

OMV

Ontology Metadata Vocabulary

April 10, 2008

Peter Haase

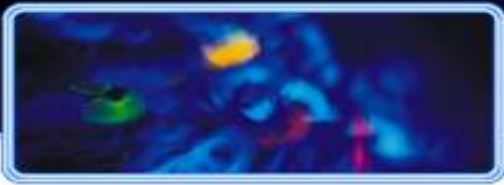
- **Finding and re-using** ontologies often difficult
 - Where can I find an ontology?
 - Who has developed a particular ontology?
 - For which domain / application?
 - ...
- **Metadata Standard** required to improve and ensure
 - Interoperability & exchange
 - Access & usability

- **OMV is ... a metadata schema**
 - Captures reuse-relevant information about an ontology
- **OMV consists of ... core and extensions**
 - OMV Core: fundamental information about an ontology and its life cycle
 - OMV Extensions: detailed account on specific phases of an ontology life cycle
- **OMV is designed ... as an ontology**
- **OMV is realized ... in OWL DL**



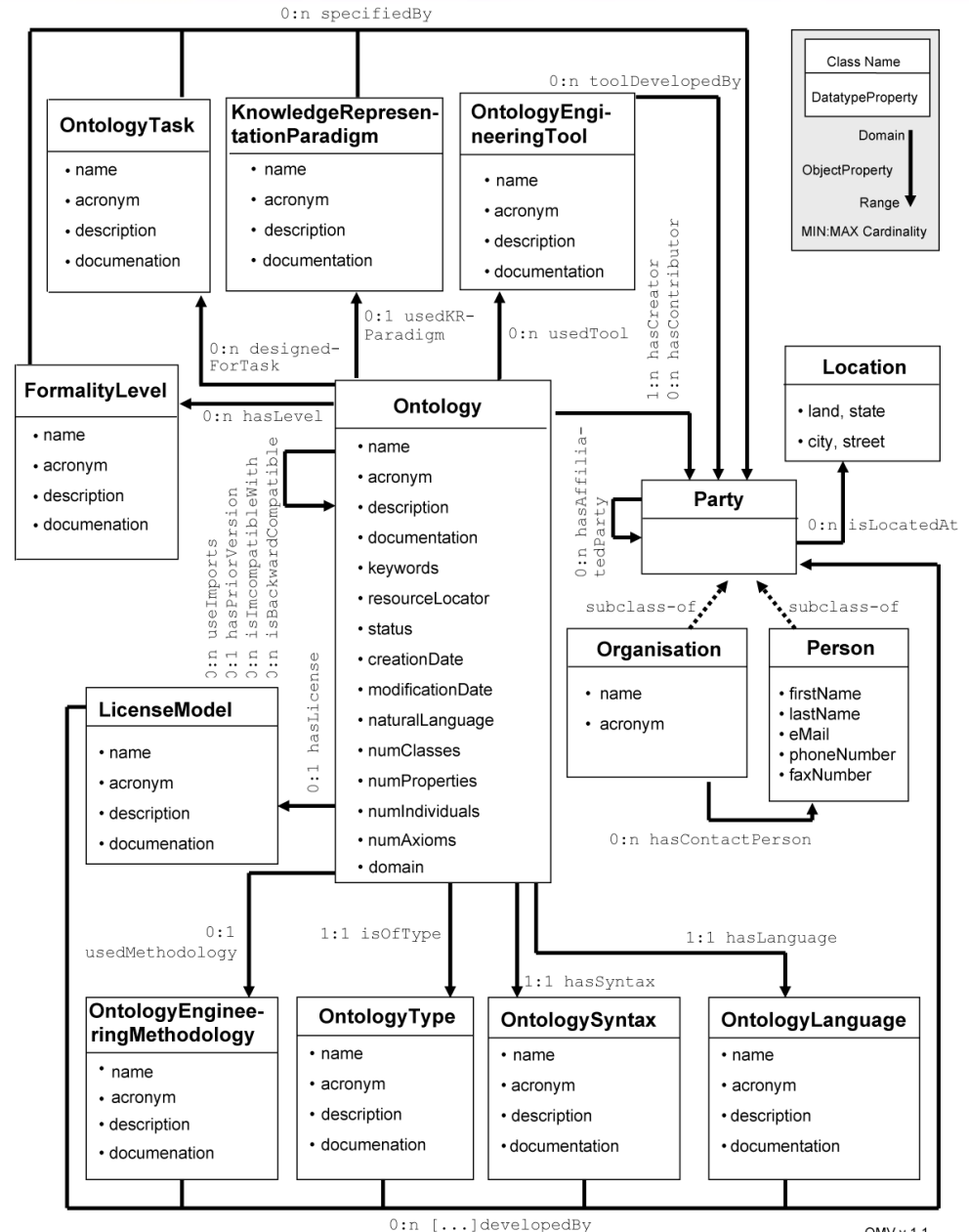
Metadata categories

- OMV organizes the metadata elements according to:
 - the type and purpose of the contained information as follows:
 - General
 - Availability
 - Applicability
 - Format
 - Provenance
 - Relationship
 - Statistics
 - the impact on the prospected reusability of the described ontological content as follows:
 - Required
 - Optional
 - Extensions



Further Classes:

- Party
 - Organisation
 - Person
- LicenseModel
- Knowledge Representation Formalism
- OntologyType
- OntologySyntax
- OntologyLanguage
- OntologyEngineeringTool
- ...

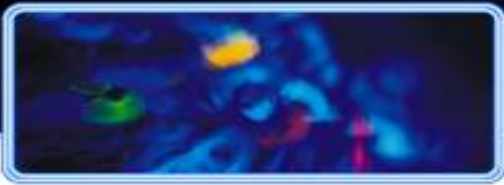


- **Current extensions**
 - Mappings between ontologies
 - Changes to ontologies (e.g. differences between versions)
 - Multilinguality
 - Peer metadata

- **Developers are free to create new domain specific extensions**

- Website <http://omv.ontoware.org/>
 - Download of the ontology
 - Technical Report
 - Additional information

- OMV Ontology hosted at Ontoware, a Source Code Management system for ontologies and ontology-based open source software



NeOn: An FP6 Integrated Project

- 14 diverse European partners from 6 EU countries

- corporations and SME-s



- not-for-profit, research



- ...and universities

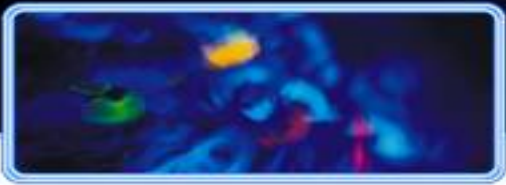


- € 14.7 mil project budget over 4 years to:

- create an open, service-oriented infrastructure for developing and managing dynamic, networked and contextualized ontologies
- support and sustain the community by means of an extensible NeOn Toolkit for engineering networked ontologies
- bootstrap a methodology and a set of guidelines enabling ordinary users to take advantage of the NeOn tools and NeOn infrastructure

- **Reuse as a prevailing strategy**
 - ability to bring in information from the semantic web
 - ability to support application development integrating multiple ontologies
 - ability to manage relationships between ontologies over time
 - **Collaboration at large scale**
 - support for distributed teams of ontology engineers and domain specialists
 - **Contextualized ontologies**
 - contextualization of modelling choices in terms of user groups, experiences, access rights, etc.
- *Comprehensive ontology metadata critical for all of the above!*

OMV Ontology in the NeOn Toolkit



OWL Editor - NeOn Toolkit

File Edit Navigate Search Project Run Text2Onto Window Help

Ontology Navigator

- Test2 [OWL]
- OMV [OWL]
 - http://omv.ontoware.org/2005/05/ontology
 - Classes
 - KnowledgeRepresentationParadigm
 - FormalityLevel
 - LicenseModel
 - OntologyEngineeringMethodology
 - Ontology
 - OntologySyntax
 - OntologyEngineeringTool
 - OntologyDomain
 - OntologyLanguage
 - Party
 - Location
 - OntologyType
 - OntologyTask
 - Object Properties
 - createsOntology
 - hasContactPerson
 - hasFormalityLevel
 - hasSyntax
 - specifies
 - contributesToOntology
 - isBackwardCompatibleWith
 - hasOntologySyntax
 - isSubDomainOf
 - isContactPerson
 - supportsRepresentationParadigm
 - defines
 - definedBy
 - hasOntologyLanguage
 - hasContributor

Entity Properties

Name:

Namespace:

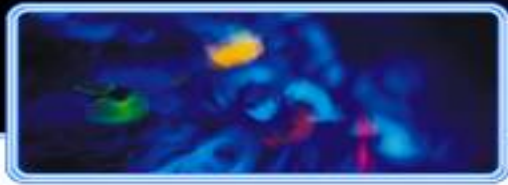
Restrictions on Properties

		Property	Range	Min	Max
INCL	ALL	hasOntologyLanguage	OntologyLanguage		
INCL	ALL	hasOntologySyntax	OntologySyntax		
INCL	AT_MOST	numberOfClasses	Literal		1
INCL	ALL	isOfType	OntologyType		
INCL	ALL	notes	string		

Descriptions

	Class Expression
INCL	Thing

Class Restrictions | Disjoint Classes | Annotations



Applications of OMV

- **Interoperability on (meta-)data level**
- **Interoperability on tool level**
 - Common interfaces to registry, repository
 - Proposal for OMV API existing
- **Example 1: Ontology Registries in NeOn**
 - Oyster as Open Source implementation
 - Centrasite as commercial product of Software AG
- **Example 2: Watson - Gateway to the Semantic Web**
 - Web interface for searching ontologies and semantic documents

OMV described using OMV in Oyster (eating its own dogfood ;-)

The screenshot shows the Oyster application window titled "Oyster - peter". The interface is divided into several sections:

- Scope:** Includes radio buttons for "Local Peer" (selected), "Automatic Search", and "Selected Peers", along with a "Change..." button.
- Search:** A search input field with "Search Now", "Stop Search", and "Clear" buttons.
- Search Details:** A series of input fields for "Ontology Name", "Ontology Type", "URL", "Language", "Status", "Ontology Language", "Ontology Syntax", "Keywords", "License", "Creator", "Contributor", and "Namespace".
- Navigation:** A tree view on the left showing a hierarchy: Top > Shopping > Computers > History > Directories > Shopping > Education > Ethics > Mailing_Lists > Companies > Organizations > Consultants > News_and_Media > News.
- Table:** A table listing ontologies with columns: Ontology Name, Acronym, Ontology La..., Language, and oyster:peer.

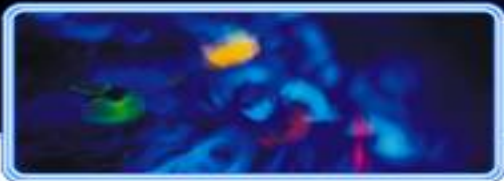
Ontology Name	Acronym	Ontology La...	Language	oyster:peer
Ontology Metadata Vocabulary	OMV	OWL DL	English	peter
Wine Ontology	Wine	OWL	English	peter
LexOMV		OWL		peter
- Ontology Metadata entry editor:** A modal dialog box titled "Ontology Metadata entry editor" with the subtitle "Edit Ontology Metadata entry". It contains a table of properties and values:

Property	Value
Ontology Name	Ontology Metadata Vocabulary
URL	http://omv.ontoware.org/2005/05/ontology
Acronym	OMV
Used in Applicati...	Oyster
Creator	Raul Palma and Peter Haase and Jens Hartmann
Version Info	2.3
Ontology Syntax	OWL/XML
Modification Date	September 2007
Domain	Directories and Computers
Keywords	ontology metadata
rdf:type	OntologyImplementation
Creation Date	May 2005
Ontology Language	OWL DL

Buttons for "Add", "Remove", "Edit", "Finish", and "Cancel" are present.
- Details:** An XML view of the ontology metadata:

```
<?xml version="1.0" encoding="utf-8"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:omv="http://omv.ontoware.org/2005/05/ontology">
  <rdf:Description rdf:about="http://omv.ontoware.org/2005/05/ontology"
  <rdf:type rdf:resource="http://omv.ontoware.org/2005/05/ontology" />
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource" />
  <omv:implementationName>Ontology Metadata Vocabulary</omv:implementationName>
  <omv:implementationAcronym>OMV</omv:implementationAcronym>
  <omv:naturalLanguage>English</omv:naturalLanguage>
  <omv:ontologyURL>http://omv.ontoware.org/2005/05/ontology</omv:ontologyURL>
  <omv:ontologyLanguage>OWL DL</omv:ontologyLanguage>
  <omv:ontologySyntax>OWL/XML</omv:ontologySyntax>
  <omv:versionInfo>2.3</omv:versionInfo>
  <omv:creationDate>May 2005</omv:creationDate>
  <omv:modificationDate>September 2007</omv:modificationDate>
  <omv:implementationKeywords>ontology metadata</omv:implementationKeywords>
  <omv:implementationDomain>Directories and Computers</omv:implementationDomain>
  <omv:implementationCreator>Raul Palma and Peter Haase and Jens Hartmann</omv:implementationCreator>
  <omv:usedInApplicationSystem>Oyster</omv:usedInApplicationSystem>
</rdf:Description>
```
- Buttons:** "Save", "Delete", "Copy All as RDF", and "Copy All as HTML" buttons are located at the bottom of the main window.

WATSON – Ontology Search



[Read this](#) - [Check your ontology](#) - [Website](#) - [Blog](#) - [Mailing List](#)

wine

[Search Watson](#)

Found 491 semantic documents - [Search Options](#)

- 1- <http://lists.w3.org/Archives/Public/www-webont-wg/2002Dec/att-0302/wine.owl> 
 - ◊ <http://kmi-web05.open.ac.uk:81/cache/3/0a7/8c42/b4ed6/4d9913823a/ef05dbef2bc08e8d3#Wine> 
 - ◊ <http://www.example.org/wine.owl> 
- 2- <http://edge.cs.drexel.edu/assemblies/tests/owljesskb/2k3/09/wine-short.owl> 
 - ◊ <http://www.w3.org/2002/03owl/miscellaneous/consistent001#Wine> 
- 3- <http://www-agentcities.doc.ic.ac.uk/ontology/restaurant.daml> 
 - ◊ <http://kmi-web05.open.ac.uk:81/cache/3/e42/3ae7/f430d/ed73ba7b3b/5832fa536992982b3#Wine> 
 - ◊ <http://kmi-web05.open.ac.uk:81/cache/3/e42/3ae7/f430d/ed73ba7b3b/5832fa536992982b3#region> 
 - ◊ <http://kmi-web05.open.ac.uk:81/cache/3/e42/3ae7/f430d/ed73ba7b3b/5832fa536992982b3#priceByGlass> 
 - ◊ <http://kmi-web05.open.ac.uk:81/cache/3/e42/3ae7/f430d/ed73ba7b3b/5832fa536992982b3#wineType> 
- 4- <http://www.csd.abdn.ac.uk/research/AgentCities/ontologies/restaurant-v4> 
 - ◊ <http://www.csd.abdn.ac.uk/research/AgentCities/ontologies/restaurant-v4#Wine> 
 - ◊ <http://www.csd.abdn.ac.uk/research/AgentCities/ontologies/restaurant-v4#region> 
 - ◊ <http://www.csd.abdn.ac.uk/research/AgentCities/ontologies/restaurant-v4#priceByGlass> 
 - ◊ <http://www.csd.abdn.ac.uk/research/AgentCities/ontologies/restaurant-v4#wineType> 
- 5- <http://www.ling.helsinki.fi/kit/2004k/ct310semw/OWL/wine.daml.rdf> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#WINE> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#ICE-WINE> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#RED-WINE> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#WINE-COLOR> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#WINE-BODY> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#TABLE-WINE> 
 - ◊ <http://potato.cs.man.ac.uk/ontologies/booze#WINE-REGION> 

WATSON – Result Details



Details for <http://www.example.org/wine.owl>

[Back](#)

[Get cached file](#) - [Query with SPARQL](#) - [Get OMV](#)

<i>Size of the file</i>	77 KB
<i>Number of statements</i>	1873
<i>Representation languages</i>	RDF,OWL
<i>Employed DL</i>	SHOIN
<i>Number of classes</i>	74
<i>Number of properties</i>	13
<i>Number of individuals</i>	162
 <i>User Reviews</i>	Not reviewed yet :-(Review with Revyu.com
<i>Locations</i>	http://www.w3.org/TR/2003/WD-owl-guide-20030210/wine.owl http://mirrors.webthing.com/view=Medium/www.w3.org/TR/2003/WD-owl-guide-20030210/wine.owl
<i>Imports</i>	http://www.example.org/food.owl
<i>Imported By</i>	

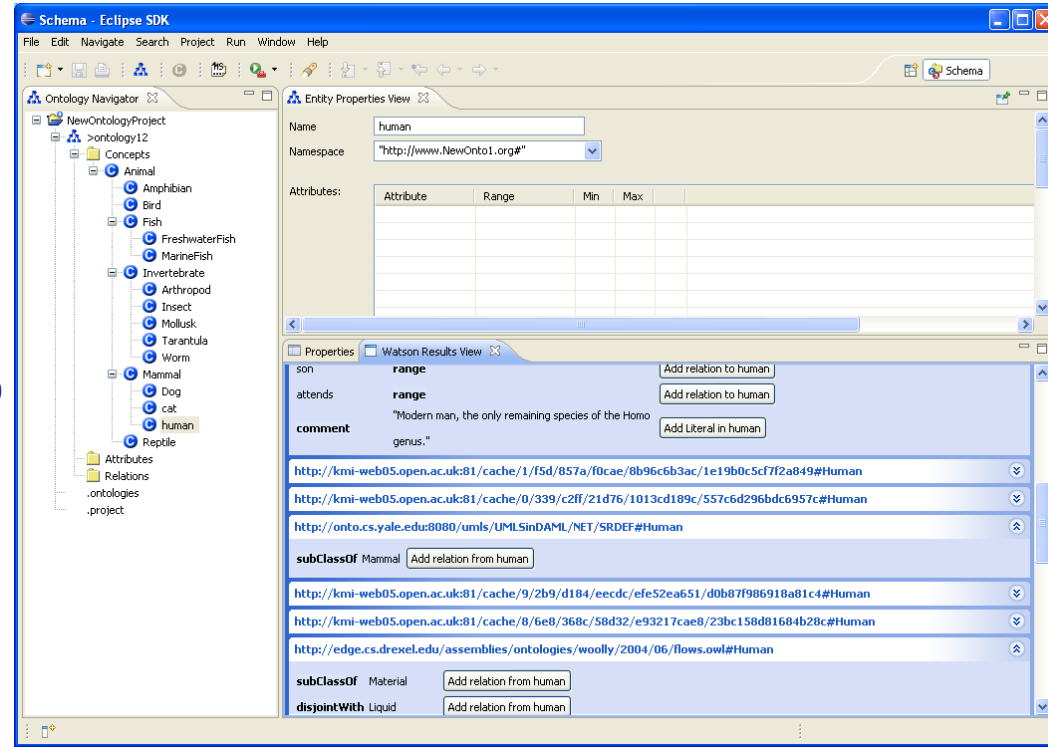


WATSON – Results in OMV

```
- <rdf:RDF xml:base="http://omv.ontoware.org/2005/05/ontology#">
  <owl:Ontology rdf:about="#"/>
  - <a:OntologyLanguage rdf:ID="OWL">
    - <a:description rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
      - This ontology contains instantiation of either OWL:Class or OWL:Property or both
    </a:description>
    <a:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">OWL</a:name>
  </a:OntologyLanguage>
  - <a:Ontology rdf:about="http://www.example.org/food.owl?location=http://www.example.org/food.owl">
    <a:URI rdf:datatype="http://www.w3.org/2001/XMLSchema#string">http://www.example.org/food.owl</a:URI>
    <a:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">http://www.example.org/wine.owl</a:name>
    <a:resourceLocator rdf:datatype="http://www.w3.org/2001/XMLSchema#string">http://www.example.org/food.owl</a:resourceLocator>
  </a:Ontology>
  - <a:Ontology rdf:about="http://www.example.org/wine.owl?location=http://www.w3.org/TR/2003/WD-owl-guide-20030210/wine.owl">
    <a:URI rdf:datatype="http://www.w3.org/2001/XMLSchema#string">http://www.example.org/wine.owl</a:URI>
    <a:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">http://www.example.org/wine.owl</a:name>
    <a:numberOfAxioms rdf:datatype="http://www.w3.org/2001/XMLSchema#unsignedInt">1873</a:numberOfAxioms>
    <a:numberOfClasses rdf:datatype="http://www.w3.org/2001/XMLSchema#unsignedInt">74</a:numberOfClasses>
    <a:numberOfIndividuals rdf:datatype="http://www.w3.org/2001/XMLSchema#unsignedInt">162</a:numberOfIndividuals>
    <a:numberOfProperties rdf:datatype="http://www.w3.org/2001/XMLSchema#unsignedInt">13</a:numberOfProperties>
  - <a:resourceLocator rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
    http://www.w3.org/TR/2003/WD-owl-guide-20030210/wine.owl
  </a:resourceLocator>
  <a:hasOntologyLanguage rdf:resource="#OWL"/>
  <a:useImports rdf:resource="http://www.example.org/food.owl?location=http://www.example.org/food.owl"/>
</a:Ontology>
<owl:Class rdf:ID="Ontology"/>
```

Watson NeOn Toolkit plugin

- While building an ontology with the Neon toolkit
- Find descriptions of existing entities in Web ontologies
- Integrate these descriptions into the edited ontology
- Thus allowing knowledge reuse at the scale of the Semantic Web
- In one simple, integrated, and interactive tool





OMV Consortium

- History:

- Originally, OMV was developed within the Knowledge Web project by UPM, AIFB, TU Berlin
- OMV consortium was founded to sustain developments of OMV
- At the moment, OMV is mainly further developed in the NeOn project and by Stanford BMIR

- Several organizations have expressed interest in using and contributing to OMV

- Stanford BMIR intend to use OMV in Protege and their Bioportal ontology repository
- OMG to use it in their ontology repository

- Thus far, the OMV consortium is not a real legal entity

- Different alternative models for standardization being discussed:

- De-facto standard via support by Protege and NeOn
- Standardization within STI2 or NeOn Foundation
- OMG PSIG



Summary

- OMV as a vocabulary to represent metadata about ontologies
- Several applications using OMV already available
- Development by OMV Consortium
 - Open for everyone to join and contribute
 - Standardization model still being discussed