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# Is Semantic Web Part of the Broadcasting Future?

Jean-Pierre Evain
EBU TECHNICAL


EBU-UER EBU TECHNICAL MEDIA TECHNOLOGY & INNOVATION


# SEMANTIC WEB IN A NUTSHELL

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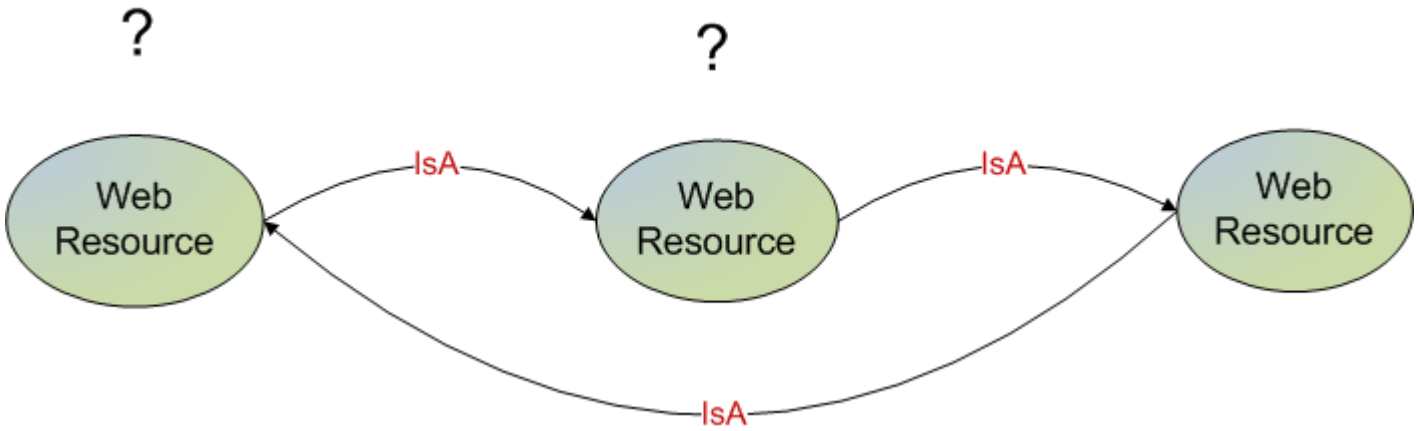
# The Main Concepts

- Adding semantic to the web to help acquiring new knowledge from resource to resource using "ontologies" and "linked data"




- A collection of simple declarations about resources called "triples":

(*subject-predicate/verb-object: 'x' IsA 'y'*)

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# What's new beyond the concept?

- New models, properties, queries
  - Ontologies
- New languages
  - RDF (Resource Description Framework)
  - OWL (Ontology Web Language)
- New representation formats
  - XML, N3, n-Triples, turtle
- New tools
  - Editors, debugger, parsers/validators & 'reasoners', databases, search engines

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# What's the current status?

- Specified since 2004 onwards
- A wide range of existing resources (e.g. medical data, foaf)
- A few attempts to provide descriptions of audiovisual content
  - Description of programmes (RDF statements)
  - Classification of music (ontology), etc.
- Linking data more than developing automatic learning at this stage
- A collection of individual initiatives


# ONTOLOGIES: WHAT DO THEY BRING?

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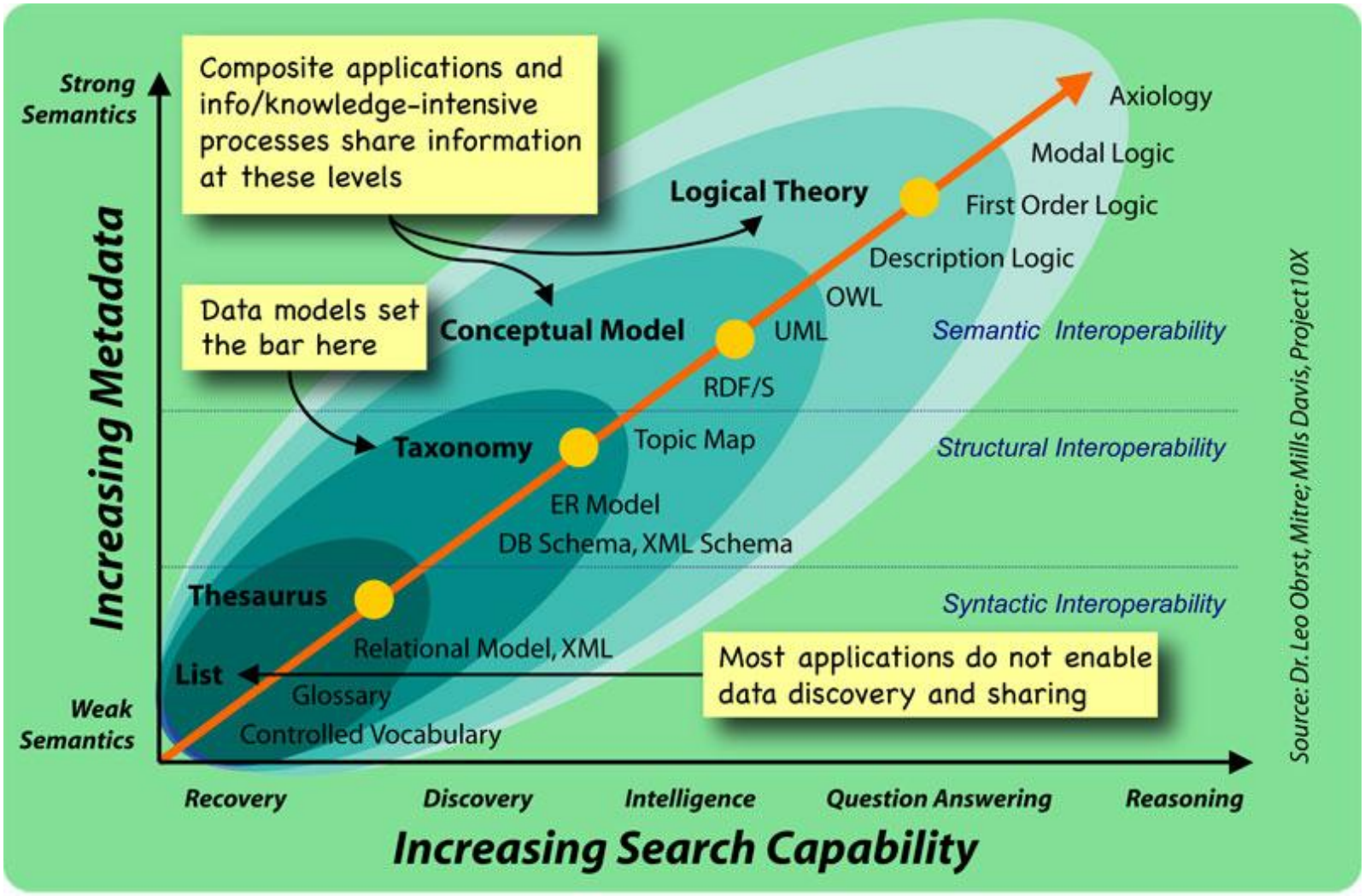
# Increasing search capability






*Courtesy Dr. L.Obrst (Mitre), M.Davis (Project10X)*

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# FIRST STEPS IN IMPLEMENTATION

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# Important basic design considerations

- Ontologies "classes" are uniquely identified web resources
  - Most "business objects" in AV production are eligible as classes:
    - Groups of programmes, programmes, schedule, schedule event, organisations, persons are identified at least once in databases
- Transforming XML into RDF is not enough
- Mastering URIs and namespaces is required

# Simple in "principle" Example: classification

```
<skos:Concept rdf:about="EditorialFormatCodeCS.xml#2.1.2">
  <rdf:type rdf:resource="&owl;Thing"/>
  <skos:broader rdf:resource="EditorialFormatCodeCS.xml#2.1"/>
</skos:Concept>

<skos:Concept rdf:about="ebu_EditorialFormatCodeCS.xml#2.1.2">
  <rdf:type rdf:resource="&owl;Thing"/>
  <skos:prefLabel xml:lang="en">Magazine</skos:prefLabel>
  <skos:narrower rdf:resource="EditorialFormatCodeCS.xml#2.1.2.1"/>
</skos:Concept>

<skos:Concept rdf:about="EditorialFormatCodeCS.xml#2.1.2">
  <rdf:type rdf:resource="&owl;Thing"/>
  <skos:narrower rdf:resource="EditorialFormatCodeCS.xml#2.1.2.2"/>
</skos:Concept>
```

OR

```
<skos:Concept rdf:about="EditorialFormatCodeCS.xml#2.1.2">
  <rdf:type rdf:resource="&owl;Thing"/>
  <skos:prefLabel xml:lang="en">Magazine</skos:prefLabel>
  <skos:broader rdf:resource="EditorialFormatCodeCS.xml#2.1"/>
  <skos:narrower rdf:resource="EditorialFormatCodeCS.xml#2.1.2.1"/>
  <skos:narrower rdf:resource="EditorialFormatCodeCS.xml#2.1.2.2"/>
</skos:Concept>
```

Gives...

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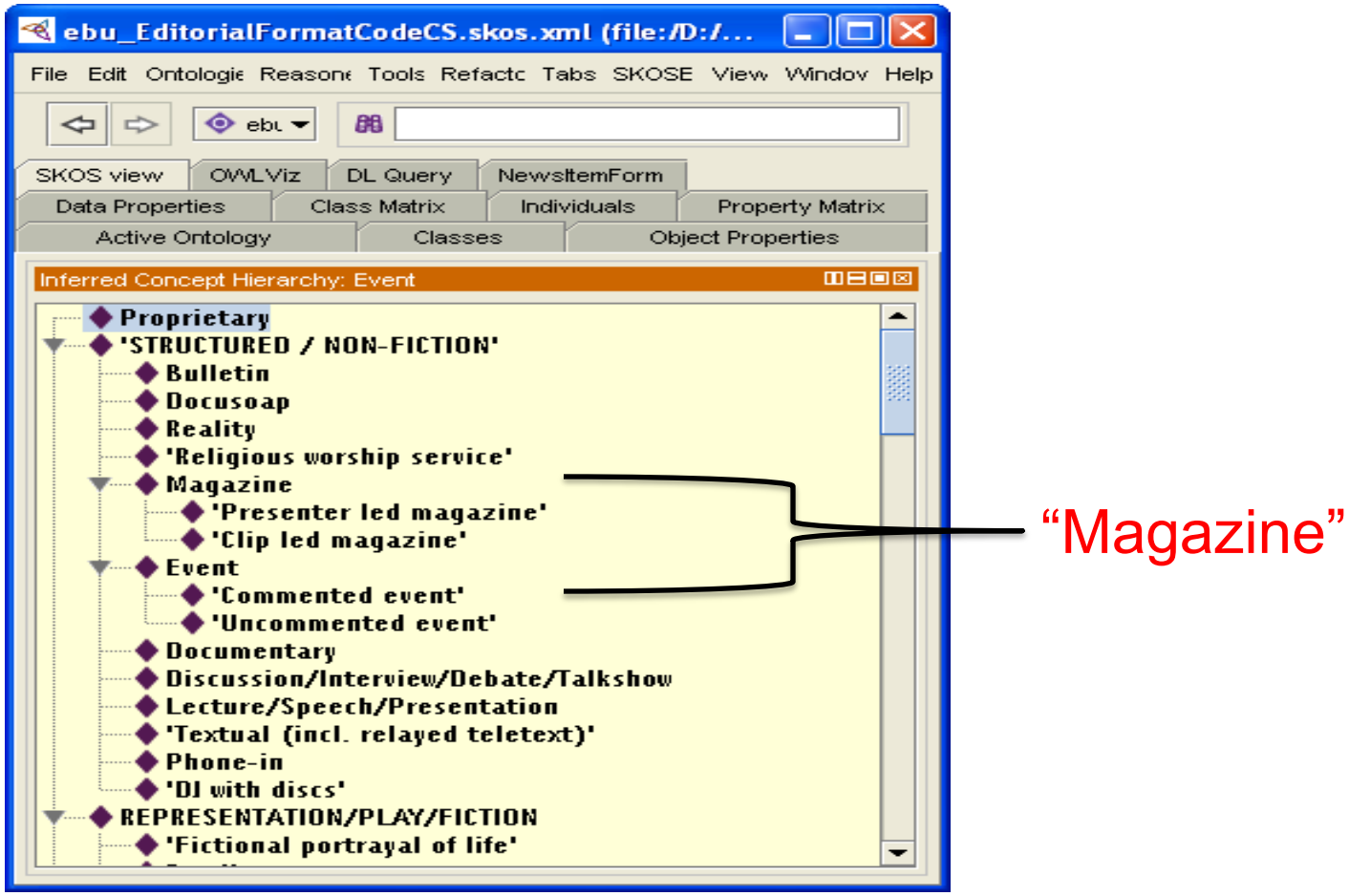
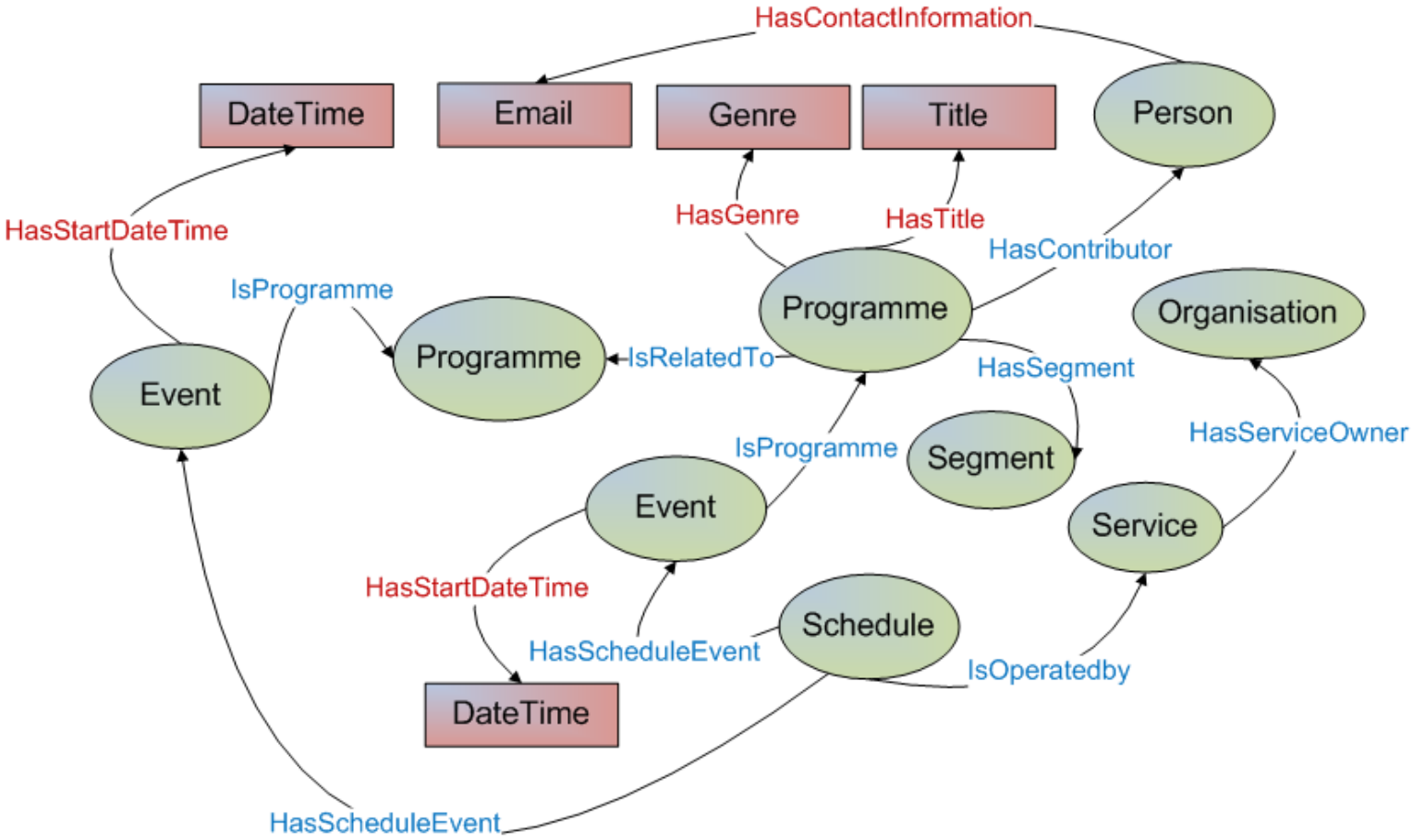



# SKOS Reasoning and Classification using Protégé (Stanford)

A series of RDF statements about each term and their respective position in the list allows a "reasoner" to re-construct the hierarchical classification

# Going further... The EPG example



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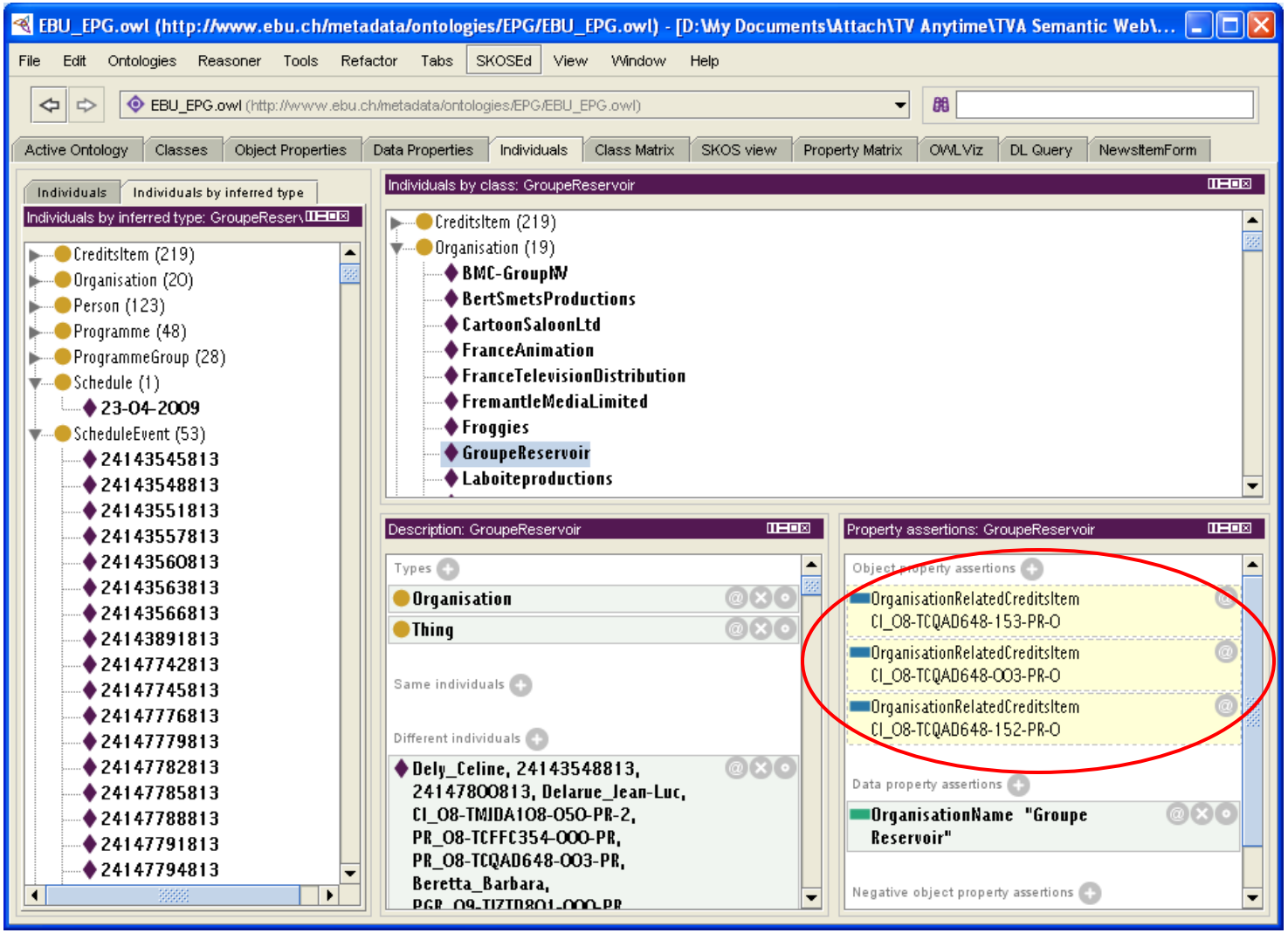


# Another insight into reasoning

Using Protégé, inverse properties allow a "reasoner " to infer new knowledge like credits involved in broadcast programmes and related to the organisation "Groupe Reservoir"

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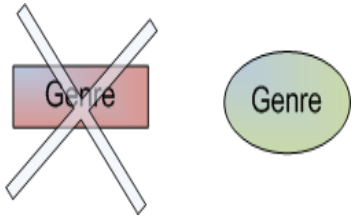
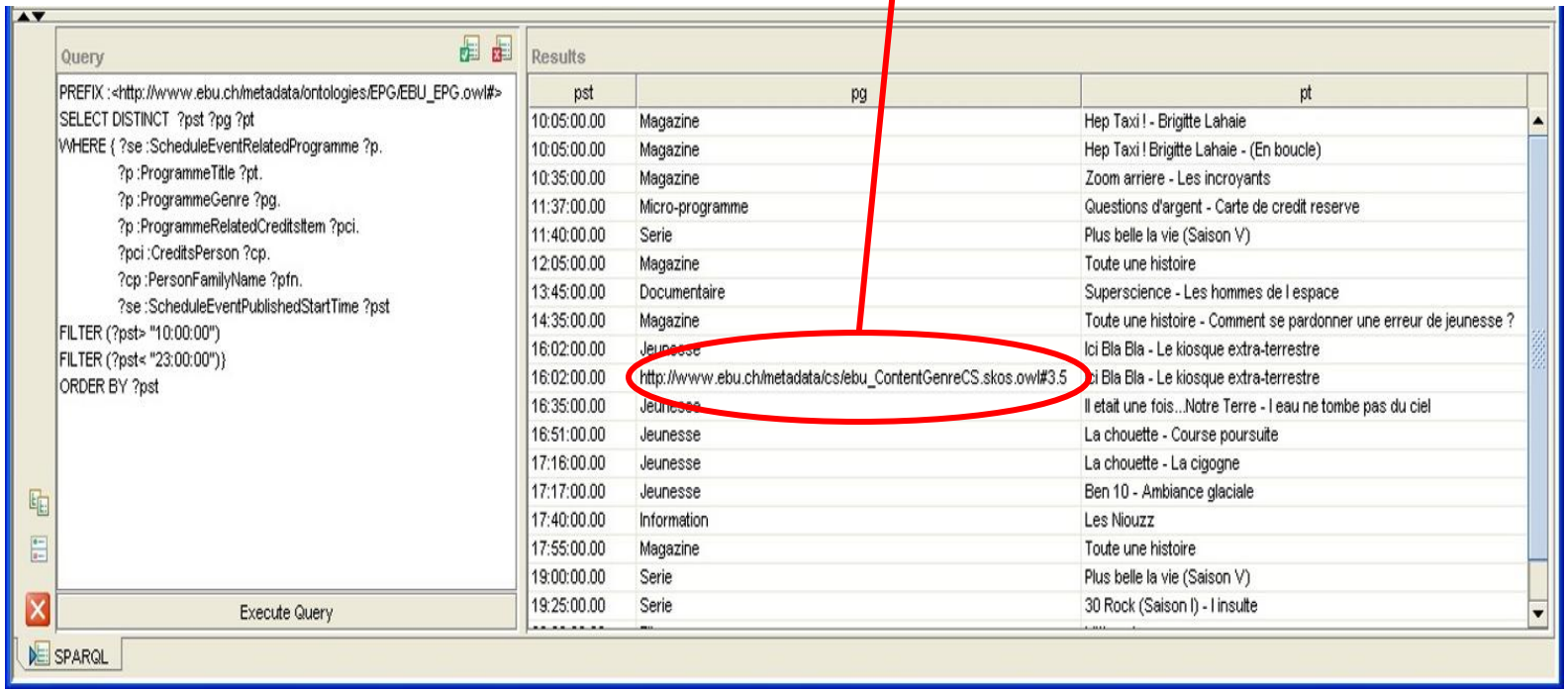






*Change "genre" to an object property and easily connect to a classification scheme as a new linked resource using URIs*




**Looking for all programmes within a particular time window?**
**Use SPARQL.**

*Schedule XML data used for RDF/OWL transform: courtesy RTBF*

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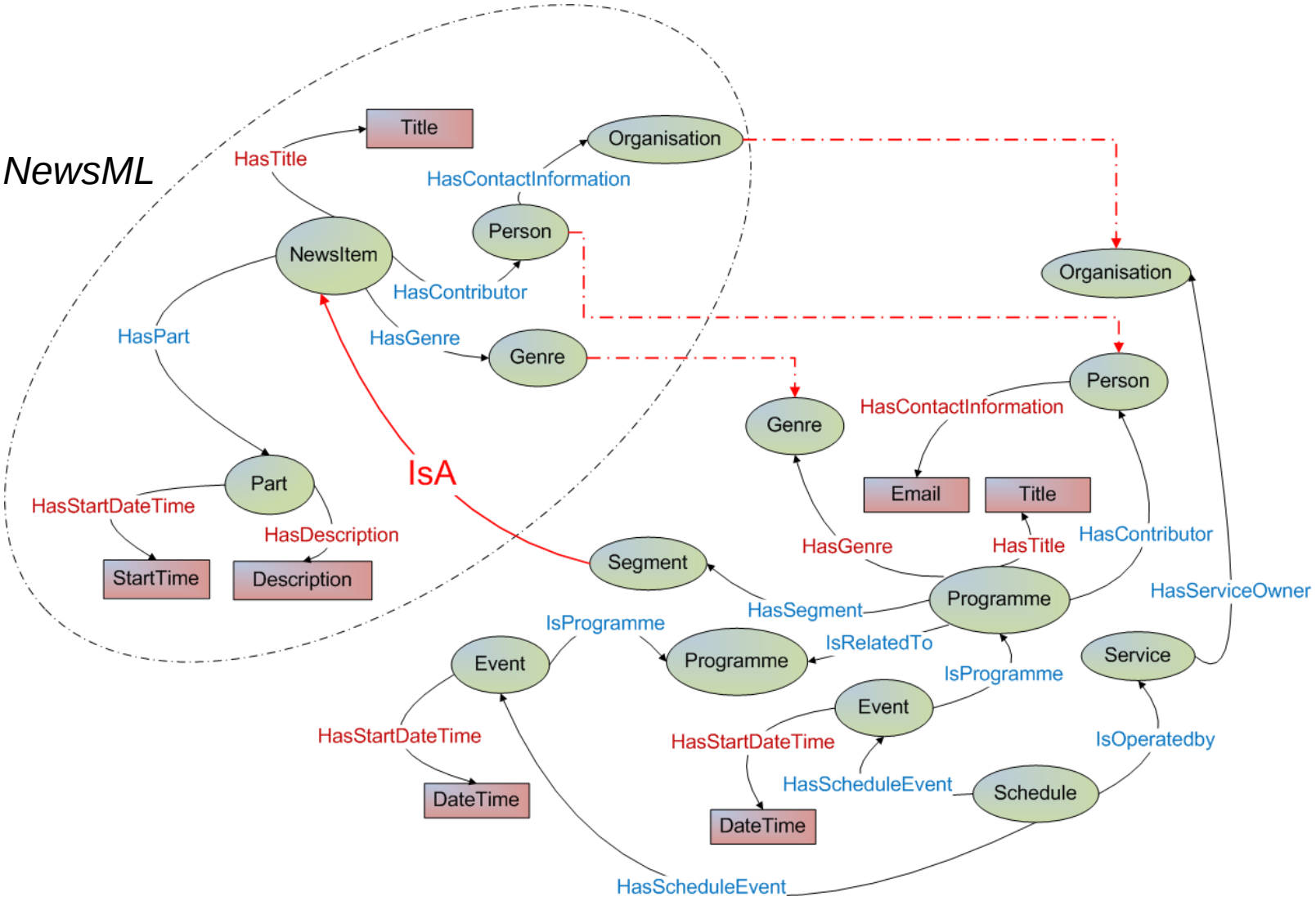
# Combining ontologies: a "segment" is a "news item"



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# In summary (1)

- Pros
  - Very intuitive and flexible
  - Modular
  - Easy multi-source collaborative metadata creation
    - Manage sensitive data
    - Allow external « tagging »
  - A good solution to link data and connect concepts
    - Bridging ontologies e.g. NewsML with the EPG
    - An elegant solution for classification schemes
  - Increasing search capabilites using existing resources
    - Metadata already exists

# In Summary (2)

- More work needed
  - Models need to be revisited
  - Tools are missing or incomplete and some basic datatypes (e.g. date & time) and are not fully supported
  - Versioning, updating needs more attention
  - More guidelines are necessary e.g. on where to store data to be harvested / crawled, identification (this is 'epg' like data), security, etc.
  - Search engines need further development
  - Ontologies and publication protocols need standardisation

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# CONCLUSION

# SEMANTIC WEB IS PART OF THE BROADCASTING FUTURE

# A direct access to users via Internet

Internet and search engines are starving for reliable focused information on programmes and services

This information is an asset of the content and service providers...

...who should develop portals or collaborate e.g. with search engines to guide users

SearchVoD | SearchTV

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For more information: evain@ebu.ch
http://tech.ebu.ch/semanticweb_ebu

# THANK-YOU!