dos visiones do que sea Semántica:

- **Semiótica/Referencial – relación signo-realidad (Pierce, Frege)**

  “La semiosis es el fenómeno, típico de los seres humanos (y, según algunos, también de los ángeles y de los animales), por el cual - como dice Peirce - entran en juego un signo, su objeto (o contenido) y su interpretación.” (ECO, 1989, p. 11, nota).

3. “Semántica” Computacional

Dos visiones do lo que es Semántica:

- **Instrumental: lo que hacemos con el lenguaje, “juegos de lenguaje”,“actos del habla” (Wittgenstein, Austin, Searle)**

✓ **Modelo computacional: programas X datos**

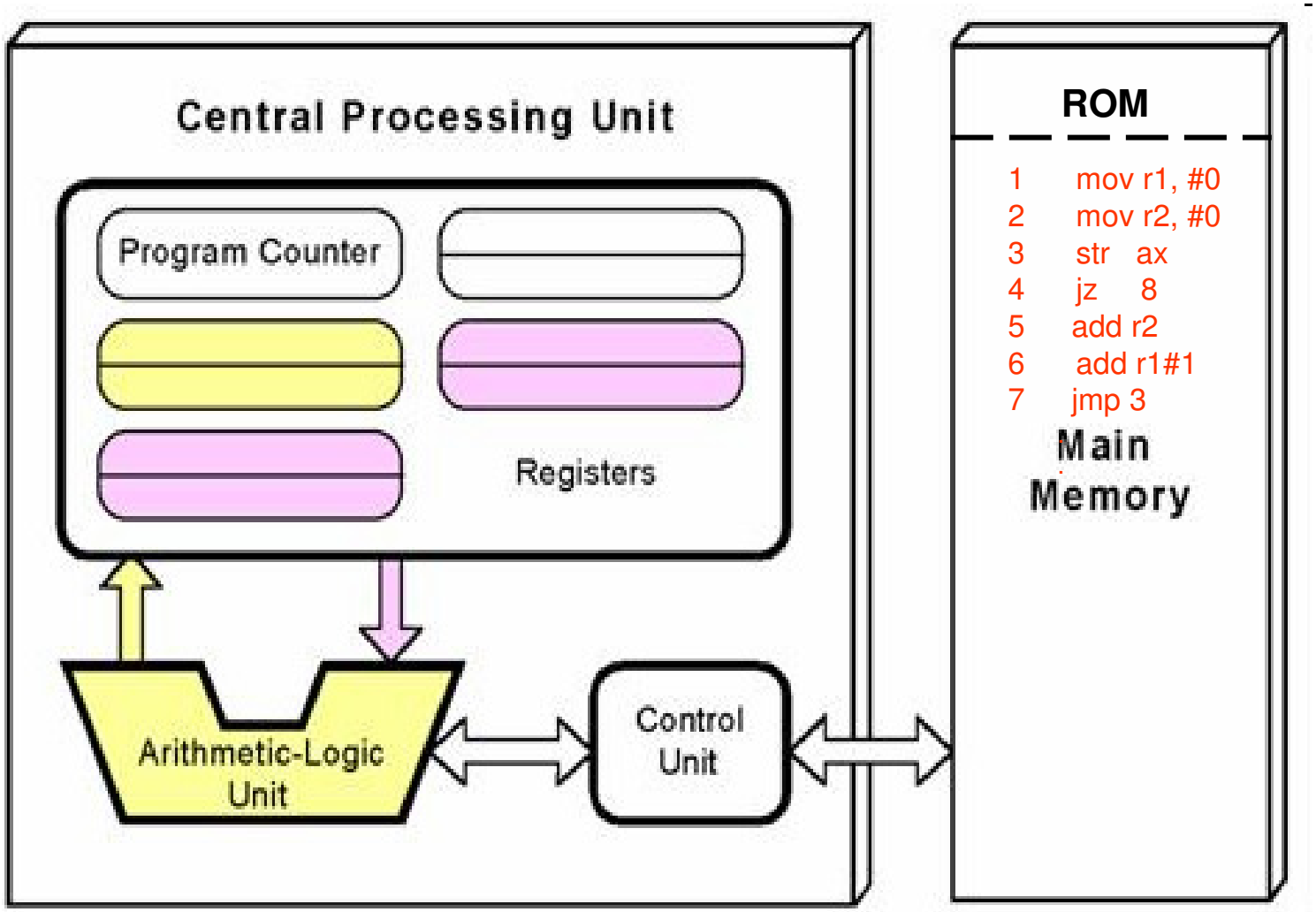
3. “Semántica” Computacional

Ejemplo de programa en Lenguage Assemby:
Cálculo de la media aritmética de varios números

```
1     mov r1, #0
2     mov r2, #0
3     str   ax
4     jz    8          * identificar contenidos, desviar si 0
5     add r2
6     add r1, #1
7     jmp 3
8     div r2,r1        * relacionar contenidos
9     int “media arit.= “,r2
10    end
```

3. “Semántica Computacional”

Arquitectura de Von Neumann



3. “Semántica” Computacional

✓ “semántica computacional” sería la capacidad de los programas “agentes inteligentes” de interactuar con diferentes tipos de servicios disponibles en la Web (y no solo con un tipo específico), comprender los mensajes que describen su funcionamiento y permitir utilizar el servicio o recurso.

- Identificar contenidos

  desviar, con base en contenidos
- Relacionar contenidos

3. “Semántica” Computacional

Relaciones externalizadas (en los datos)

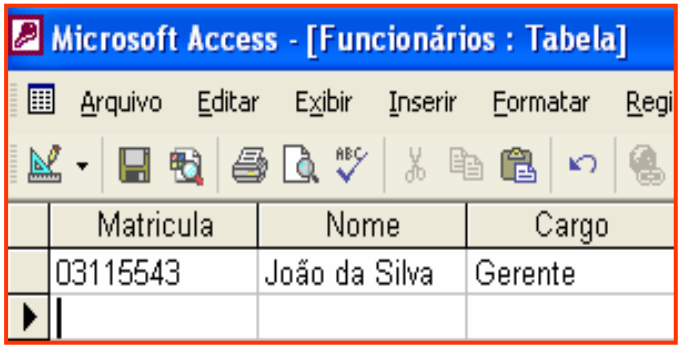


Fig.1 – Tabla de banco de datos de empleados y sus respectivos cargos

-cargo(Juan, Gerente)

Fig.2 – Predicado binário especificando que lo empleado “Juan” tiene el cargo de “Gerente”

3. Semántica Computacional

✓ una “semántica computacional” tendría que ser :

a- inteligible por programas (formal);
b- mínimamente inscrita en el código de los programas; X
c- el máximo disponible públicamente (en la propia Web), consensuada, compartida, estandardizada, y
d- estructurada y basada en RELACIONES EXTERNALIZADAS para permitir “INFERENCIAS”

✓ La propuesta de la WEB SEMÁNTICA!!!

3. “Semántica” Computacional

El rol de las relaciones en la Semántica

> **“No decimos que cada una de las cosas que mencionamos, en si misma e por si misma, sea una afirmación, pero es a través de su combinación unas con las otras por lo que se genera la afirmación. En efecto, toda afirmación es verdadera o falsa pero, entre las cosas que se dicen sin relación entre ellas, ninguna es verdadera o falsa, como por ejemplo hombre, blanco, corre, vence” (ARISTÓTELES, 2000, p. 52).**

3. “Semántica” Computacional

✓ RELACIONES VALIDAS ONTOLOGICAMENTE!!!

¿¿¿ VALIDEZ ONTOLÓGICA ???

- estudiante subclase estudiante univ. *OK!*
- estudiante subclase grado *?*

} La categoria formal determina la validez ontológica

- pistón parte_de motor *OK!*
- potencia parte_de motor *?*

} La relación partitiva formal determina la validez ontológica

- la manzana es roja *OK!*
- la roja es manzana *?*

} La categoria formal determina la validez ontológica

- el juez pronunció la sentencia *OK!*
- la testigo pronunció la sentencia ?

} El rol determina la validez ontológica

- lo jugador chutó la pelota *OK!*
- la pelota chutó al jugador *?*

} El nivel de existencia determina la validez ontológica (GNOLI, 2008)

3. “Semántica” Computacional

¿¿¿ VALIDEZ ONTOLÓGICA ???

HERRAMIENTAS PARA LA ANALISIS ONTOLOGICA:

Teorias:

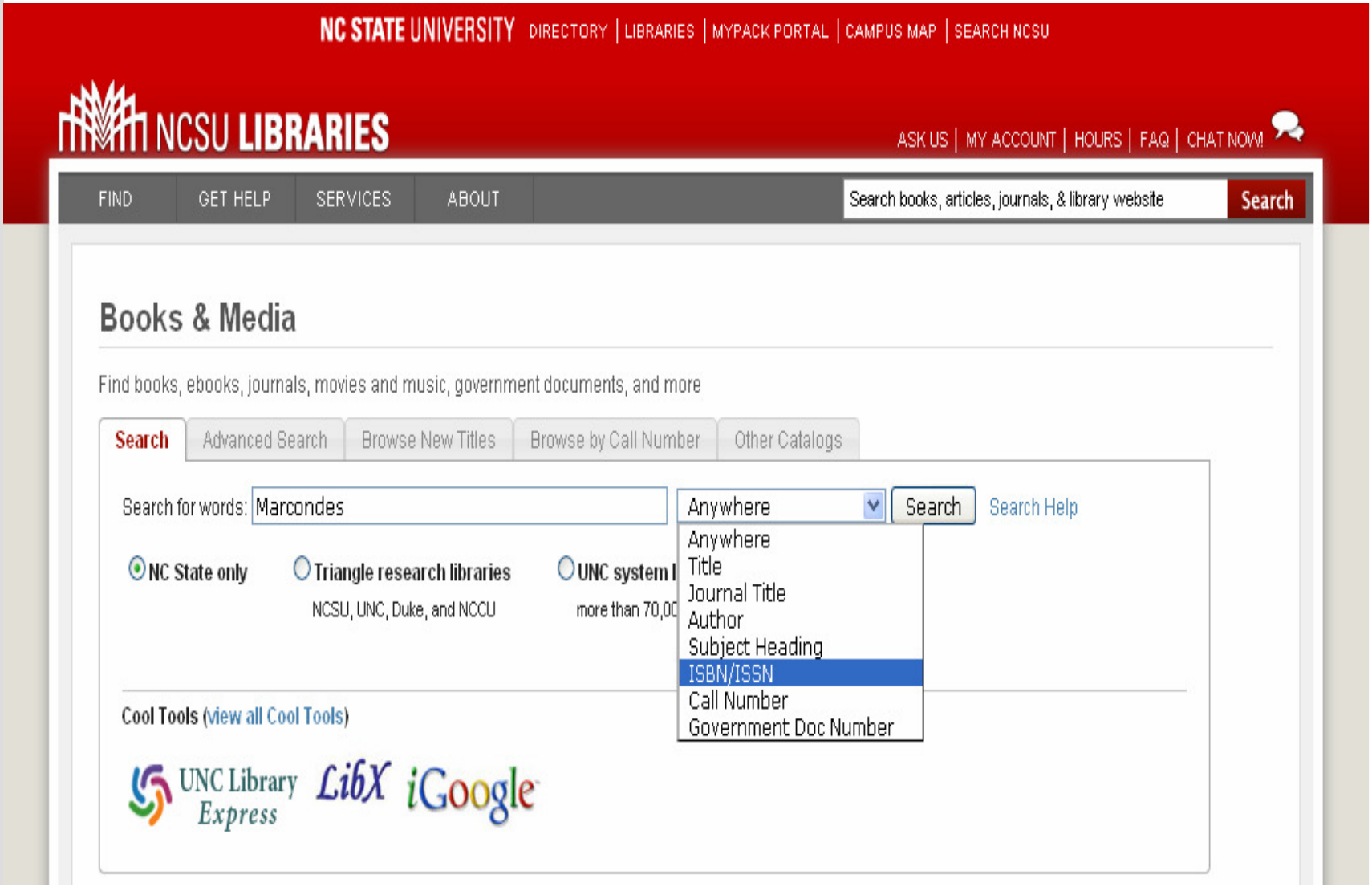
Identidad

Parte/Todo, Integralidad

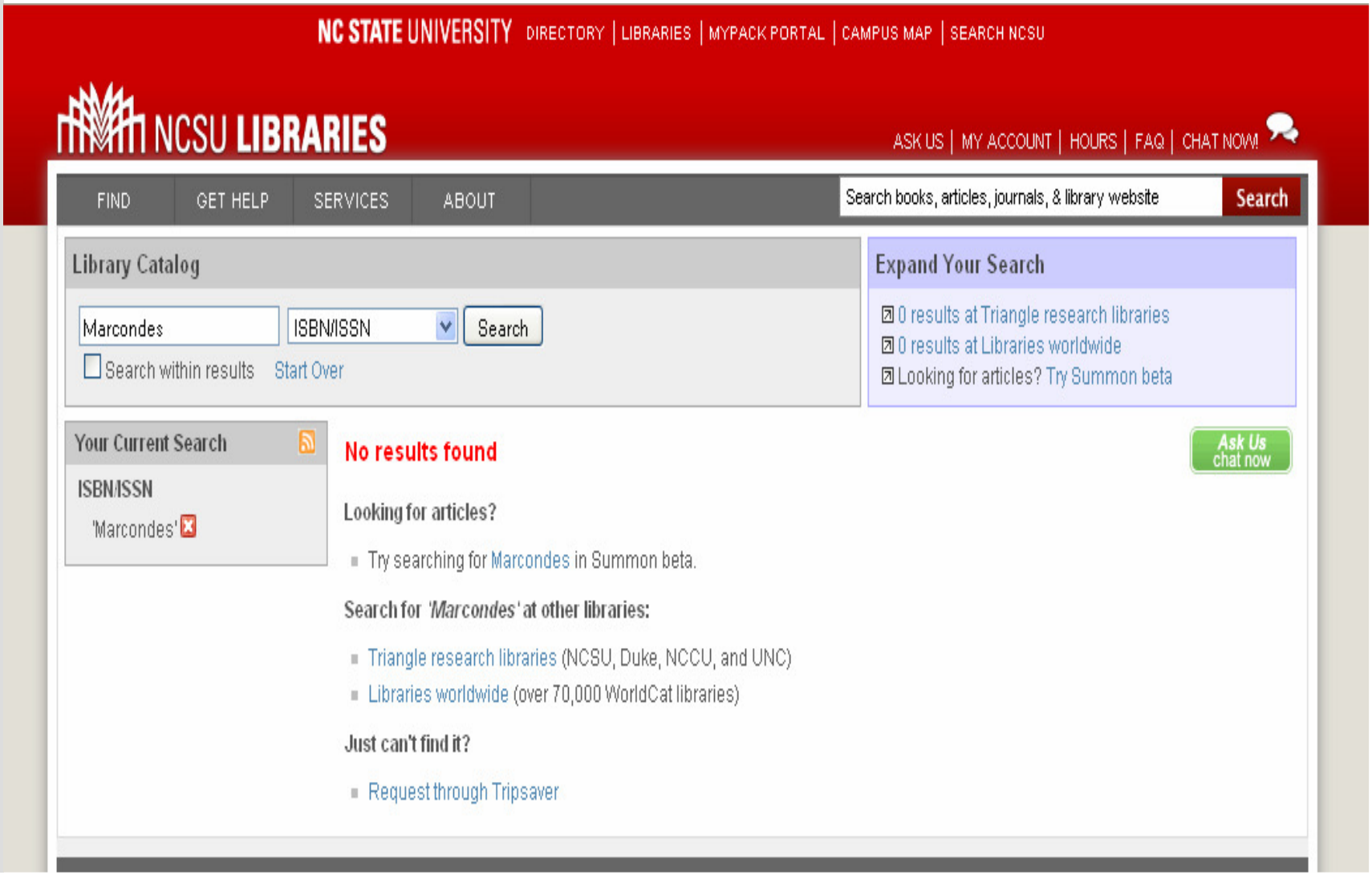
Dependencia

(GUARINO, 1997)

3. “Semántica” Computacional



3. “Semántica” Computacional



3. “Semántica” Computacional

Recursos informacionales em la Web

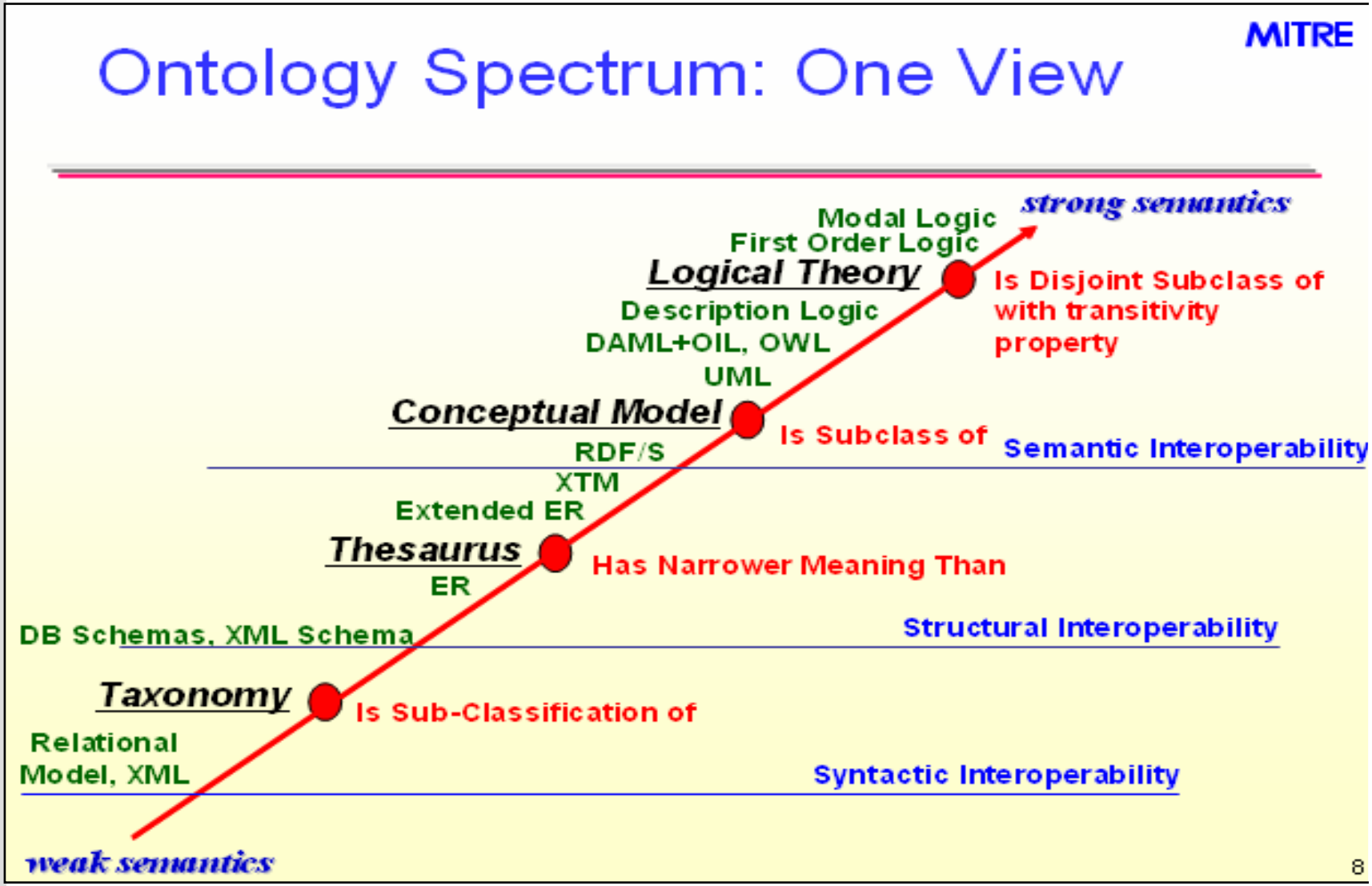
Descoberta: onde estão estes recursos?

Fragmentação em sistemas distintos, não interoperáveis – barreiras de “hardware”, “software”, formatos de arquivo

Mesma entidade tem semânticas distintas, locais, em sistemas distintos. Como integrar estes dados?

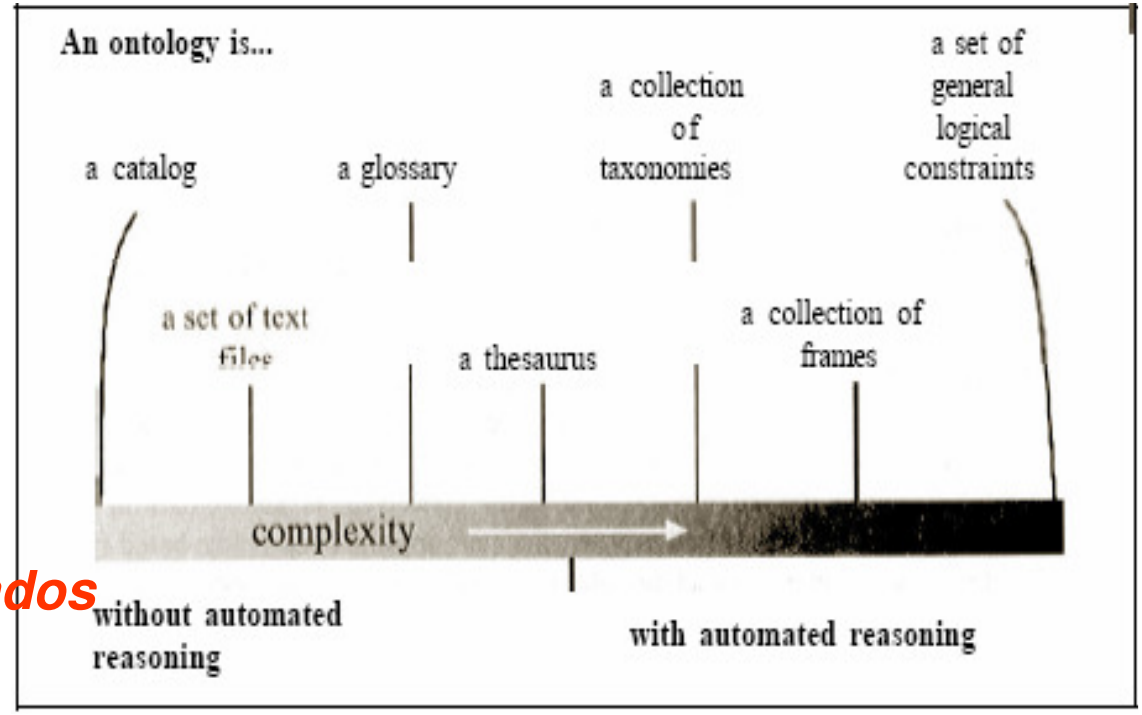
Cliente (Sistema de Saúde privado)
Paciente (Registro médico)
Usuários (SUS)
Beneficiários (Saúde Suplementar)
Notificação (Registro epidemiológico)

Expresividad semántica de los SOCs



Sistemas de Organización del Conocimiento, ordenados según su expressividad semántica. Retirado de Obrst (2010)

Expresividad semántica de los SOCs



SMITH, 2001, p. 5

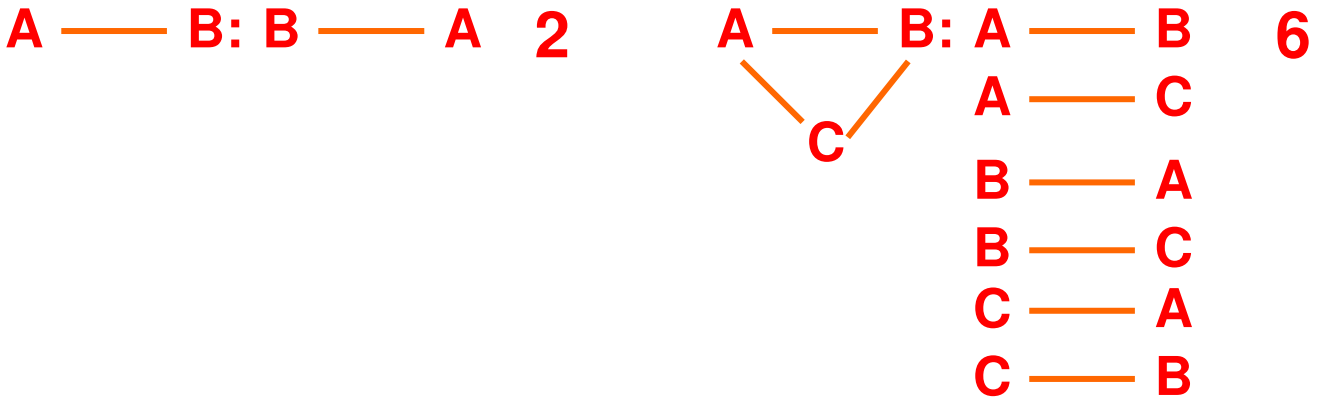
-

- *Vocabularios Controlados*
- *Términos/Glosários*
- *Tesauros*
- *Jerarquías Informales (ex. Yahoo)*
- *Jerarquías Formales*
- *Jerarquías de Clases con propiedades (Frames)*
- *Ontologías con restricciones de valores*
- *Ontologías con restricciones lógicas*

+

3. “Semántica” computacional

✓ **Expresividad “semántica”:= ctde. de diferentes tipos de proposiciones/relaciones que es posible hacer**



3. Semántica Computacional

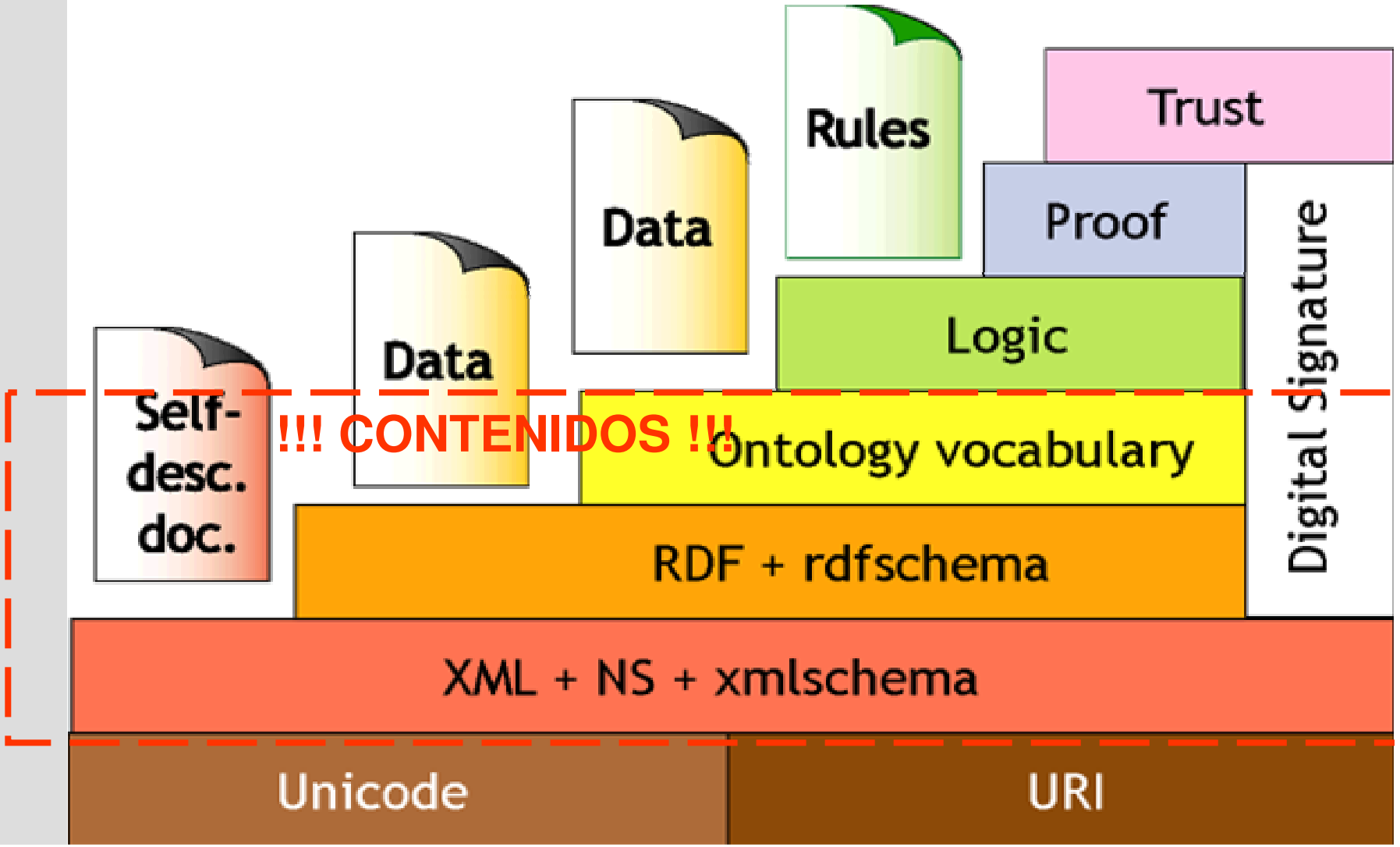
Lógica Formal - inferencia

- “Todo o homem é mortal;
- Sócrates é homem;
- portanto, Sócrates é mortal”

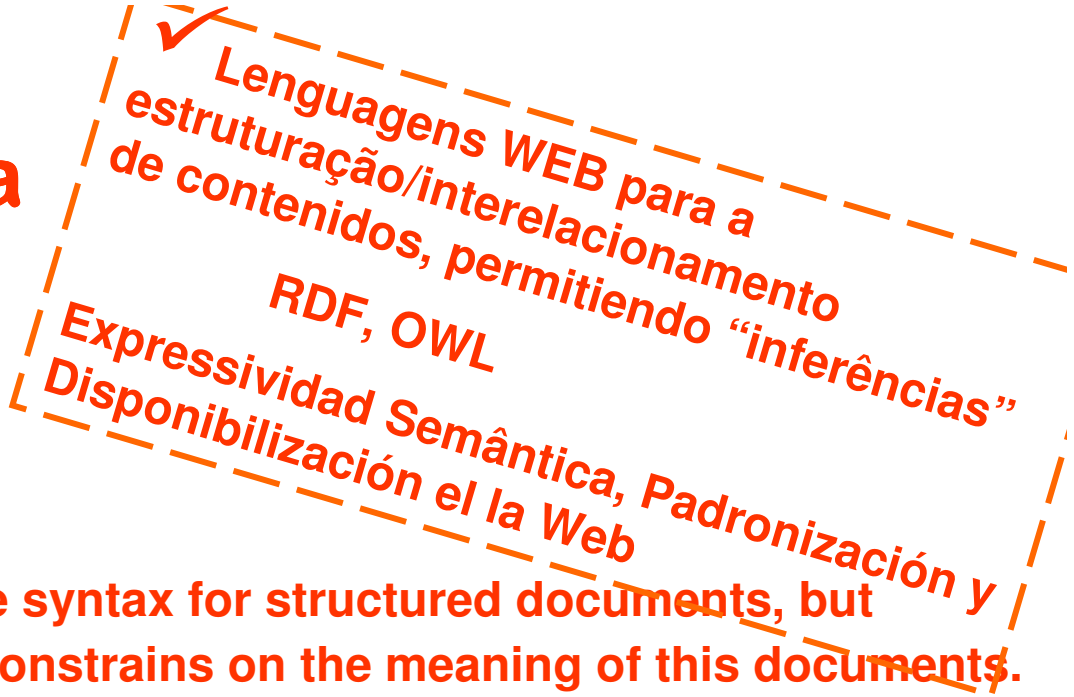
-“Todo A é X;
- a é A;
- portanto, a é X”

✓ Relacionar: CÓDIGO
✓ Contenidos: ESTRUTURADOS, EXTERNALIZADOS, ESTANDARDIZADOS!!!

4. Web Semántica



4. Web Semántica



- XML provides a surface syntax for structured documents, but imposes no semantic constrains on the meaning of this documents.
- XML Schema is a language for restricting the structure of XML documents and also extends XML with datatype.
- RDF is a datamodel for objects ("resources") and relations between them, provides a simple semantic for this datamodel, and this datamodels can be represented in an XML syntax."
- RDF Schema is a vocabulary for describing properties and classes with a semantic for generalization-hierarchies of such properties and classes.
- OWL adds more vocabulary for describing properties and classes: among others, relations between classes (e.g. disjointness) cardinality (e.g. "exactly one"), equality, richer typing of properties, characteristics of properties (e.g. symmetry), and enumerated classes. (OWL Ontology Web Language Overview, 2004. p.3).

4. Web Semántica - estándares

- ✓ **Expresividad "semántica" – RDF (Resource Description Framework)**

  "El creador de la página http://www.uff.br/gdo/htm/index.htm es Carlos Marcondes"

```
<?xml version="1.0">
<rdf:RDF
   xmlns= http://www.w3.org/1999/02/22-rdf-syntax-ns
   xmlns:dc="http://purl.org/dc/elements/1.1">
   <rdf:Description rdf:about
            "http://www.uff.br/gdo/htm/index.htm">
            <dc:creator>MARCONDES, Carlos</dc:creator>
   </rdf:Description>
</rdf:RDF>
```

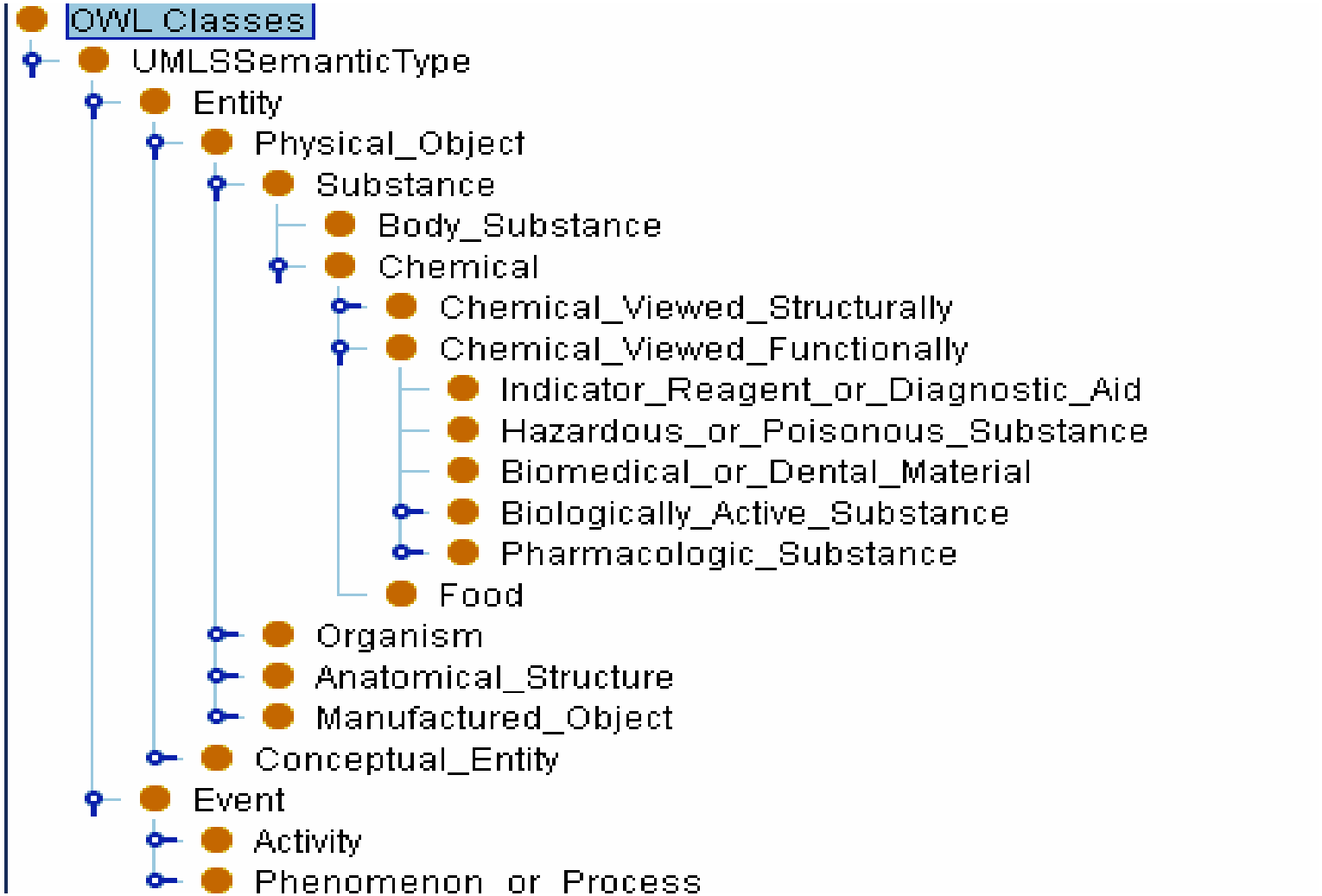
4. Web Semántica – estándares

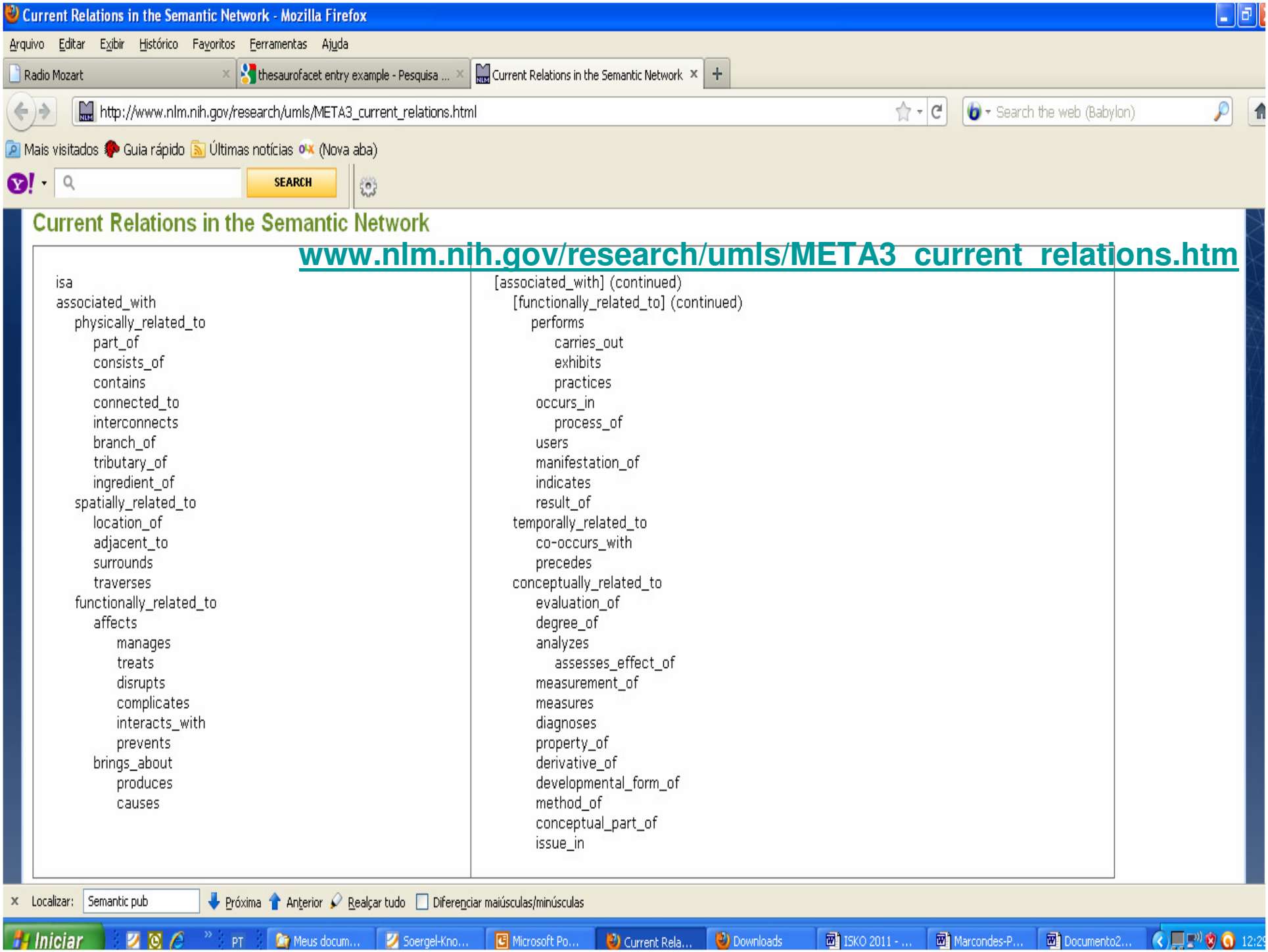
- ✓ **Expresividad "semántica" – OWL (Ontology Web Language)**

```
<rdfs:Class rdf:ID="Veículos-a-motor>
        <owl:onProperty rdf:resource="#motor"/>
         <owl:onProperty rdf:resource="#carroceira"/>
         <owl:onProperty rdf:resource="#chassis"/>
        <owl:onProperty rdf:resource="#marca"/>
</rdfs:Class>
<rdfs:Class rdf:ID="Veículos-passageiros>
        <owl:onProperty rdf:resource="#capacidade-passageiros"/>
</rdfs:Class>
<rdfs:Class rdf:ID="Van>
        <rdfs:subClassOf rdf:resorce=Veículos-a-motor>
        </rdfs:Class>
<rdfs:Class rdf:ID="Autobus>
        <rdfs:subClassOf rdf:resorce=Veículos-a-motor>
</rdfs:Class>
<rdfs:Class rdf:ID="Caminhão>
        <rdfs:subClassOf rdf:resorce=Veículos-a-motor>
</rdfs:Class>
<rdfs:Class rdf:ID="MiniVan>
        <rdfs:subClassOf rdf:resorce=Veículos-passageiro>
</rdfs:Class>
```

UMLS Semantic Network

http://www.nlm.nih.gov/pubs/factsheets/umlssemn.html




Current Relations in the Semantic Network - Mozilla Firefox
Arquivo Editar Exibir Histórico Favoritos Ferramentas Ajuda
Radio Mozart
thesaurofacet entry example - Pesquisa ...
Current Relations in the Semantic Network
http://www.nlm.nih.gov/research/umls/META3_current_relations.html
Search the web (Babylon)
Mais visitados Guia rápido Últimas notícias (Nova aba)
SEARCH
Current Relations in the Semantic Network
www.nlm.nih.gov/research/umls/META3_current_relations.htm
isa
associated_with
physically_related_to
part_of
consists_of
contains
connected_to
interconnects
branch_of
tributary_of
ingredient_of
spatially_related_to
location_of
adjacent_to
surrounds
traverses
functionally_related_to
affects
manages
treats
disrupts
complicates
interacts_with
prevents
brings_about
produces
causes
[associated_with] (continued)
[functionally_related_to] (continued)
performs
carries_out
exhibits
practices
occurs_in
process_of
users
manifestation_of
indicates
result_of
temporally_related_to
co-occurs_with
precedes
conceptually_related_to
evaluation_of
degree_of
analyzes
assesses_effect_of
measurement_of
measures
diagnoses
property_of
derivative_of
developmental_form_of
method_of
conceptual_part_of
issue_in
Localizar: Semantic pub
Próxima Anterior Realçar tudo Diferenciar maiúsculas/minúsculas
Iniciar
PT
Meus docum...
Soergel-Kno...
Microsoft Po...
Current Rela...
Downloads
ISKO 2011 - ...
Marcondes-P...
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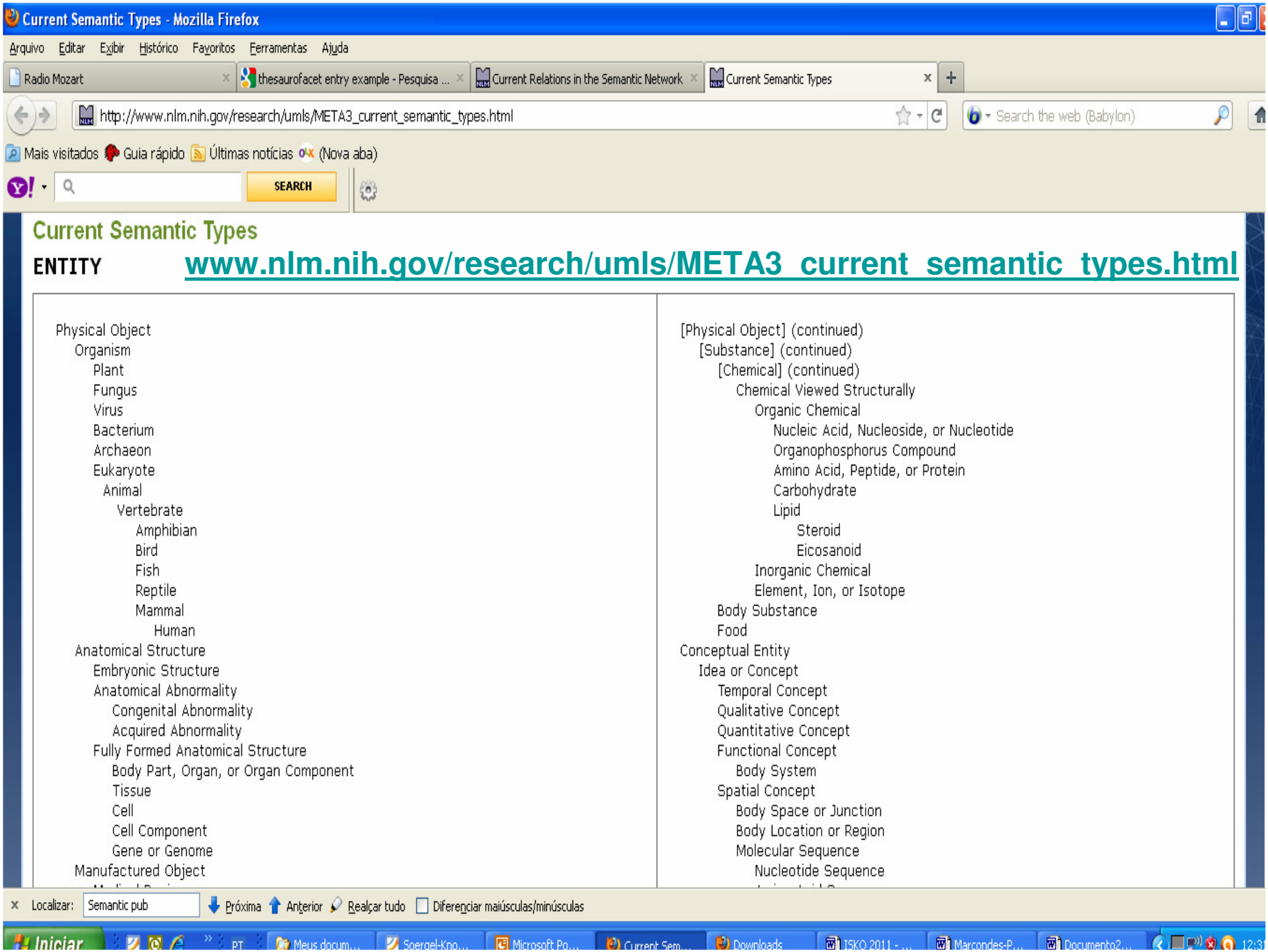
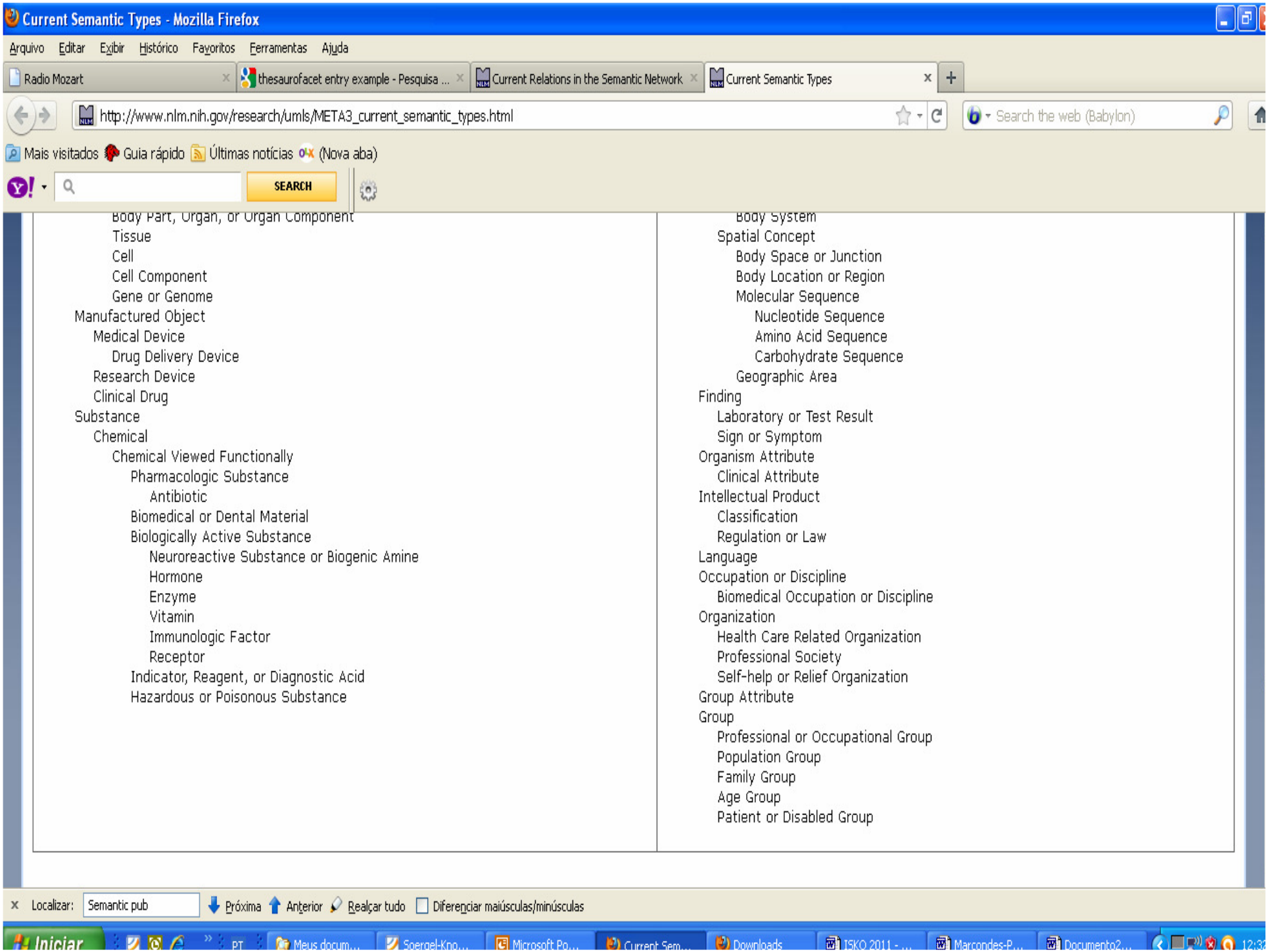
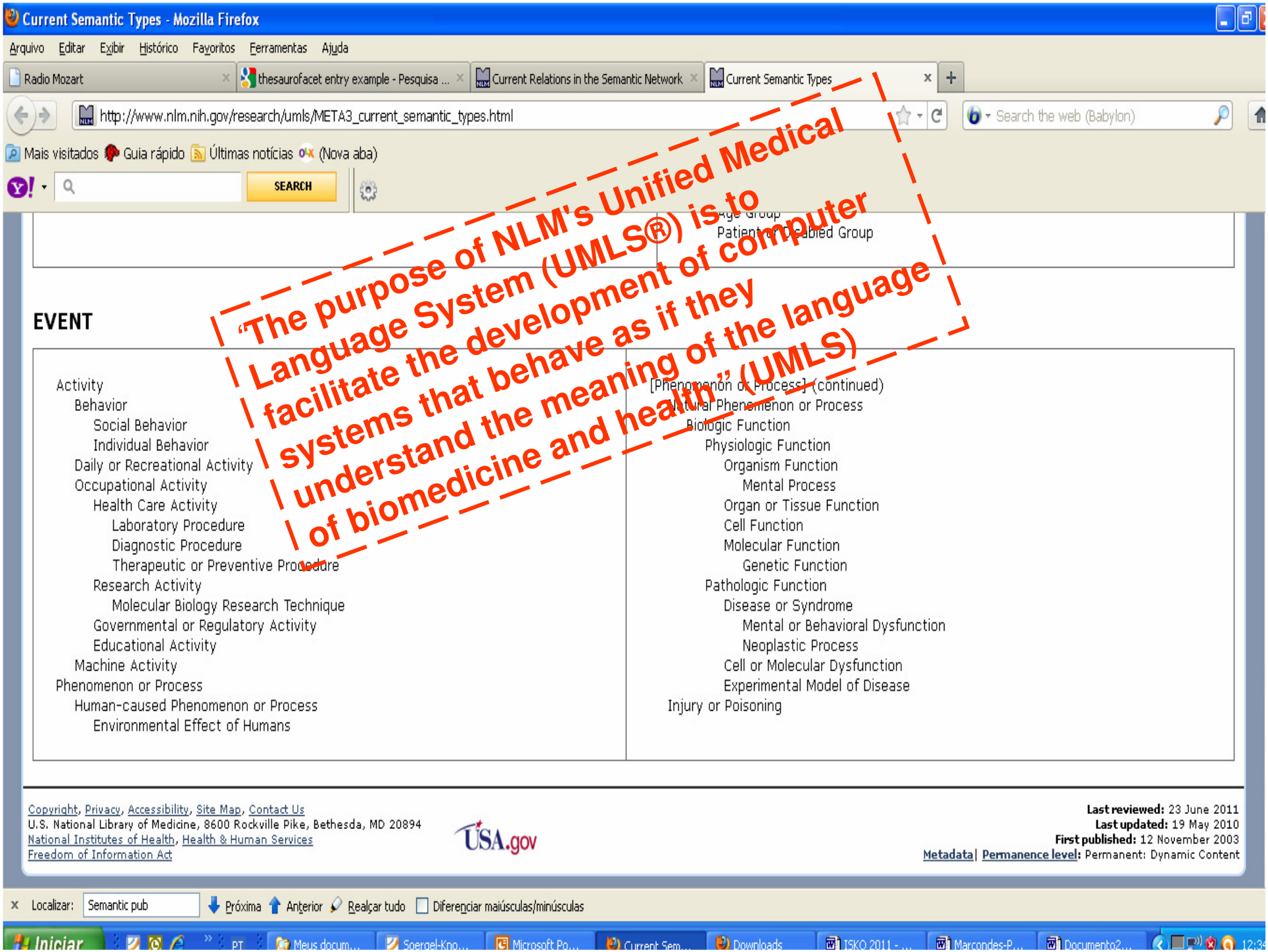

Current Semantic Types - Mozilla Firefox
Arquivo Editar Exibir Histórico Favoritos Ferramentas Ajuda
Radio Mozart
thesaurofacet entry example - Pesquisa ...
Current Relations in the Semantic Network
Current Semantic Types
http://www.nlm.nih.gov/research/umls/META3_current_semantic_types.html
Search the web (Babylon)
Mais visitados Guia rápido Últimas notícias (Nova aba)
SEARCH
Current Semantic Types
ENTITY
www.nlm.nih.gov/research/umls/META3_current_semantic_types.html
Physical Object
Organism
Plant
Fungus
Virus
Bacterium
Archaeon
Eukaryote
Animal
Vertebrate
Amphibian
Bird
Fish
Reptile
Mammal
Human
Anatomical Structure
Embryonic Structure
Anatomical Abnormality
Congenital Abnormality
Acquired Abnormality
Fully Formed Anatomical Structure
Body Part, Organ, or Organ Component
Tissue
Cell
Cell Component
Gene or Genome
Manufactured Object
[Physical Object] (continued)
[Substance] (continued)
[Chemical] (continued)
Chemical Viewed Structurally
Organic Chemical
Nucleic Acid, Nucleoside, or Nucleotide
Organophosphorus Compound
Amino Acid, Peptide, or Protein
Carbohydrate
Lipid
Steroid
Eicosanoid
Inorganic Chemical
Element, Ion, or Isotope
Body Substance
Food
Conceptual Entity
Idea or Concept
Temporal Concept
Qualitative Concept
Quantitative Concept
Functional Concept
Body System
Spatial Concept
Body Space or Junction
Body Location or Region
Molecular Sequence
Nucleotide Sequence
Localizar: Semantic pub
Próxima Anterior Realçar tudo Diferenciar maiúsculas/minúsculas
Iniciar


Current Semantic Types - Mozilla Firefox
Arquivo Editar Exibir Histórico Favoritos Ferramentas Ajuda
Radio Mozart
thesaurofacet entry example - Pesquisa ...
Current Relations in the Semantic Network
Current Semantic Types
http://www.nlm.nih.gov/research/umls/META3_current_semantic_types.html
Search the web (Babylon)
Mais visitados Guia rápido Últimas notícias (Nova aba)
SEARCH
Body Part, Organ, or Organ Component
Tissue
Cell
Cell Component
Gene or Genome
Manufactured Object
Medical Device
Drug Delivery Device
Research Device
Clinical Drug
Substance
Chemical
Chemical Viewed Functionally
Pharmacologic Substance
Antibiotic
Biomedical or Dental Material
Biologically Active Substance
Neuroreactive Substance or Biogenic Amine
Hormone
Enzyme
Vitamin
Immunologic Factor
Receptor
Indicator, Reagent, or Diagnostic Acid
Hazardous or Poisonous Substance
Body System
Spatial Concept
Body Space or Junction
Body Location or Region
Molecular Sequence
Nucleotide Sequence
Amino Acid Sequence
Carbohydrate Sequence
Geographic Area
Finding
Laboratory or Test Result
Sign or Symptom
Organism Attribute
Clinical Attribute
Intellectual Product
Classification
Regulation or Law
Language
Occupation or Discipline
Biomedical Occupation or Discipline
Organization
Health Care Related Organization
Professional Society
Self-help or Relief Organization
Group Attribute
Group
Professional or Occupational Group
Population Group
Family Group
Age Group
Patient or Disabled Group
Localizar: Semantic pub
Próxima Anterior Realçar tudo Diferenciar maiúsculas/minúsculas
Iniciar



'The purpose of NLM's Unified Medical Language System (UMLS®) is to facilitate the development of computer systems that behave as if they understand the meaning of the language of biomedicine and health" (UMLS)

Publicaciones semánticas
Al autor se le pide entrar en la conclusión

Indicate the Conclusion

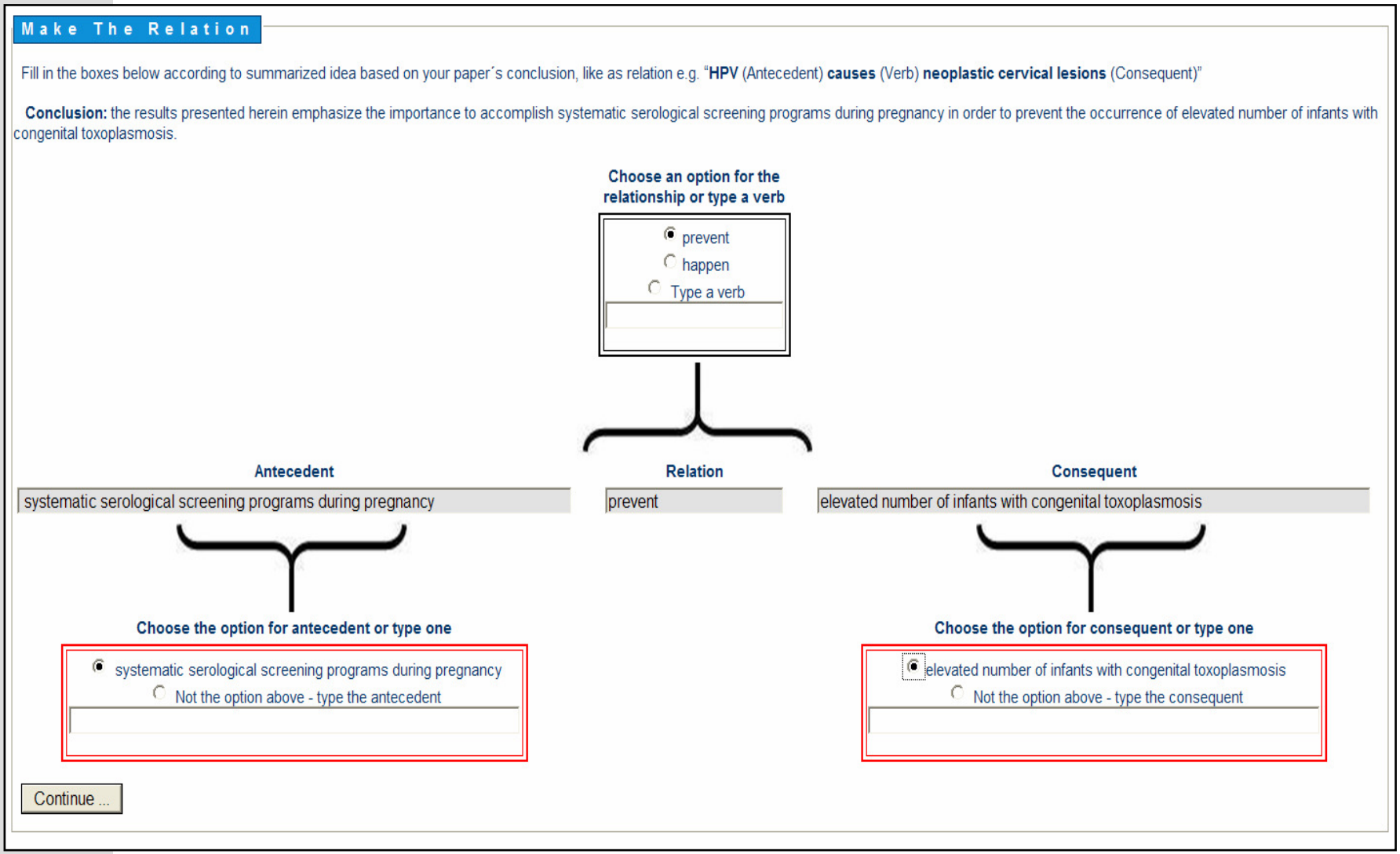
Write the conclusion briefly below.

- The conclusion should provide a comprehensive summary (less than 50 words).
- The conclusion should clearly answer the questions posed if applicable.
- The conclusion should not introduce any information or ideas yet described in your article.
- **If it exists several conclusions the main it should be chosen**
- Provide the conclusion which was only directly supported by the results.
- **Avoid speculation, overgeneralization, supposition and don't create a hypothesis.**
- Avoid sentences among commas and parentheses.
- Avoid explanations between commas and parentheses.
- Describe the main finding only. **Ideally, it should be only one sentence in length (less than 50 words).**

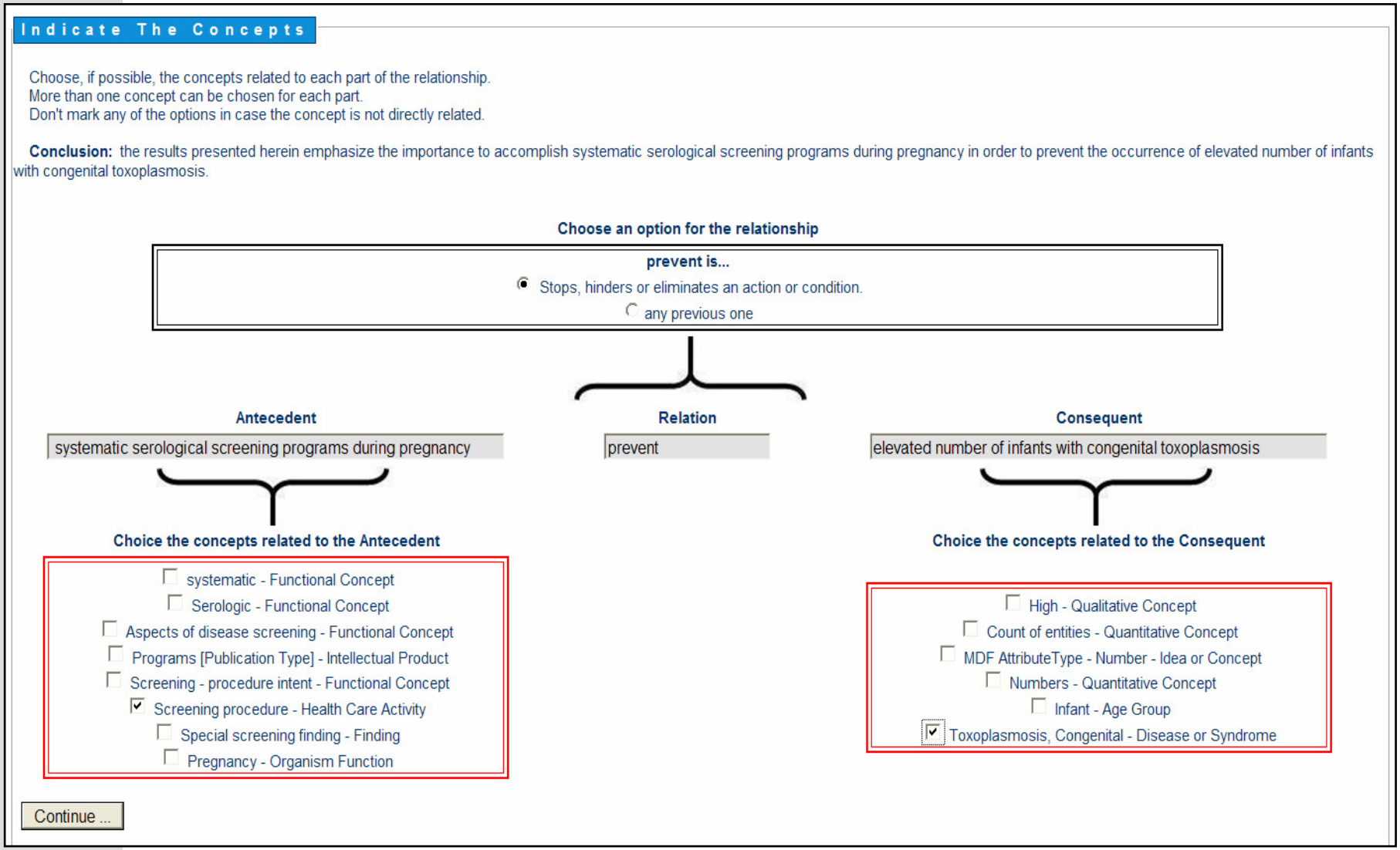
the results presented herein emphasize the importance to accomplish systematic serological screening programs during pregnancy in order to prevent the occurrence of elevated number of infants with congenital toxoplasmosis.

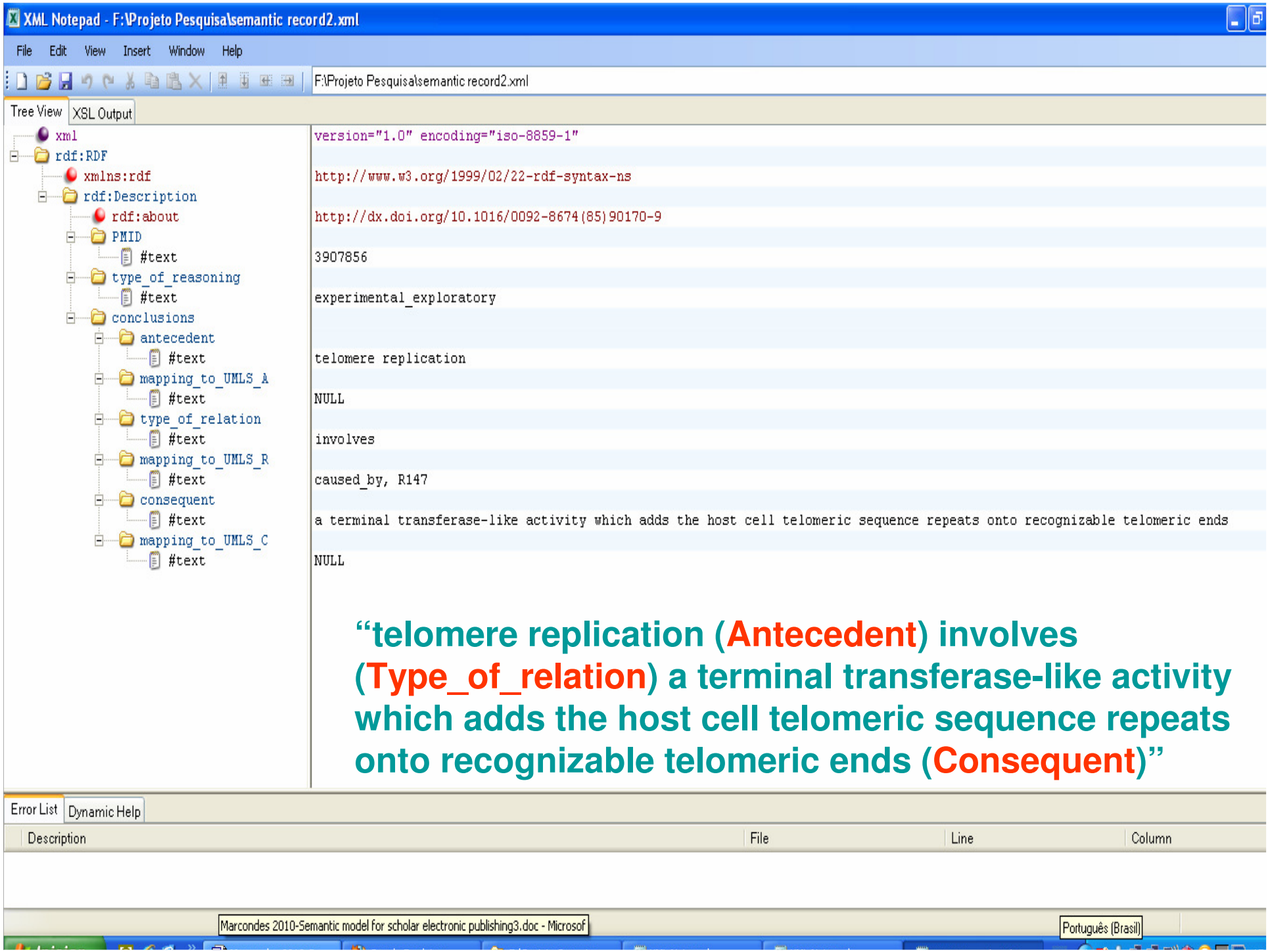
Continue ...

Publicaciones semánticas
La conclusión está formateada como una relación



Publicaciones semánticas
Al autor se le pide que mapee los conceptos de la conclusion en terminos de la UMLS




XML Notepad - F:\Projeto Pesquisa\semantic record2.xml
File Edit View Insert Window Help
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xml
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rdf:Description
rdf:about
PMID
#text
type_of_reasoning
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conclusions
antecedent
#text
mapping_to_UMLS_A
#text
type_of_relation
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mapping_to_UMLS_R
#text
consequent
#text
mapping_to_UMLS_C
#text
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http://www.w3.org/1999/02/22-rdf-syntax-ns
http://dx.doi.org/10.1016/0092-8674(85)90170-9
3907856
experimental_exploratory
telomere replication
NULL
involves
caused_by, R147
a terminal transferase-like activity which adds the host cell telomeric sequence repeats onto recognizable telomeric ends
NULL
"telomere replication (Antecedent) involves (Type_of_relation) a terminal transferase-like activity which adds the host cell telomeric sequence repeats onto recognizable telomeric ends (Consequent)"
Error List Dynamic Help
Description File Line Column
Marcondes 2010-Semantic model for scholar electronic publishing3.doc - Microsof
Português (Brasil)

Recuperación semántica

- - Which other articles have hypotheses suggesting HPV (antecedent) as the cause (type_of_relation) of cervical neoplasias (consequent) in women? Which of those have proven hypotheses?
- - Which articles have hypotheses suggesting other (antecedent ?) causes (type_of_relation) to cervical neoplasias (consequent) different from HPV in women?
- - Which articles have hypotheses suggesting HPV (antecedent) as the cause (type_of_relation) of other pathologies (consequent ?) different from neoplasias?
- - Which experimental-inductive articles propose (antecedent ?) causes (type_of_relation) to cellular senescence (consequent) which are not-mapped to UMLS concepts?
- - Who and when first maintained that "*the RNA component of telomerase* (antecedent) *may be directly involved* (type_of_relation) *in recognizing the unique three-dimensional structure of the G-rich telomeric oligonucleotide primers* (consequent)" (GREIDER, 1987)?

Triplas RDF – de las bases de datos textuales hasta las bases de conocimiento

http://www.semantic-systems-biology.org/home

Sample queries:

BIO 15. Get the proteins interactors by a given topic and a given disease.

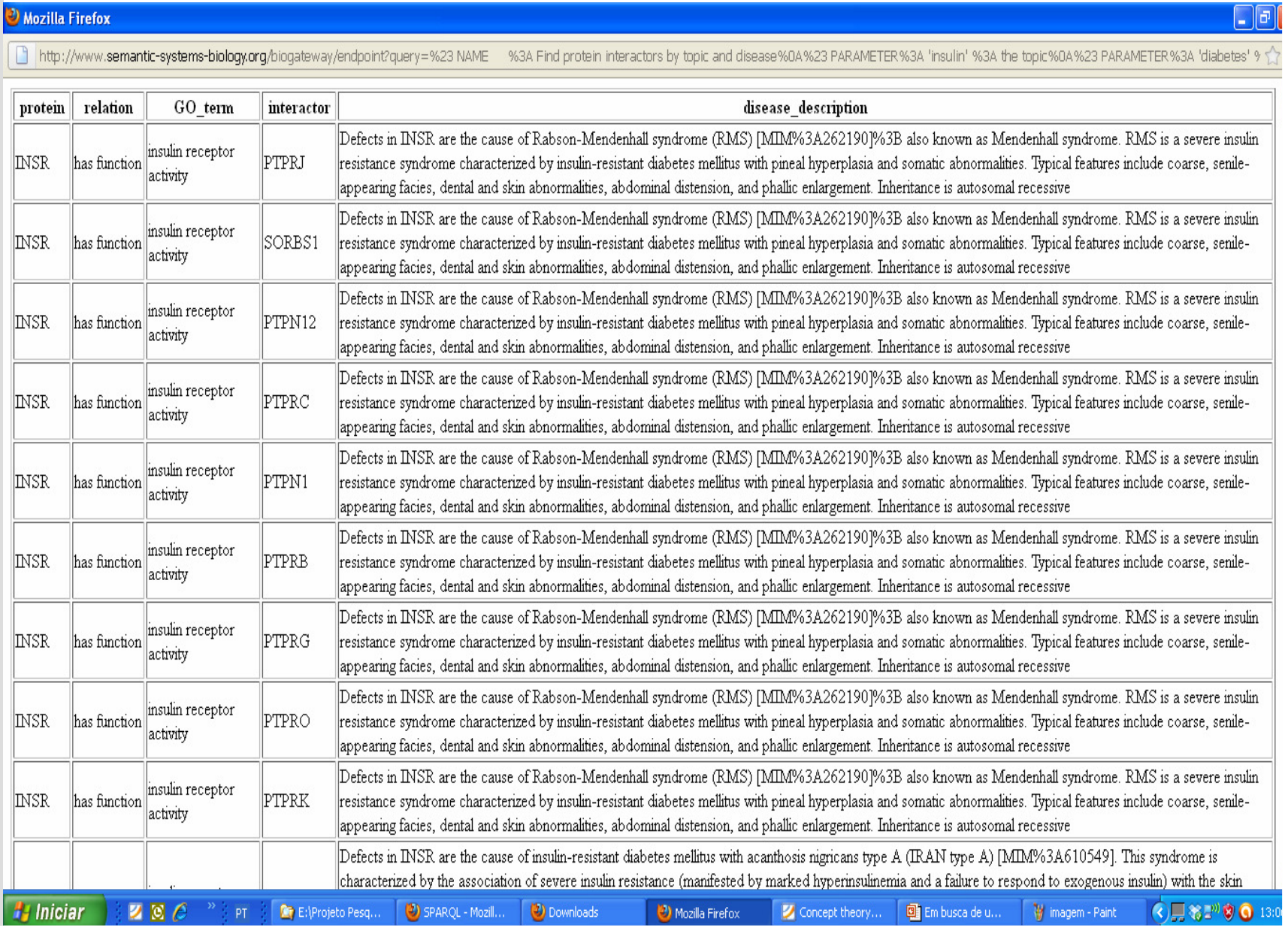
Query:

```
# NAME      : Find protein interactors by topic and disease
# PARAMETER: 'insulin' : the topic
# PARAMETER: 'diabetes' : the disease
# FUNCTION : returns all the proteins and their interactors that
#            are involved in a given disease and a given topic

BASE   <http://www.semantic-systems-biology.org/>
PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
PREFIX ssb:<http://www.semantic-systems-biology.org/SSB#>
SELECT distinct ?protein ?relation ?GO_term ?interactor
?disease_description
WHERE {
  GRAPH <gene_ontology_edit> {
    ?GO_id rdfs:label ?GO_term.
  }
  GRAPH <25.H_sapiens> {
    ?protein_id ?relation_id ?GO_id.
    ?protein_id rdfs:label ?protein.
    ?relation_id rdfs:label ?relation.
    ?interactor_id rdfs:label ?interactor.
  }
  GRAPH <uniprot_sprot> {
    ?protein_id ssb:disease ?disease_description.
    OPTIONAL {
      ?protein_id ssb:interacts_with ?interactor_id.
    }
  }
  FILTER regex(str(?GO_term), 'insulin')
  FILTER regex(str(?disease_description), 'diabetes').
}
```

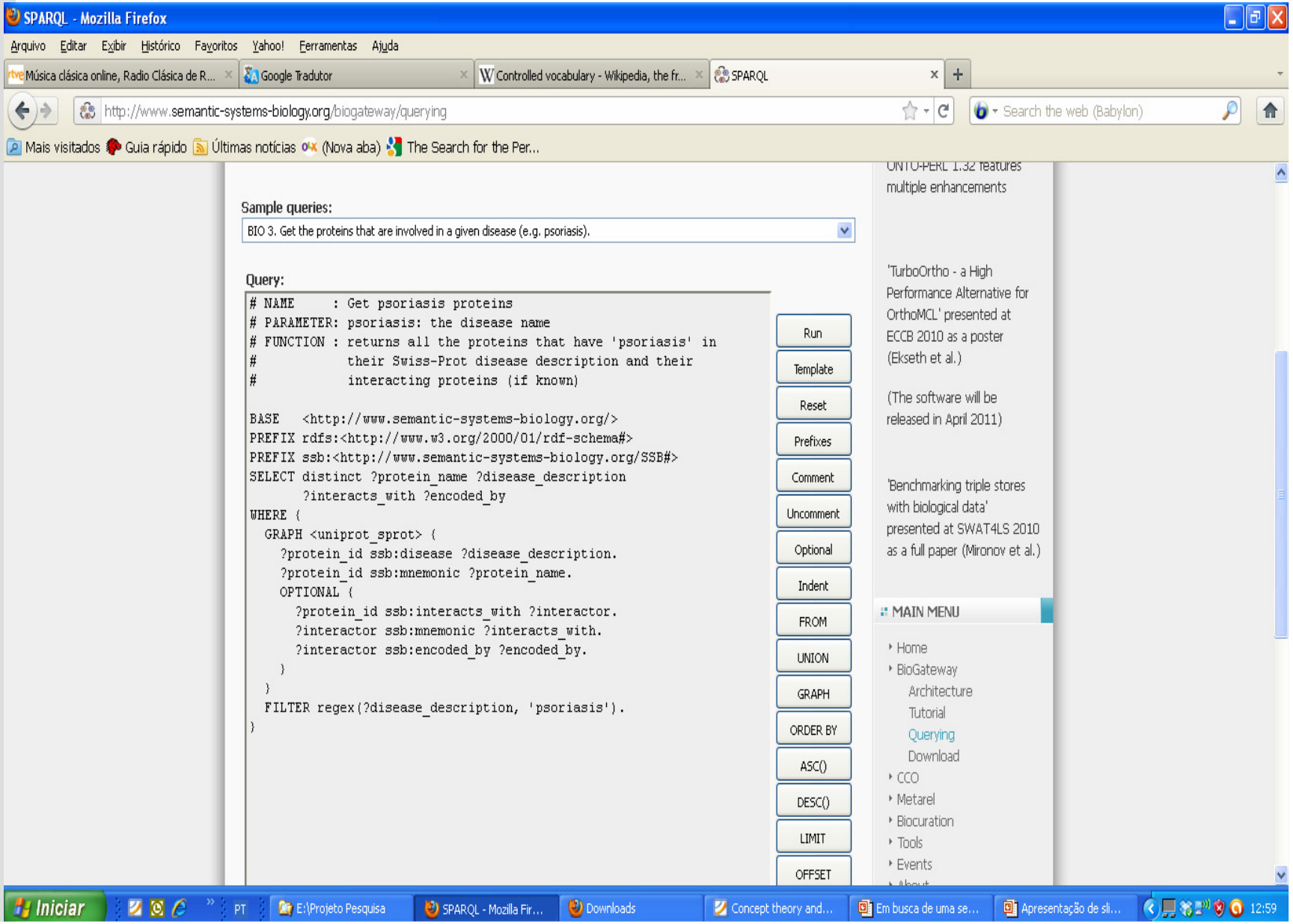
Run
Template
Reset
Prefixes
Comment
Uncomment
Optional
Indent
FROM
UNION
GRAPH
ORDER BY
ASC()
DESC()
LIMIT

Triplas RDF – de las bases de datos textuales hasta las bases de conocimiento

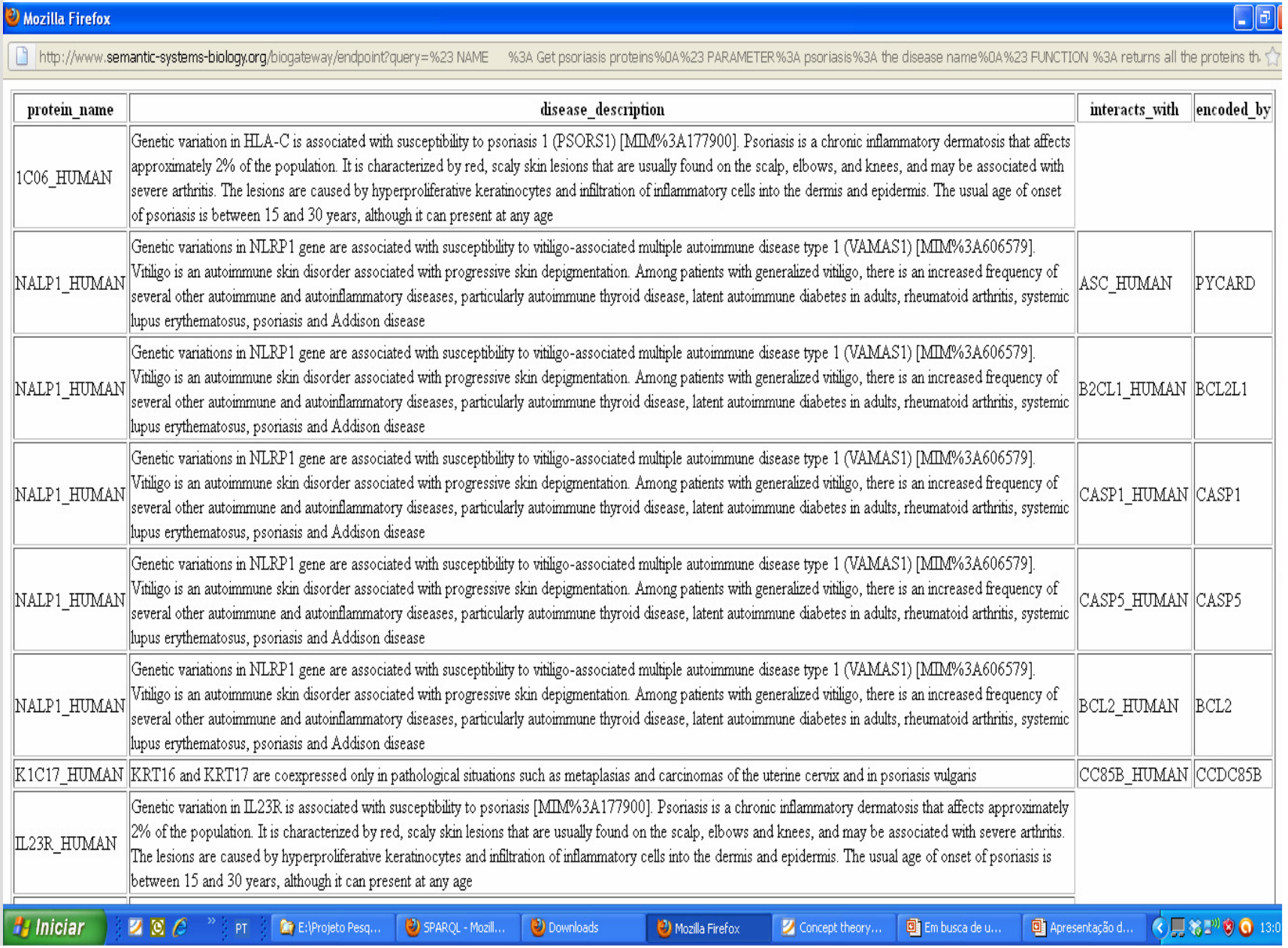


protein	relation	GO_term	interactor	disease_description
INSR	has function	insulin receptor activity	PTPRJ	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	SORBS1	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPN12	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPRC	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPN1	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPRB	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPRG	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPRO	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
INSR	has function	insulin receptor activity	PTPRK	Defects in INSR are the cause of Rabson-Mendenhall syndrome (RMS) [MIM%3A262190]%3B also known as Mendenhall syndrome. RMS is a severe insulin resistance syndrome characterized by insulin-resistant diabetes mellitus with pineal hyperplasia and somatic abnormalities. Typical features include coarse, senile-appearing facies, dental and skin abnormalities, abdominal distension, and phallic enlargement. Inheritance is autosomal recessive
				Defects in INSR are the cause of insulin-resistant diabetes mellitus with acanthosis nigricans type A (IRAN type A) [MIM%3A610549]. This syndrome is characterized by the association of severe insulin resistance (manifested by marked hyperinsulinemia and a failure to respond to exogenous insulin) with the skin

Triplas RDF – de las bases de datos textuales hasta las bases de conocimiento



Triplas RDF – de las bases de datos textuales hasta las bases de conocimiento



protein_name	disease_description	interacts_with	encoded_by
1C06_HUMAN	Genetic variation in HLA-C is associated with susceptibility to psoriasis 1 (PSORS1) [MIM%3A177900]. Psoriasis is a chronic inflammatory dermatosis that affects approximately 2% of the population. It is characterized by red, scaly skin lesions that are usually found on the scalp, elbows, and knees, and may be associated with severe arthritis. The lesions are caused by hyperproliferative keratinocytes and infiltration of inflammatory cells into the dermis and epidermis. The usual age of onset of psoriasis is between 15 and 30 years, although it can present at any age		
NALP1_HUMAN	Genetic variations in NLRP1 gene are associated with susceptibility to vitiligo-associated multiple autoimmune disease type 1 (VAMAS1) [MIM%3A606579]. Vitiligo is an autoimmune skin disorder associated with progressive skin depigmentation. Among patients with generalized vitiligo, there is an increased frequency of several other autoimmune and autoinflammatory diseases, particularly autoimmune thyroid disease, latent autoimmune diabetes in adults, rheumatoid arthritis, systemic lupus erythematosus, psoriasis and Addison disease	ASC_HUMAN	PYCARD
NALP1_HUMAN	Genetic variations in NLRP1 gene are associated with susceptibility to vitiligo-associated multiple autoimmune disease type 1 (VAMAS1) [MIM%3A606579]. Vitiligo is an autoimmune skin disorder associated with progressive skin depigmentation. Among patients with generalized vitiligo, there is an increased frequency of several other autoimmune and autoinflammatory diseases, particularly autoimmune thyroid disease, latent autoimmune diabetes in adults, rheumatoid arthritis, systemic lupus erythematosus, psoriasis and Addison disease	B2CL1_HUMAN	BCL2L1
NALP1_HUMAN	Genetic variations in NLRP1 gene are associated with susceptibility to vitiligo-associated multiple autoimmune disease type 1 (VAMAS1) [MIM%3A606579]. Vitiligo is an autoimmune skin disorder associated with progressive skin depigmentation. Among patients with generalized vitiligo, there is an increased frequency of several other autoimmune and autoinflammatory diseases, particularly autoimmune thyroid disease, latent autoimmune diabetes in adults, rheumatoid arthritis, systemic lupus erythematosus, psoriasis and Addison disease	CASP1_HUMAN	CASP1
NALP1_HUMAN	Genetic variations in NLRP1 gene are associated with susceptibility to vitiligo-associated multiple autoimmune disease type 1 (VAMAS1) [MIM%3A606579]. Vitiligo is an autoimmune skin disorder associated with progressive skin depigmentation. Among patients with generalized vitiligo, there is an increased frequency of several other autoimmune and autoinflammatory diseases, particularly autoimmune thyroid disease, latent autoimmune diabetes in adults, rheumatoid arthritis, systemic lupus erythematosus, psoriasis and Addison disease	CASP5_HUMAN	CASP5
NALP1_HUMAN	Genetic variations in NLRP1 gene are associated with susceptibility to vitiligo-associated multiple autoimmune disease type 1 (VAMAS1) [MIM%3A606579]. Vitiligo is an autoimmune skin disorder associated with progressive skin depigmentation. Among patients with generalized vitiligo, there is an increased frequency of several other autoimmune and autoinflammatory diseases, particularly autoimmune thyroid disease, latent autoimmune diabetes in adults, rheumatoid arthritis, systemic lupus erythematosus, psoriasis and Addison disease	BCL2_HUMAN	BCL2
K1C17_HUMAN	KRT16 and KRT17 are coexpressed only in pathological situations such as metaplasias and carcinomas of the uterine cervix and in psoriasis vulgaris	CC85B_HUMAN	CCDC85B
IL23R_HUMAN	Genetic variation in IL23R is associated with susceptibility to psoriasis [MIM%3A177900]. Psoriasis is a chronic inflammatory dermatosis that affects approximately 2% of the population. It is characterized by red, scaly skin lesions that are usually found on the scalp, elbows and knees, and may be associated with severe arthritis. The lesions are caused by hyperproliferative keratinocytes and infiltration of inflammatory cells into the dermis and epidermis. The usual age of onset of psoriasis is between 15 and 30 years, although it can present at any age		

5. Conclusiones y comentarios finales

¿Pueden los ordenadores pensar?

"The Semantic Web, with its neat ontologies and its syllogistic l logic, is a nice vision. However, like many visions that project future benefits but ignore present costs, it requires too much coordination and too much energy to effect in the real world, where deductive logic is less effective a nd shared world view is harder to create than we often want to admit" (SHIRKY, 2003)..

"How can the semantic interpretation of a formal symbol system be made *intrinsic* to the system, rather than just parasitic on the meanings in our heads? How can the meanings of the meaningless symbol tokens, manipulated solely on the basis of their (arbitrary) shapes, be grounded in anything but other meaningless symbols? The problem is analogous to trying to learn Chinese from a Chinese/Chinese dictionary alone"(HARNARD, 1990, p. 335).

5. Comentarios y conclusiones finales

Today's semantic web deals with meaning in a very restricted sense and offers static solutions. This is adequate for many scientific, technical purposes and for business transactions requiring machine-to-machine communication, but does not answer the needs of culture. Science, technology and business are concerned primarily with the latest findings, the state of the art, i.e. the paradigm or dominant world-view of the day. In this context, history is considered non-essential because it deals with things that are out of date.

By contrast, culture faces a much larger challenge, namely, to re-present changes in ways of knowing; changing meanings in different places at a given time (synchronically) and over time (diachronically). Culture is about both objects and the commentaries on them; about a cumulative body of knowledge; about collective memory and heritage. Here, history plays a central role and older does not mean less important or less relevant. (VELTMAN, 2004, p. 2).

5. Comentarios y conclusiones finales

"Too much rhetoric and too little detail make the project of a Semantic Web conceptually muddled. Key concepts such as "semantics", "meaning", "understanding", "comprehension", "information", "knowledge" and "intelligence", generously sprinkled on the literature concerning the Semantic Web, are all misused, used too loosely or just metaphorically. The actual facts are that languages, protocols and ontologies for metadata and metasyntax can allow integration, aggregation, sharing, syndication and querying of heterogeneous but well-circumscribed topic-oriented data, across different databases. Yet there is virtually no "semantics" in this… No meaning or intelligence plays any role in this" (FLORIDI, 09, p. 30).

The problem of whether the machine is alive or not is, for our purposes semanticand we are at liberty to answer it one way or the other as best suits our convenience. As Humpty Dumpty says about some of his more remarkable words: "I pay them extra and make them do what I want." (WIENER, 1988, p. 32).

".[...] toda significação depende de significações prévias elaboradas na linguagem [...]." (DEMO, 2009, p. 2).

"A manipulação ordenada de símbolos poderá no máximo simular a produção e a comunicação de sentido; jamais poderá *realizá-las*" (DUPUY, 1996, p. 40).

"Consciousness has a biological function in animals."(POPPER, 1978, p. 25).

MAC Niterói

Museo de Arte Contemporânea, Niterói, Rio de Janeiro, Brasil

! Gracias !

marcon@vm.uff.br

Muchas gracias a la profesora Maria Antonia Moreno por su ayuda en la revisión/traducción de esta presentación.

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