



Ontology development

María Poveda Villalón
Ontology Engineering Group
Universidad Politécnica de Madrid, Spain

✉ mpoveda@fi.upm.es

🐦 [@MariaPovedaV](https://twitter.com/MariaPovedaV)

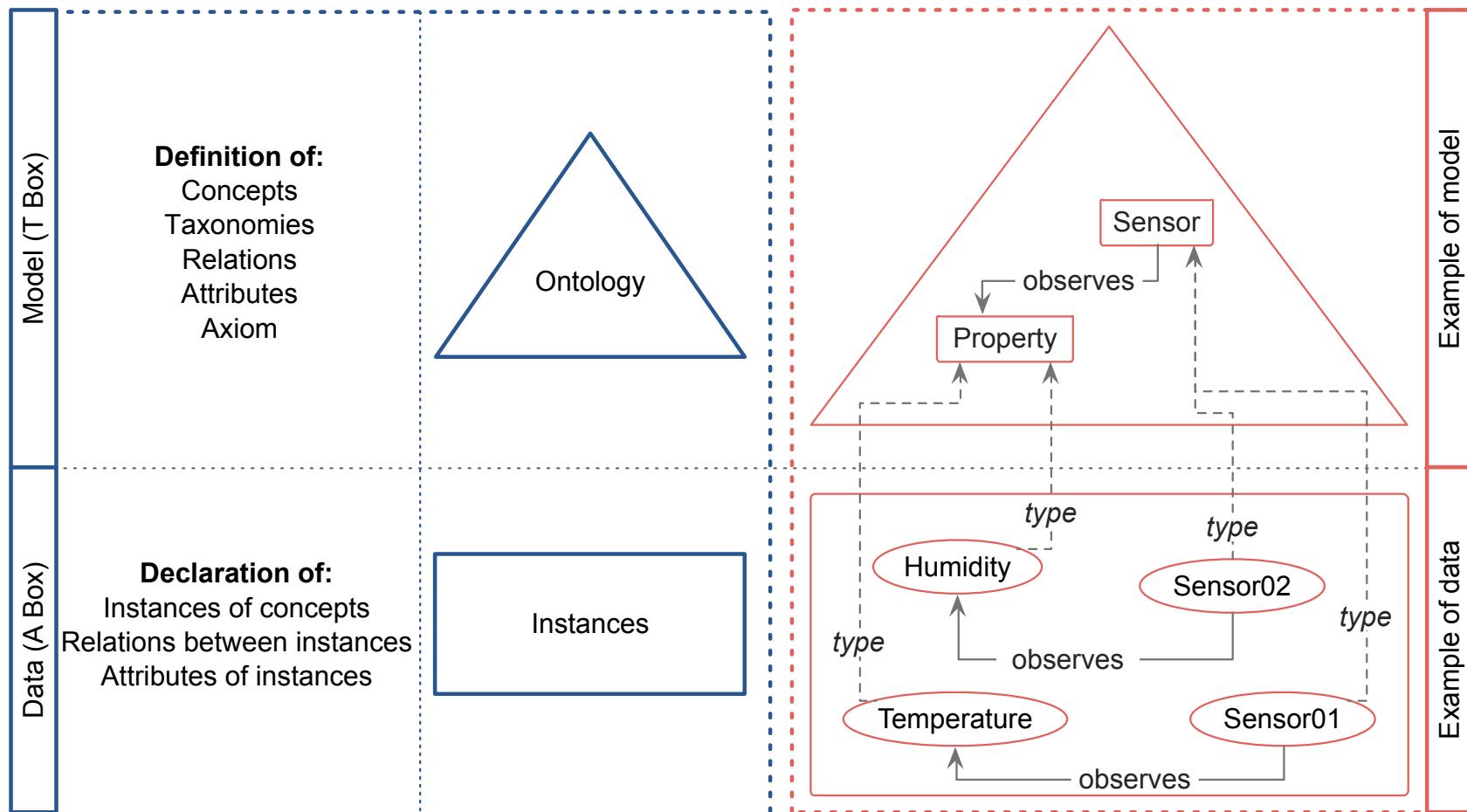
📅 17th June 2019

📍 Lisbon-LDAC Summer School

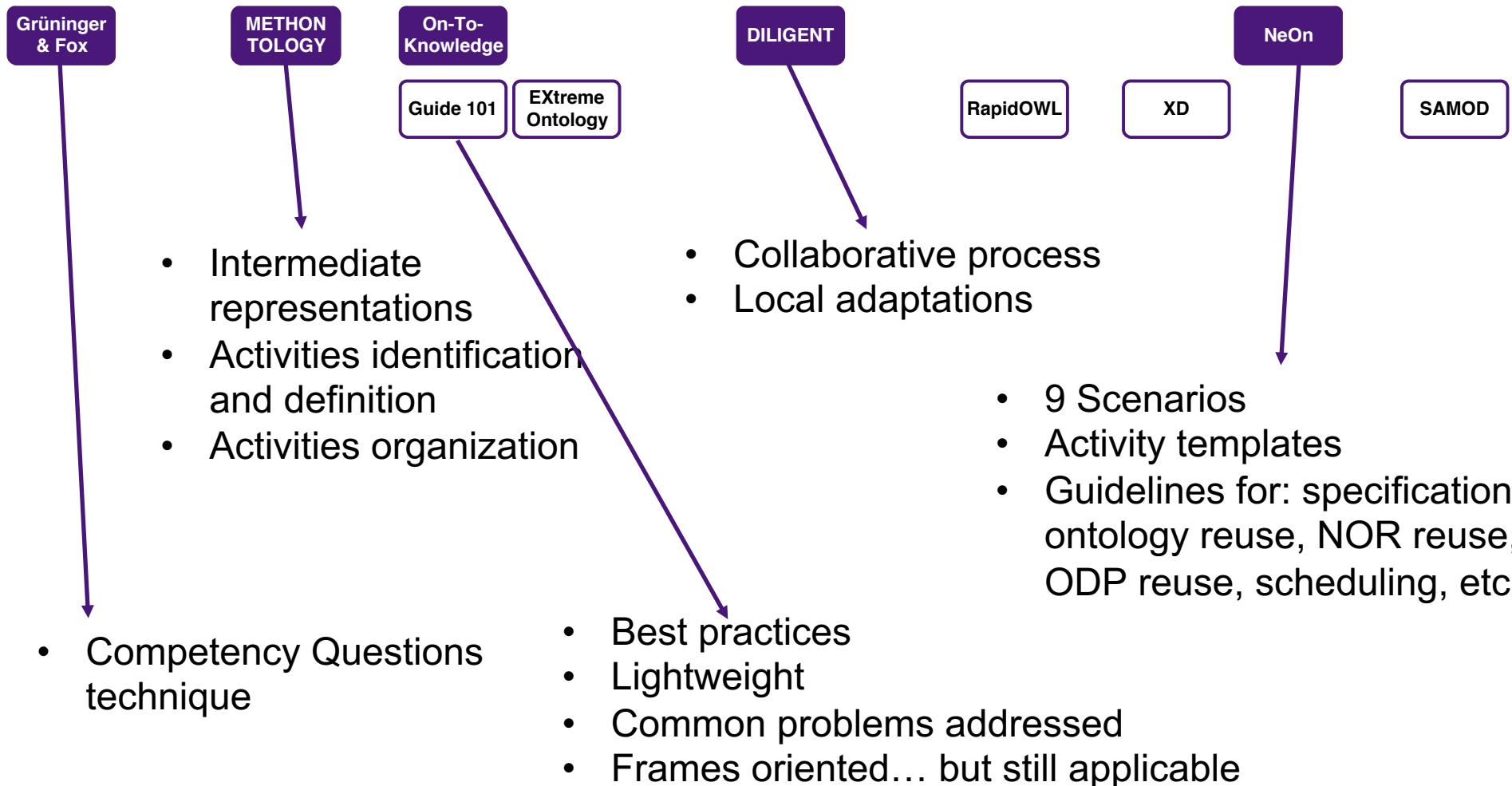


Vocabularies define the **concepts** and **relationships** used to **describe** and represent an area of concern.

Definition taken from: <http://www.w3.org/standards/semanticweb/ontology>



Some Ontology Development Methodologies



Ontology Development Methodologies



Grüninger
& Fox

METHON
TOLOGY

On-To-
Knowledge

DILIGENT

NeOn

Guide 101

EXtreme
Ontology

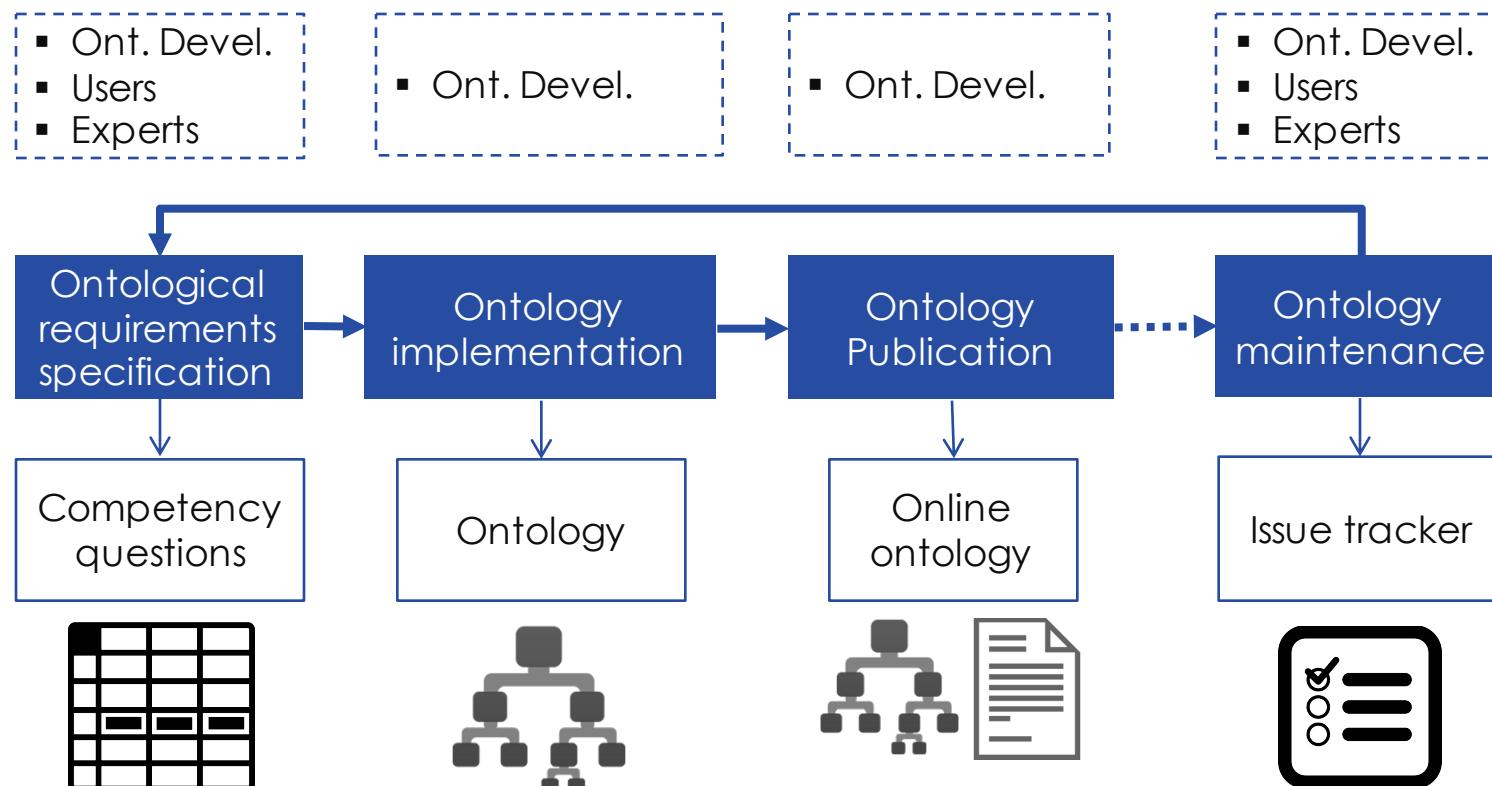
RapidOWL

XD

SAMOD

- Towards lightweight and agile processes
- Inspiration from software development practices
- Coupling Software and ontology development

Ontology development process overview



Legend

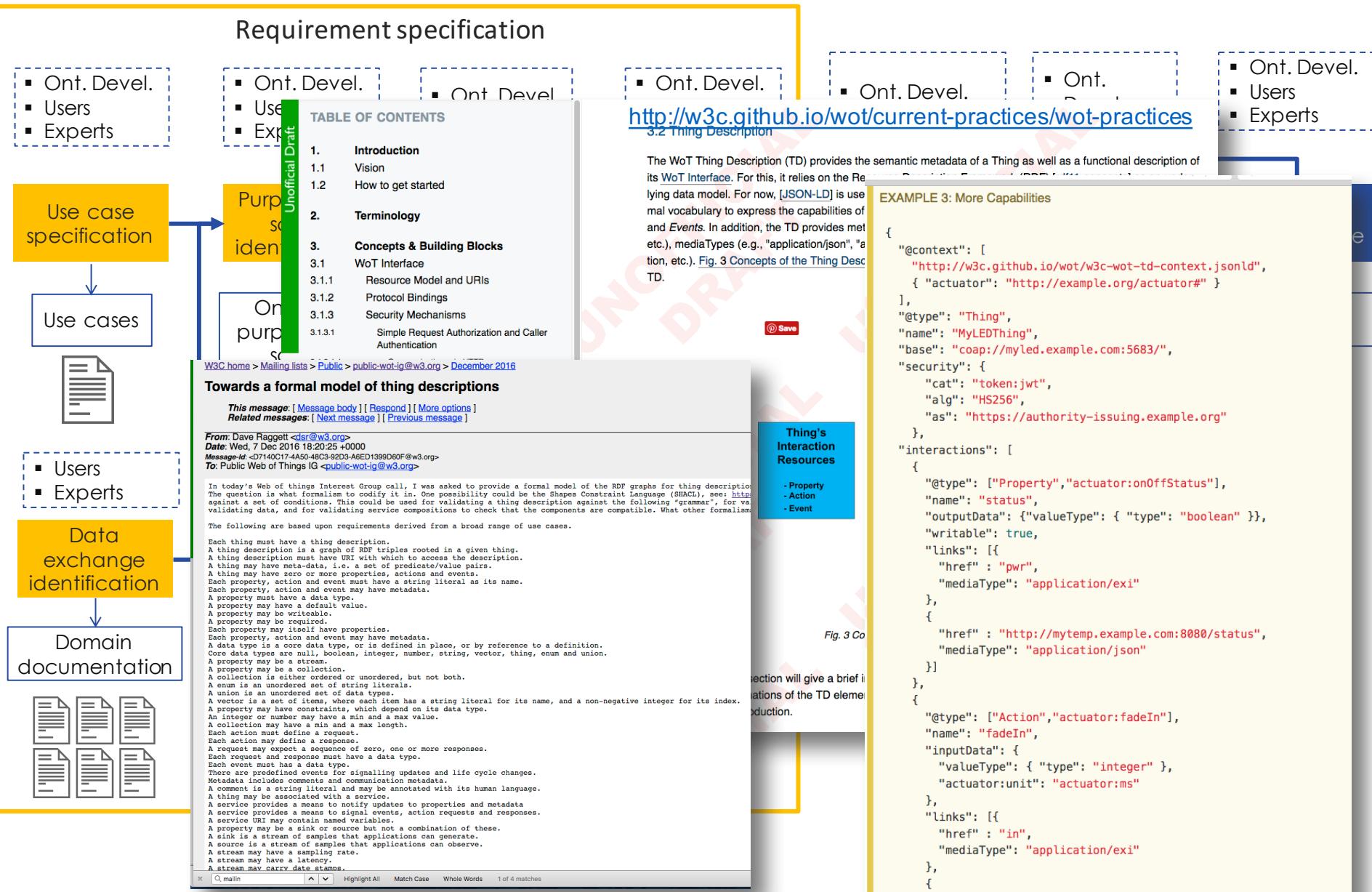
▪ Actor

Activity

Output

activity flow

Requirement specification



<https://lists.w3.org/Archives/Public/public-wot-ig/2016Dec/0016.html>

Requirement specification



	A	B	C	D	E	F	G	H	I
	Requirement								
	Identifier (domain+id)	Responsible partner	Sprint	Competency Question / Natural language sentence (fact)	Answer	Status (Proposed, Accepted, Rejected, Deprecated)	Superseded by	Comments	Extracted from (provenance)
76	platform73			What is a system integrator?	R			Is this needed?	D1.5 - Use Case 4 UC0400
77	platform74			What is a hardware platform?	R			Is this needed?	D1.5 - Use Case 4 UC0400
78	platform75	-		What is an audit trail?	R			Repeated	D1.5 - Use Case 4 UC0400
79	platform76			What is a IoT operator account?	R			Is this needed?	D1.5 - Use Case 4 UC0400
80	platform77			What is an added value service agent?	R			Is this needed?	D1.5 - Use Case 4 UC0400
81	platform78			What is an IoT platform agent?	R			Is this needed?	D1.5 - Use Case 4 UC0400
82	platform79		2	What is an IoT device agent?	R			Is this needed?	D1.5 - Use Case 4 UC0400
83	platform80	BVN	2	Which devices are there?	A				25-01-2016 meeting minutes
84	platform81	BVN	2	What are the devices of a given agent or organization?	A				25-01-2016 meeting minutes
85	platform82	BVN	2	Which devices can I see?	A				25-01-2016 meeting minutes
86	platform83	BVN	2	Which services can I see?	A				25-01-2016 meeting minutes
87	platform84	BVN	2	Which devices are located at a CERTH lab?	D	platform158			25-01-2016 meeting minutes
88	platform85	BVN	2	What are the devices of a specific partner?	A				25-01-2016 meeting minutes
89	platform86	BVN	2	What are the services of a specific partner?	A				25-01-2016 meeting minutes
90	platform87	BVN	2	Which is the profile of a given device?	A				25-01-2016 meeting minutes
91	platform88	BVN	2	A device profile indicates the device name	A				25-01-2016 meeting minutes
92	platform89	BVN	2	A device profile indicates the device avatar	A				25-01-2016 meeting minutes
93	platform90	BVN	4	A device profile indicates the type of device, e.g. sensor or actuator	A				25-01-2016 meeting minutes
94	platform91	BVN	2	A device profile indicates the device vendor	A			The device vendor and producer are the same	25-01-2016 meeting minutes
95	platform92	BVN	2	A device profile indicates the device serial number	A				25-01-2016 meeting minutes
96	platform93	-		A device profile indicates the device producer	R				25-01-2016 meeting minutes
97	platform94	BVN	2	A device profile indicates the device owner	A				25-01-2016 meeting minutes
98	platform95	BVN	2	A service profile indicates the service name	A				25-01-2016 meeting minutes
99	platform96	BVN	2	A service profile indicates the service avatar	A				25-01-2016 meeting minutes
100	platform97	BVN	2	A service profile indicates the service owner	A				25-01-2016 meeting minutes
101	platform98	BVN	2	A service profile indicates the service provider	A				25-01-2016 meeting minutes

Domain documentation



▪ Ont. Devel.

▪ Ont. Devel.

▪ Ont.
Devel.

- Ont. Devel.
- Users
- Experts

Ontology implementation

Ontology Publication

Ontology maintenance

Ontology

Online ontology

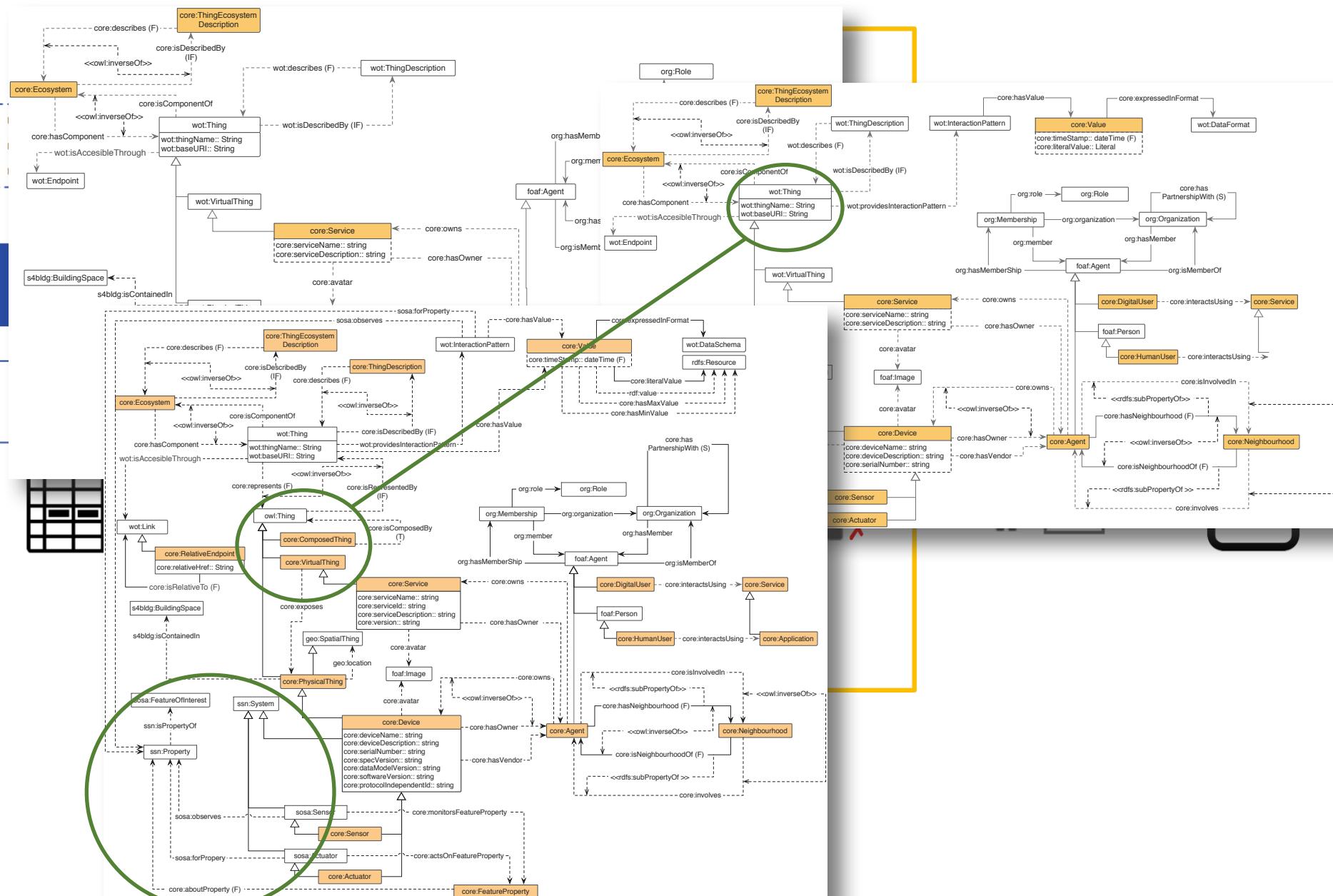


Shared in
online
spreadsheets

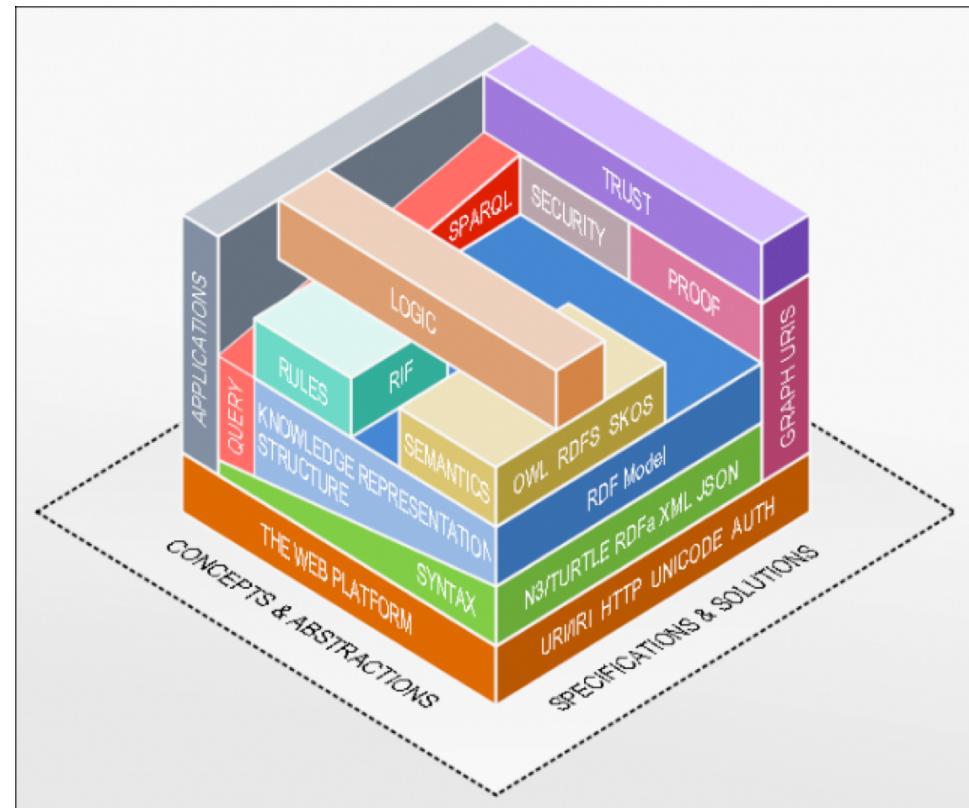
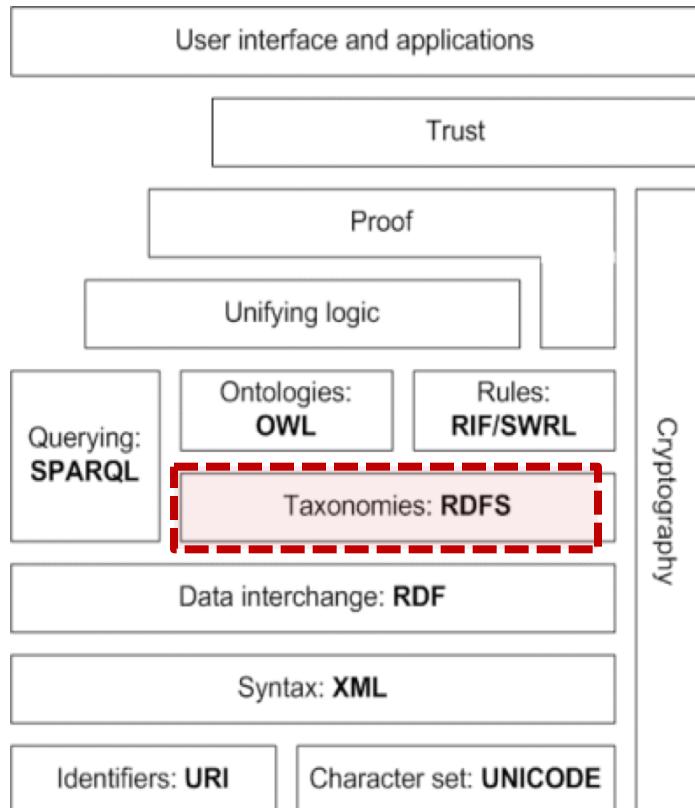
snapshot in
documentation

Automation:
Work in progress

Implementation - Conceptualization

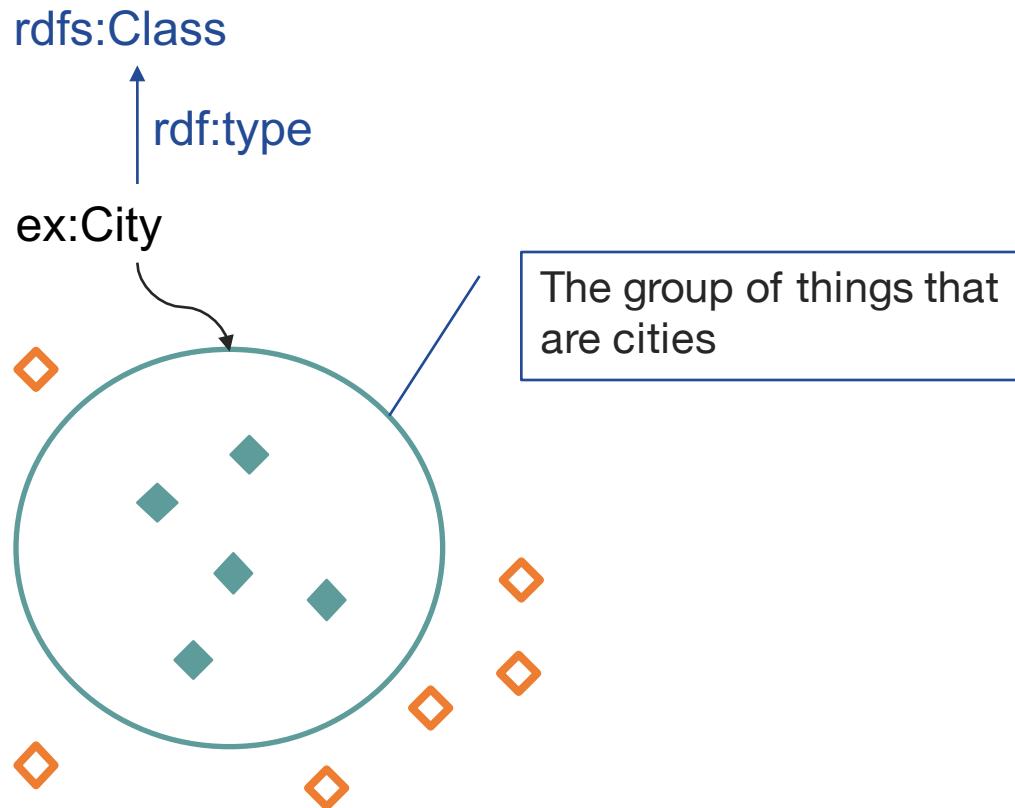


Ontology Implementation Languages



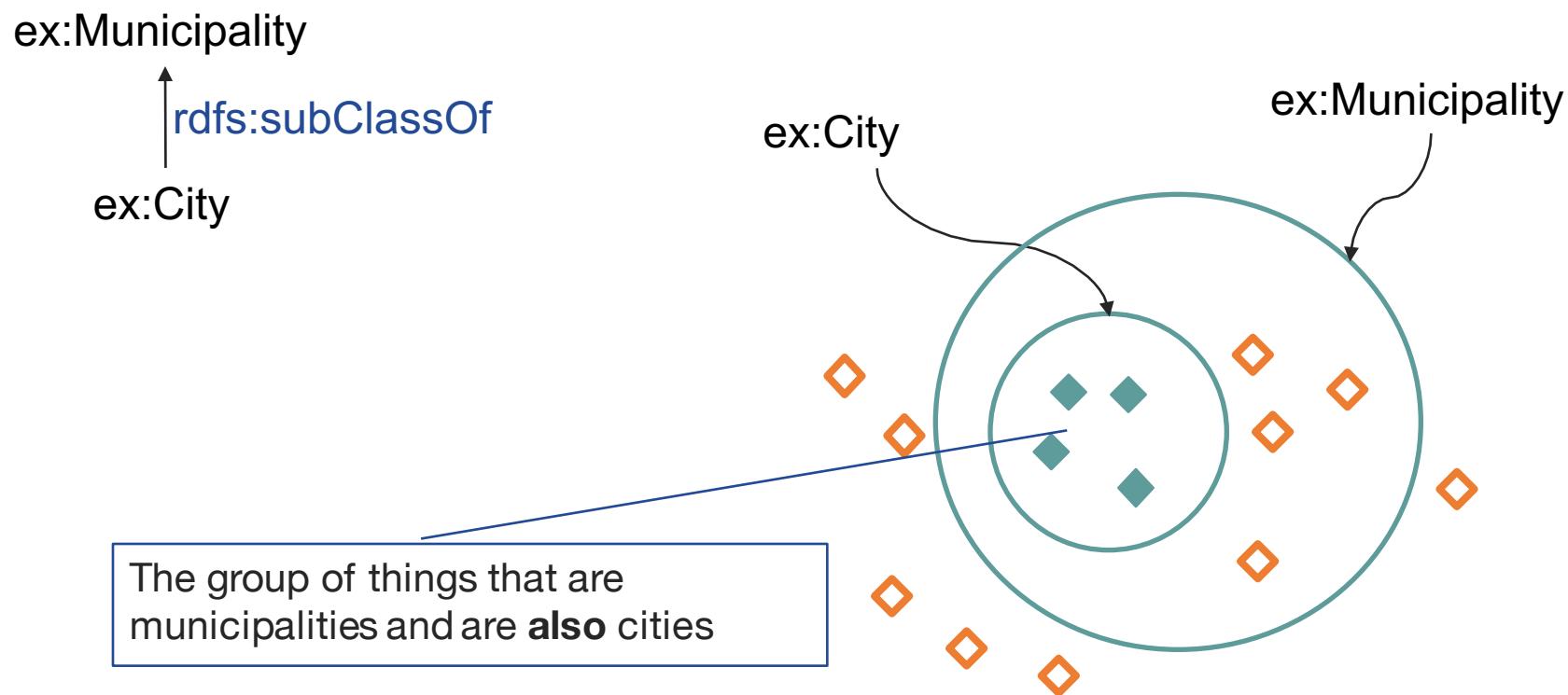
- **rdfs:Class**

- Concepts of the domain (generally)
- **Classes with name:**
 - URI as identifier



- **rdfs:subClassOf**

- The individuals belonging to a class also belong to the parent classes in the hierarchy

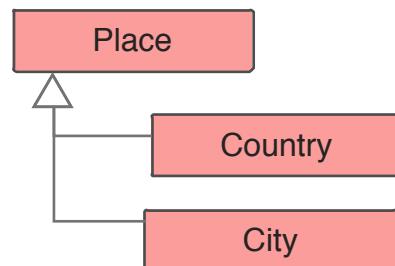




Define the classes and hierarchies in your domain

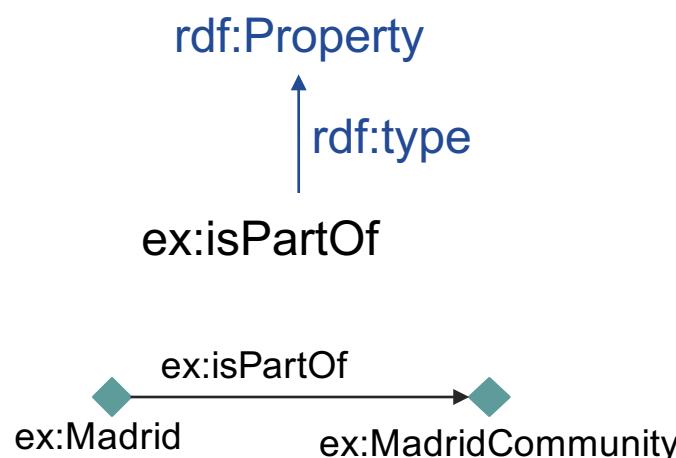
Look at your Ontology Requirements

Generate the diagram of classes and hierarchies

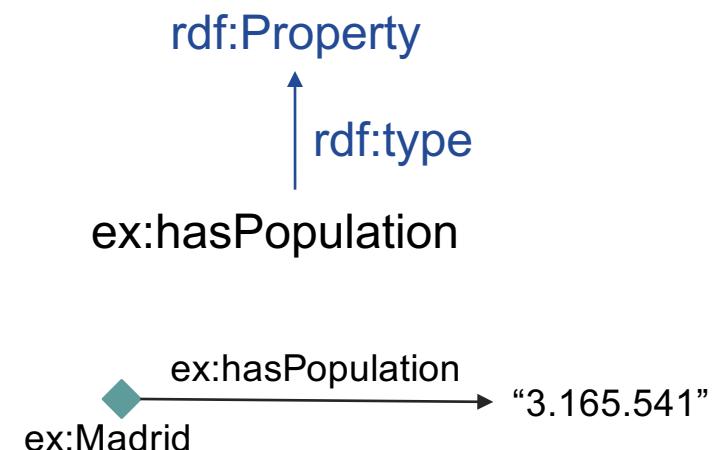


■ **rdf:Property**

- Relation between individuals
- Relación between an individual and a value



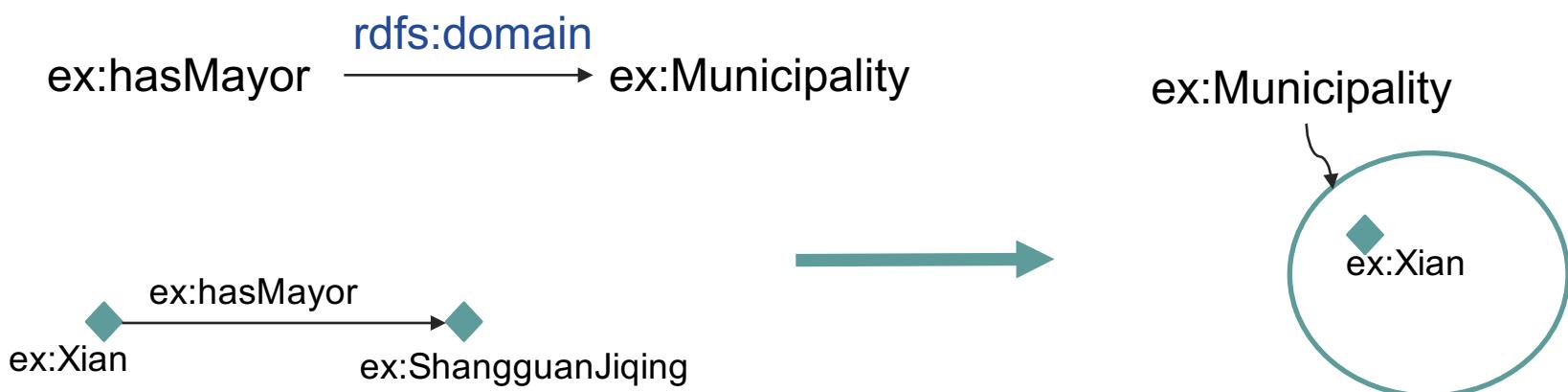
Example of relation
between individuals



Example of relation
between one individual
and a value

- **rdfs:domain**

- All individuals that appear as **subject** in a triple with the given property **belongs to the class** defined as **domain** of the property
- It is valid for relations and attributes



- **rdfs:range**

- All individuals that appear as **object** in a triple with the given property **belongs to the class** defined as **range** of the property
- It is valid for classes (applies to relations) or datatypes (applies to attributes)

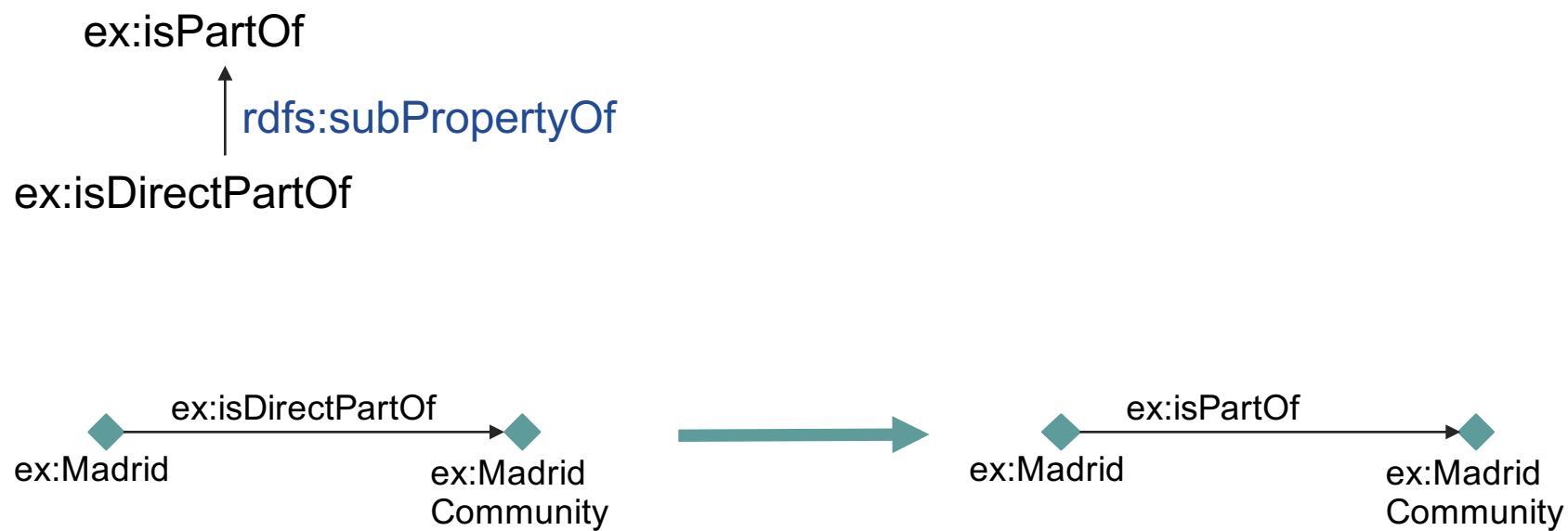




RDF(S) Elements. *Properties. subPropertyOf*

■ **rdfs:subPropertyOf**

- When there is a property between two elements (two individuals or an individual and a value), the parent property in the hierarchy is also true for the pair of elements
- Applicable to *object properties (relations)* and *datatype properties (attributes)*.





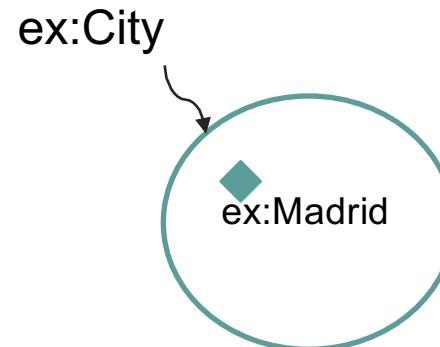
Update your model including properties

Look at your Ontology Requirements

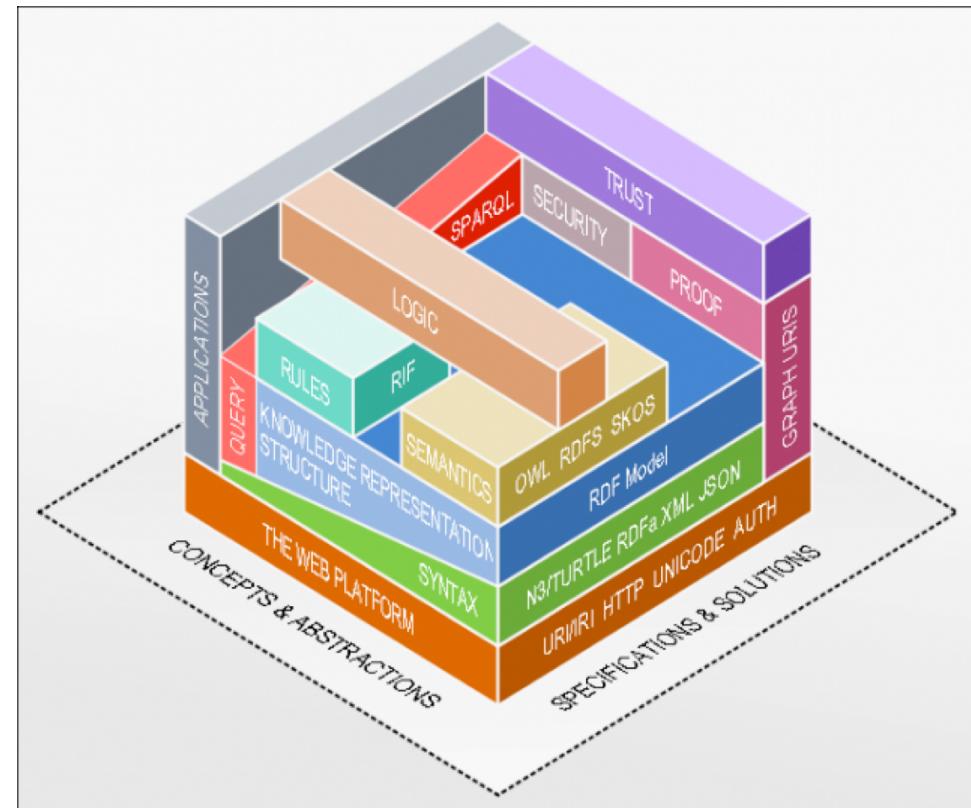
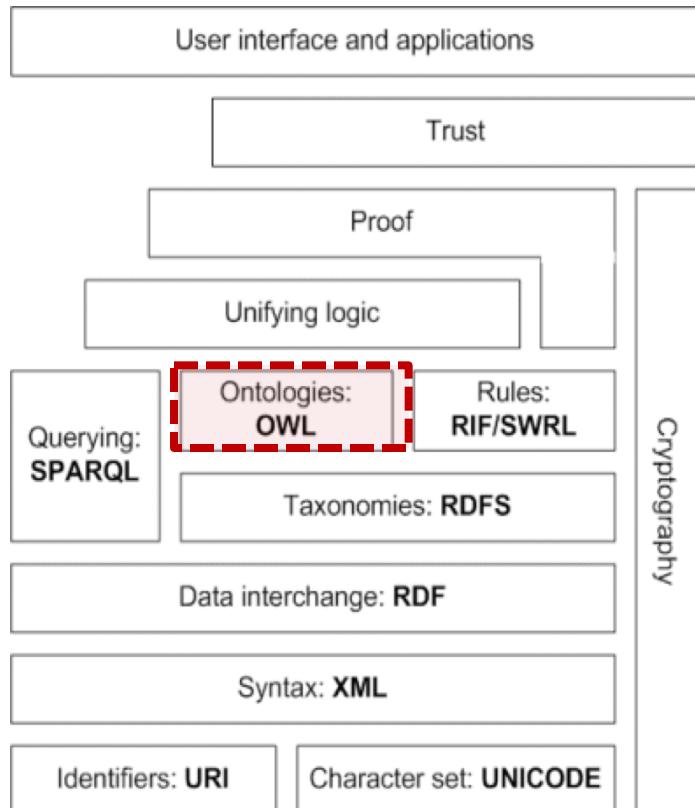


- **rdf:typeOf**

- Indicate the class or classes of an individual (instance)



Ontology Implementation Languages

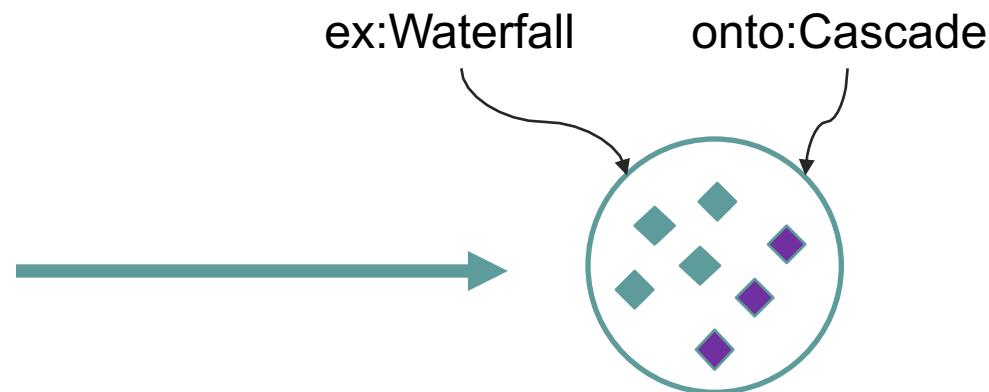
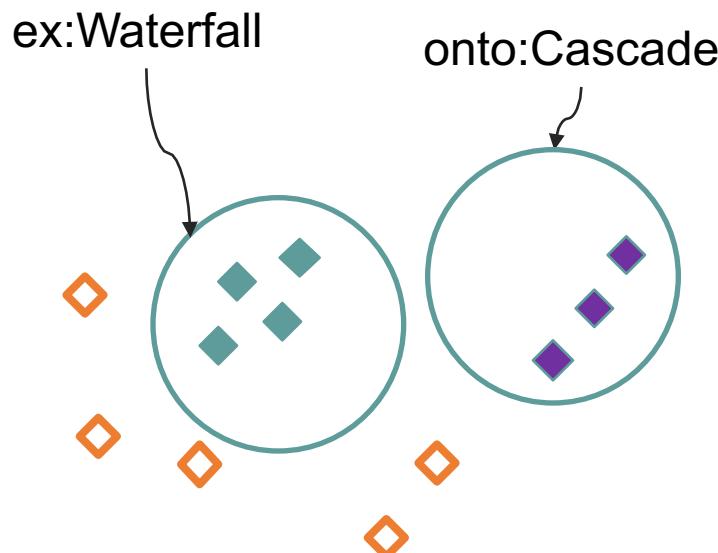


- OWL
 - **Classes**
 - Axioms
 - Properties
 - Characteristics
 - Individuals

- **owl:equivalentClass**

- The two classes contain exactly the same individuals
- If an individual belongs to a class it also belongs to the other

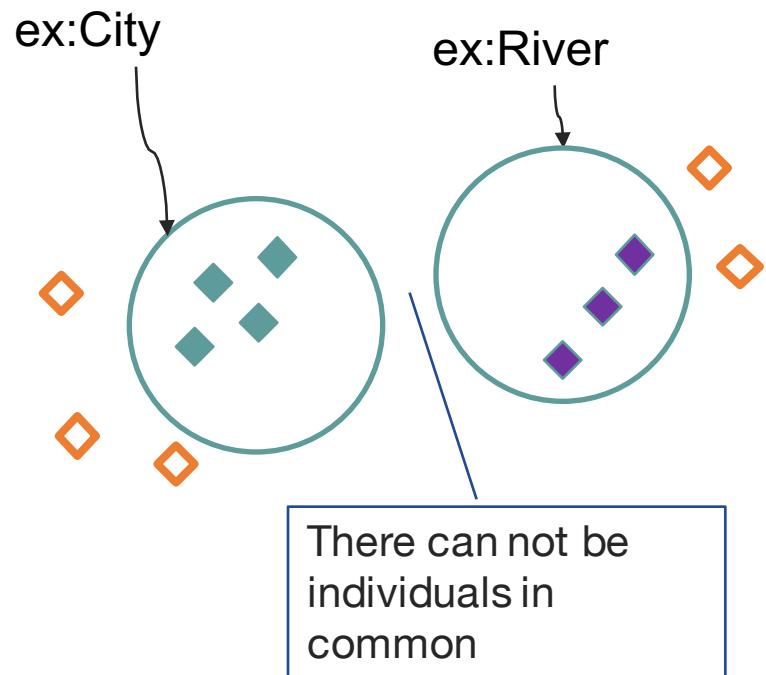
ex:Waterfall $\xrightarrow{\text{owl:equivalentClass}}$ onto:Cascade





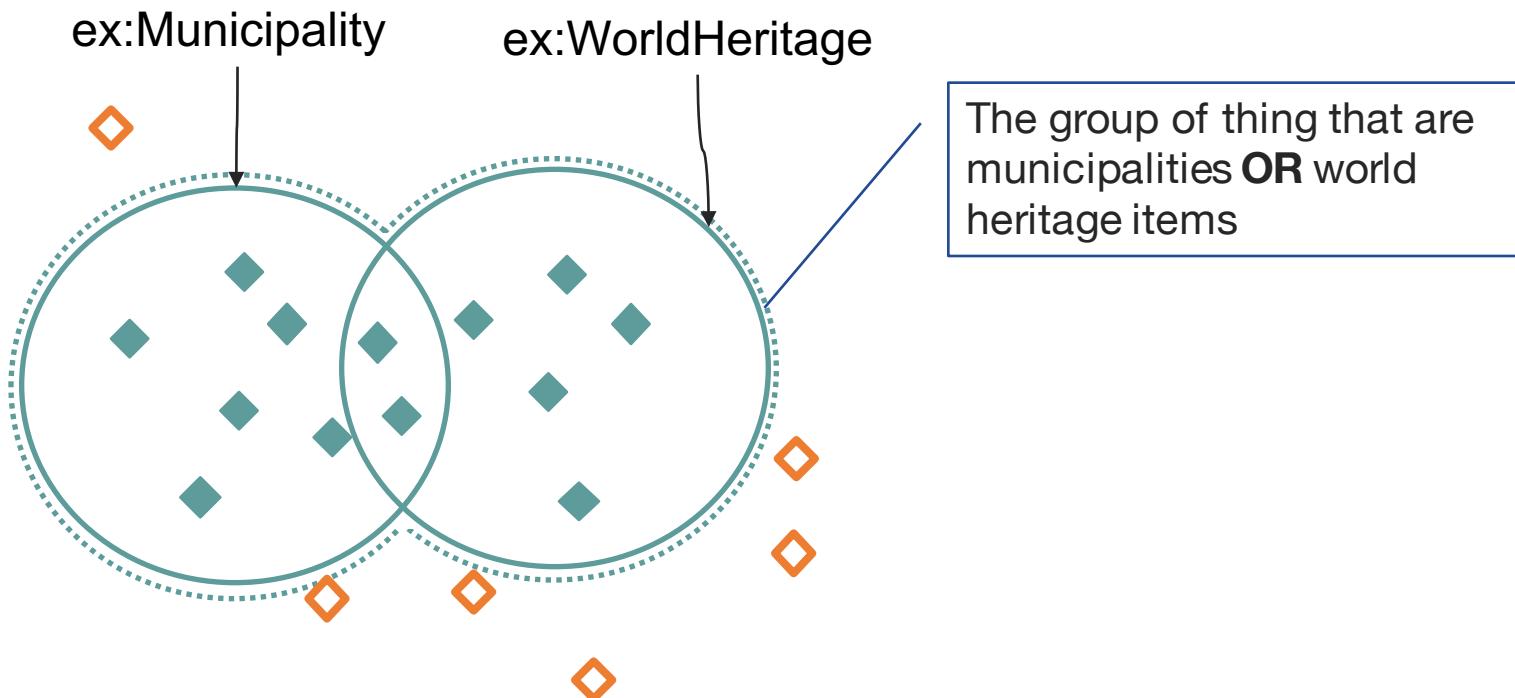
■ owl:disjointWith

- An individual can not belong to more than one of the involved classes
- The intersection is the empty set



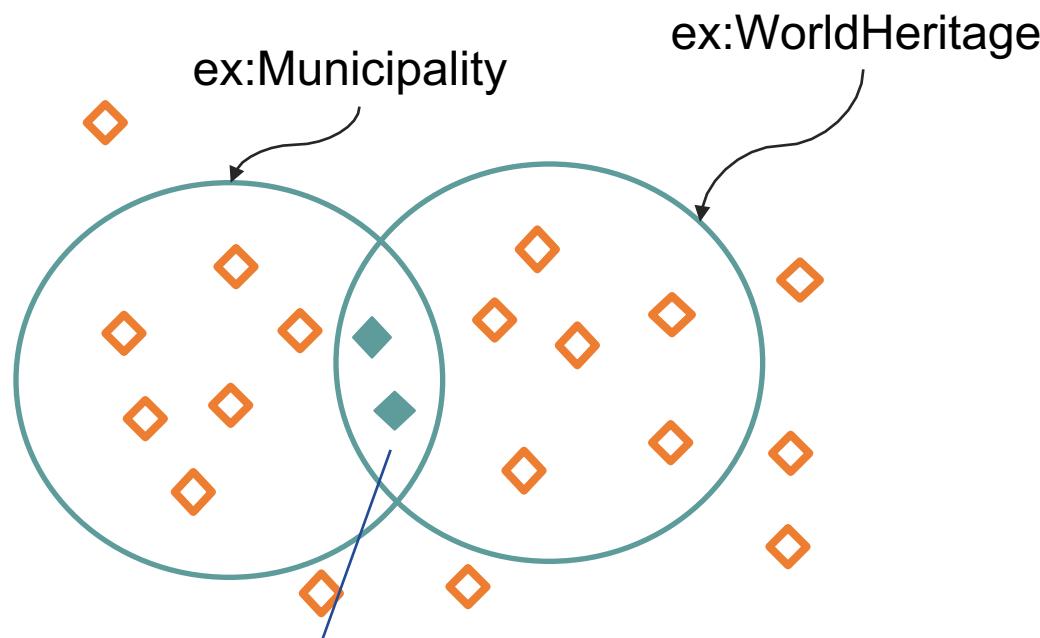
- **owl:unionOf**

- An individual could belong to one or more of the classes involved
- **OR** logic



- **owl:intersectionOf**

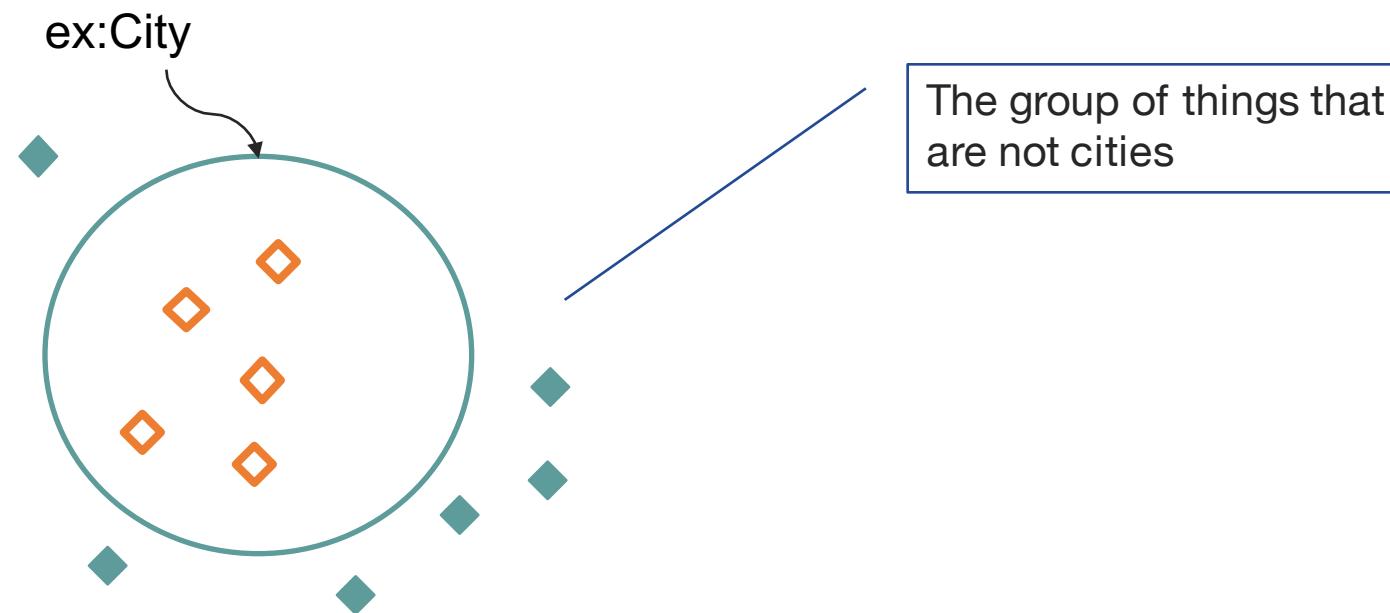
- An individual belongs to **all** classes involved
- **AND** logic



The group of things that are municipalities **AND** world heritage items

- **owl:complementOf**

- Describes the individuals that do not belong to the indicated class





- In your model
- Review your conceptualization and add information (when it makes sense) about:
 - Which classes could be equivalents
 - *A gig is the same as a concert*
 - Two classes could be disjoint
 - *Artists are disjoint with songs*
 - A class is the union of other two classes
 - *Person is the union of Man and Woman*
 - A class is the intersection of other two classes
 - *Woman is the intersection of Person and Female*
 - A class is complement of another
 - *Woman is complement of Man*

- OWL
 - Classes
 - Axioms
 - **Properties**
 - Characteristics
 - Individuals

rdfs:Property

owl:ObjectProperty
≈ relationships



owl:DatatypeProperty
≈ attributes

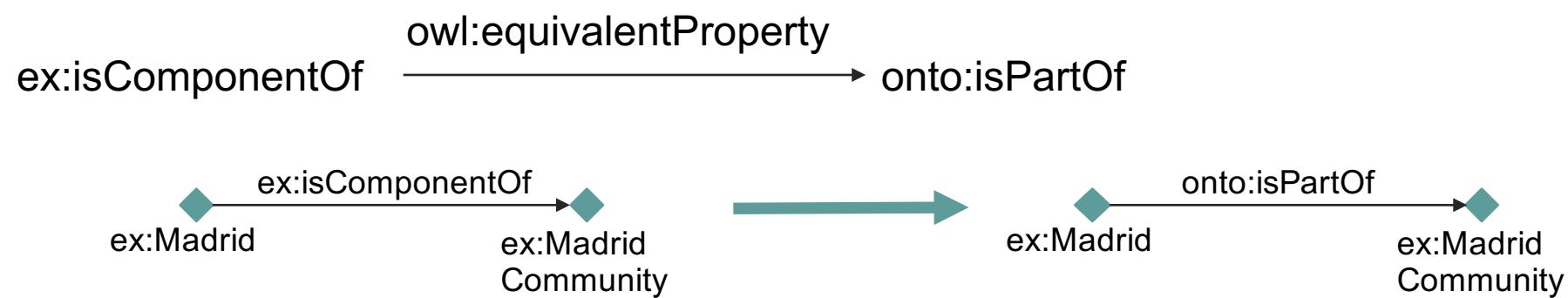




OWL elements. Properties. *equivalentProperty*

▪ owl:equivalentProperty

- When there is a property between two elements (two individuals or an individual and a value), the equivalent property is also true for the pair of elements
- Applicable to *object properties (relations)* and *datatype properties (attributes)*.



■ owl:inverseOf

- When there is a relations between two individuals A (subject) and B (object), the inverse relation is true between the individuals B (subject) and A (object).
- Applicable only to *object properties*.

ex:isPartOf



ex:hasPart





OWL elements. *Properties. FunctionalProperty*

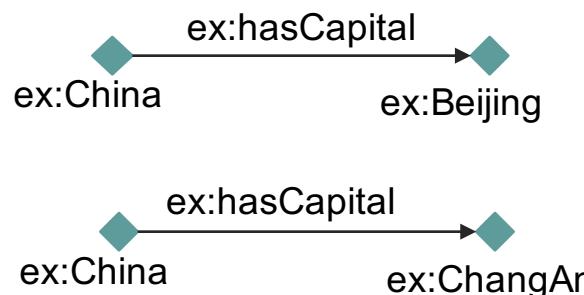
■ owl:FunctionalProperty

- It can only take one value per individual in the subject.
- Applicable to *object properties* and *datatype properties*.

owl:FunctionalProperty



ex:hasCapital

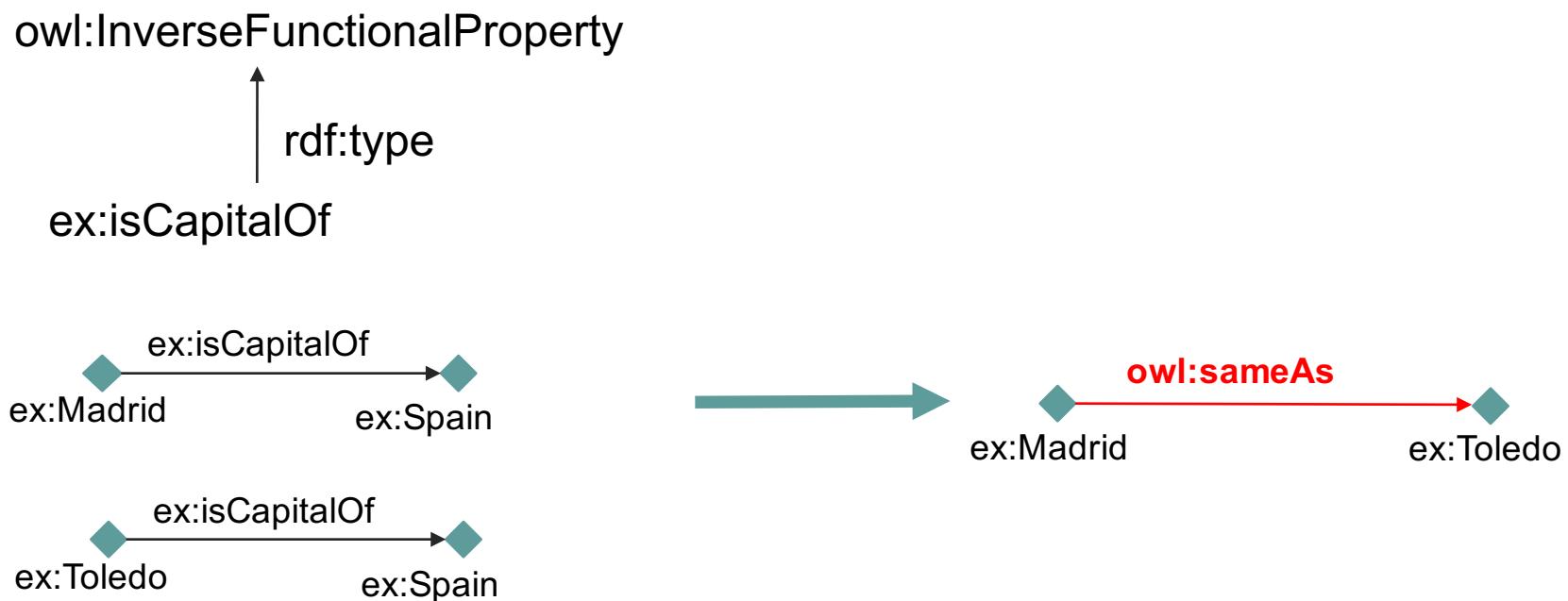




OWL elements. *Properties. InverseFunctionalProperty*

▪ owl:InverseFunctionalProperty

- There can only be one instance as subject per value of the object. The value of the subject is “fixed”
- Applicable only to *object properties* in OWL DL and to *object properties* and *datatype properties* in OWL Full.





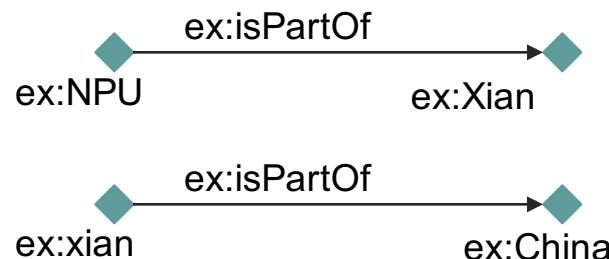
■ owl:TransitiveProperty

- When a relation holds between the individuals **A** and **B** and between **B** and **C**, it also holds between **A** and **C**.
- Applicable only to *object properties*.

owl:TransitiveProperty



ex:isPartOf





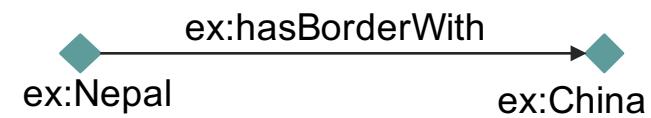
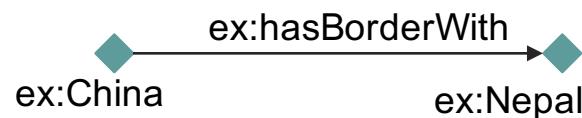
▪ owl:SymmetricProperty

- When a relation holds between two individuals A (subject) and B (object), if it is symmetric, the relations also holds between B (subject) and A (object).
- Applicable only to *object properties*.

owl:SymmetricProperty



ex:hasBorderWith



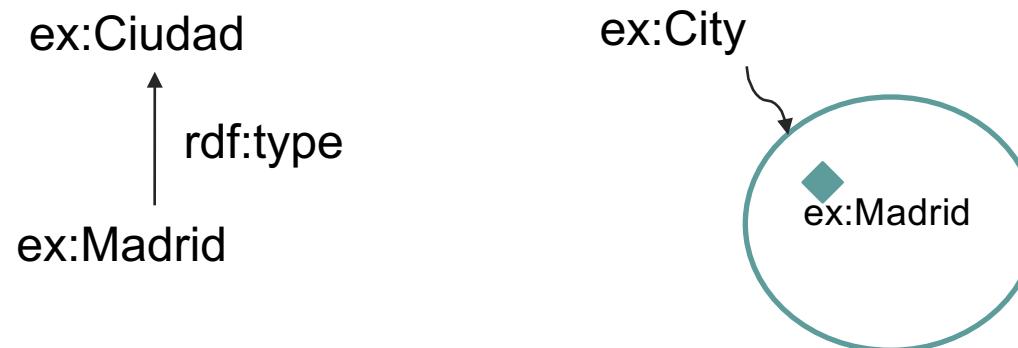


- In your model
- Review your conceptualization and add information (when it makes sense) about:
 - *Domain and ranges of properties*
 - *Hierarchies of properties*
 - *Equivalent properties*
 - *Inverse properties*
 - *Functional properties (or inverse functional)*
 - *Transitive properties*
 - *Symmetric properties*

- OWL
 - Classes
 - Axioms
 - Properties
 - Characteristics
 - **Individuals**

- **rdf:typeOf**

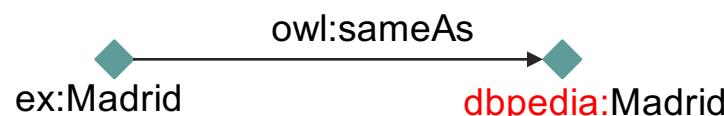
- Indicates the class or classes the individual belongs to





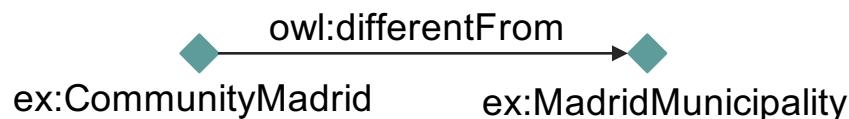
- **owl:sameAs**

- Declare that two URIs identify the same individual
- It is defined between instances or individuals



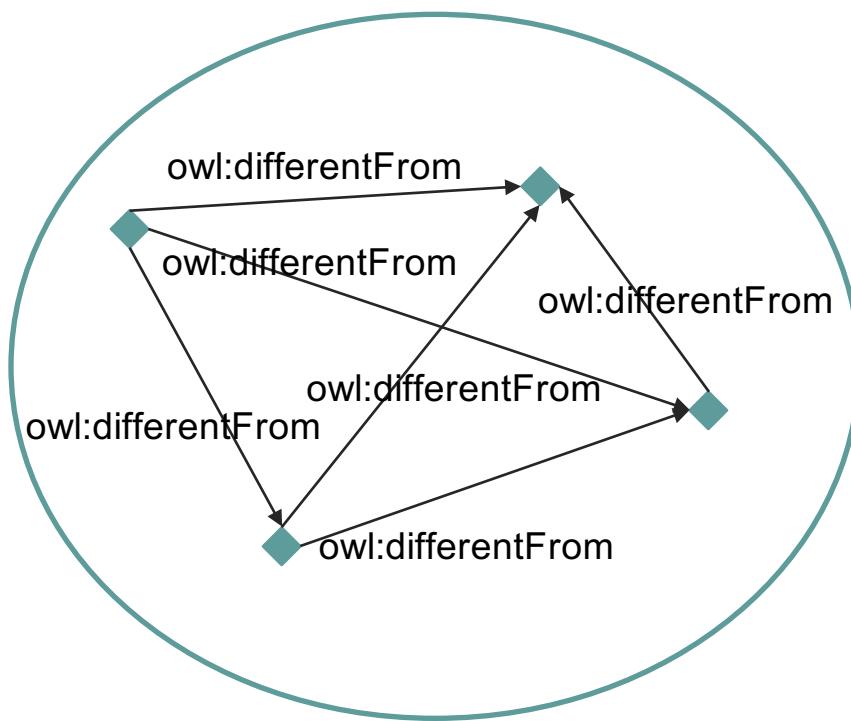
- **owl:differentFrom**

- Declare that two URIs identify different individuals



- **owl:AllDifferent**

- Declare that all URIs indicated identify different individuals
- Normally used to force the *unique name assumption*



- *Open World Assumption vs Closed World Assumption*
 - OWL follows OWA
 - The lack of evidence about a fact does not imply that the fact is false.
- *Non unique name assumption*
 - Different names do not identify necessarily different individuals.
- Property constraints
 - **owl:allValuesFrom**
 - **owl:someValuesFrom**
 - **owl:hasValue**
 - **owl:maxCardinality**
 - **owl:minCardinality**
 - **owl:cardinality**
- OWL 2
 - Additional constructs

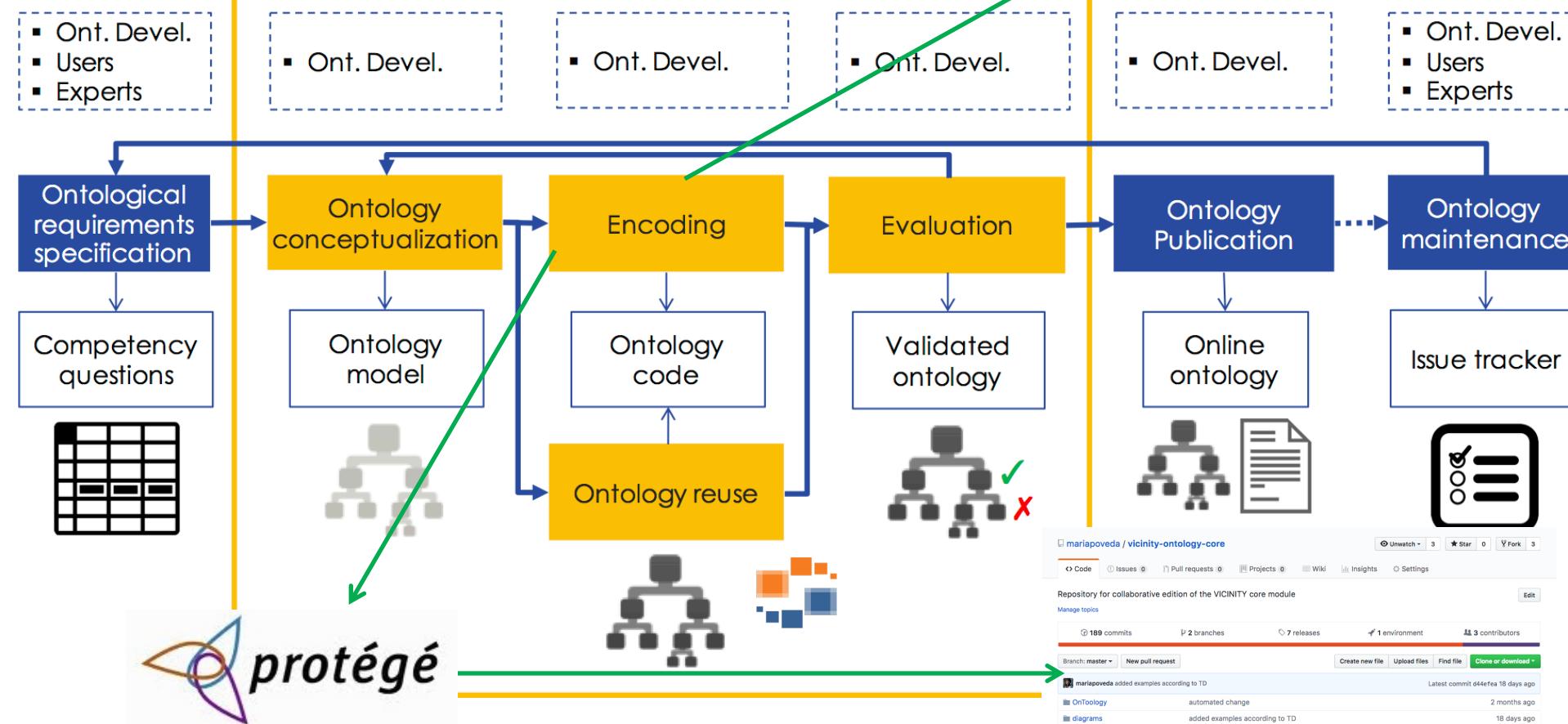
Implementation - Encoding



- Ont. Devel.
- Users
- Experts

Implementation

Openly managed
in GitHub



GitHub repository

<https://github.com/mariapoveda/vicinity-ontology-wot>

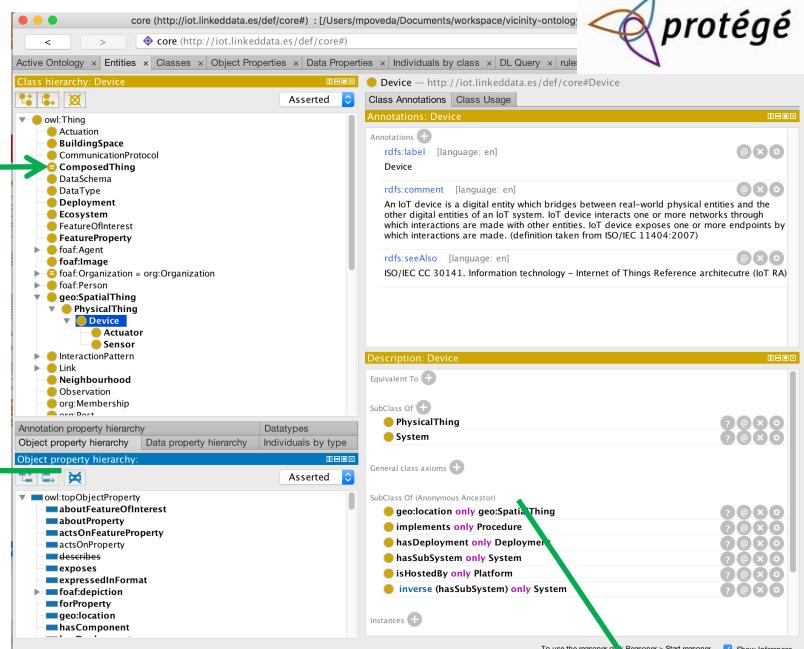
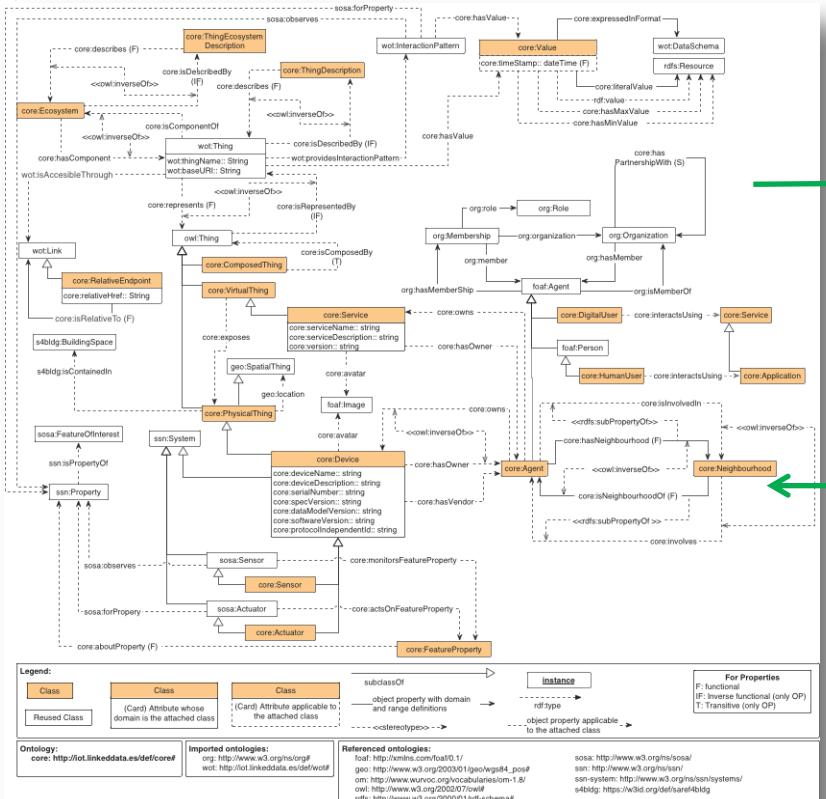
<https://github.com/mariapoveda/vicinity-ontology-core>

...

- Hands on



Implementation - Encoding



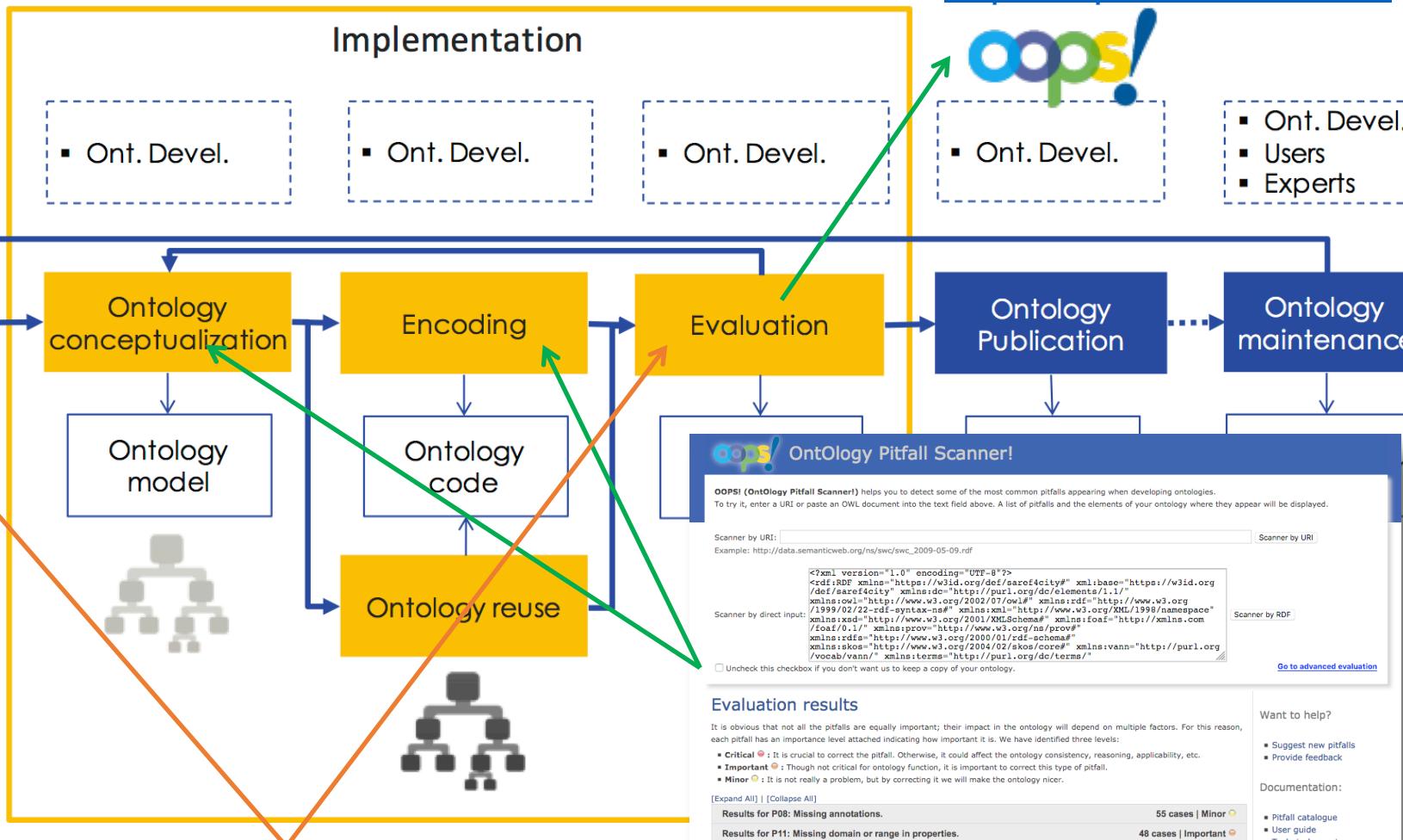
```

<rdf:RDF xmlns="http://iot.linkeddata.es/def/core">
  <owl:Ontology rdf:about="http://iot.linkeddata.es/def/core#">
    <owl:imports rdf:resource="http://iot.linkeddata.es/def/wot#"/>
    <owl:imports rdf:resource="http://www.w3.org/ns/org#"/>
    <owl:imports rdf:resource="http://www.w3.org/ns/ssn#"/>
    <owl:imports rdf:resource="https://w3id.org/s4bdd/4bdd#"/>
    <dc:creator rdf:resource="http://www.eog-upm.net/#"/>
    <dc:title rdf:lang="en" rdf:resource="http://www.eog-upm.net/index.php/en/universitystaff/402-fserena/"/>
    <terms:created rdf:resource="http://purl.org/dc/terms/created"/>
    <terms:license rdf:resource="http://purl.org/NET/officials/cc-by-0.0"/>
    <vann:preferredNamespacePrefix vann:preferredNamespaceUri="http://iot.linkeddata.es/def/core#"/>
    <vann:preferredNamespacePrefix vann:preferredNamespaceUri="http://iot.linkeddata.es/def/core#vann:preferredNamespaceUri"/>
    <rdfs:comment vann:lang="en">
      This ontology represents the core terms to allow interoperability in an IoT context based on VICINITY technological solutions.
    </rdfs:comment>
    <owl:versionInfo 0.2.1.1>
      <owl:versionInfo>0.2.1.1</owl:versionInfo>
    </owl:Ontology>
  </owl:Ontology>
  // Annotation properties
  // Object Properties
  // Data Properties
  // Individuals by type
  // General class axioms
  // SubClass Of (Anonymous Ancestor)
  // geo:location only geo:SpatialThing
  // implements only Procedure
  // actsOnFeatureProperty
  // describes
  // exposes
  // expressedInFormat
  // foaf:depiction
  // forProperty
  // geo:location
  // hasComponent
  Instances
  To use the reasoner click Reasoner > Start reasoner
  Show Inferences

```

Implementation - Evaluation

<http://oops.linkeddata.es>



Ongoing work: tests from requirements

Online and integrated in OnToology
with result in your GitHub repository

According to the highest importance level of pitfall found in your ontology the conformance badge suggested is "Important pitfall" (see below). You can use the following HTML code to insert the badge within your ontology documentation:

Evaluation - OOPS! – OntOlogy Pitfall Scanner!

- Implements the **48** detection methods for **33** pitfalls
 - Pitfalls selection
 - Selection by dimensions and aspects
- Web user interface <http://oops.linkeddata.es/>
- Web service <http://oops-ws.oeg-upm.net/>

The screenshot shows the OntOlogy Pitfall Scanner interface with the following components:

- URI input:** A text field with placeholder text "Example: http://data.semanticweb.org/ns/swc/ontology#hasPart".
- OWL code input:** A text area containing OWL code with a checkbox below it labeled "Uncheck this checkbox if you're using namespaces".
- Pitfall description:** A section for describing the pitfall, with a note about checking the box if using namespaces.
- Affected elements:** A list of URLs for relationships without inverses.
- Pitfall name:** A large blue header for the results.
- Results for P04: Creating unconnected ontology elements.**
- Results for P05: Defining wrong inverse relationships.**
- Results for P08: Missing annotations.**
- Results for P11: Missing domain or range in properties.**
- Results for P12: Equivalent properties not explicitly declared.**
- Results for P13: Inverse relationships not explicitly declared.**
- Pitfall frequency:** A summary box showing "11 cases | Minor".
- Importance level:** A summary box showing "2 cases | Low".
- RDF code:** A detailed view of the RDF code for the detected pitfall.

Annotations on the left side map labels to specific parts of the interface:

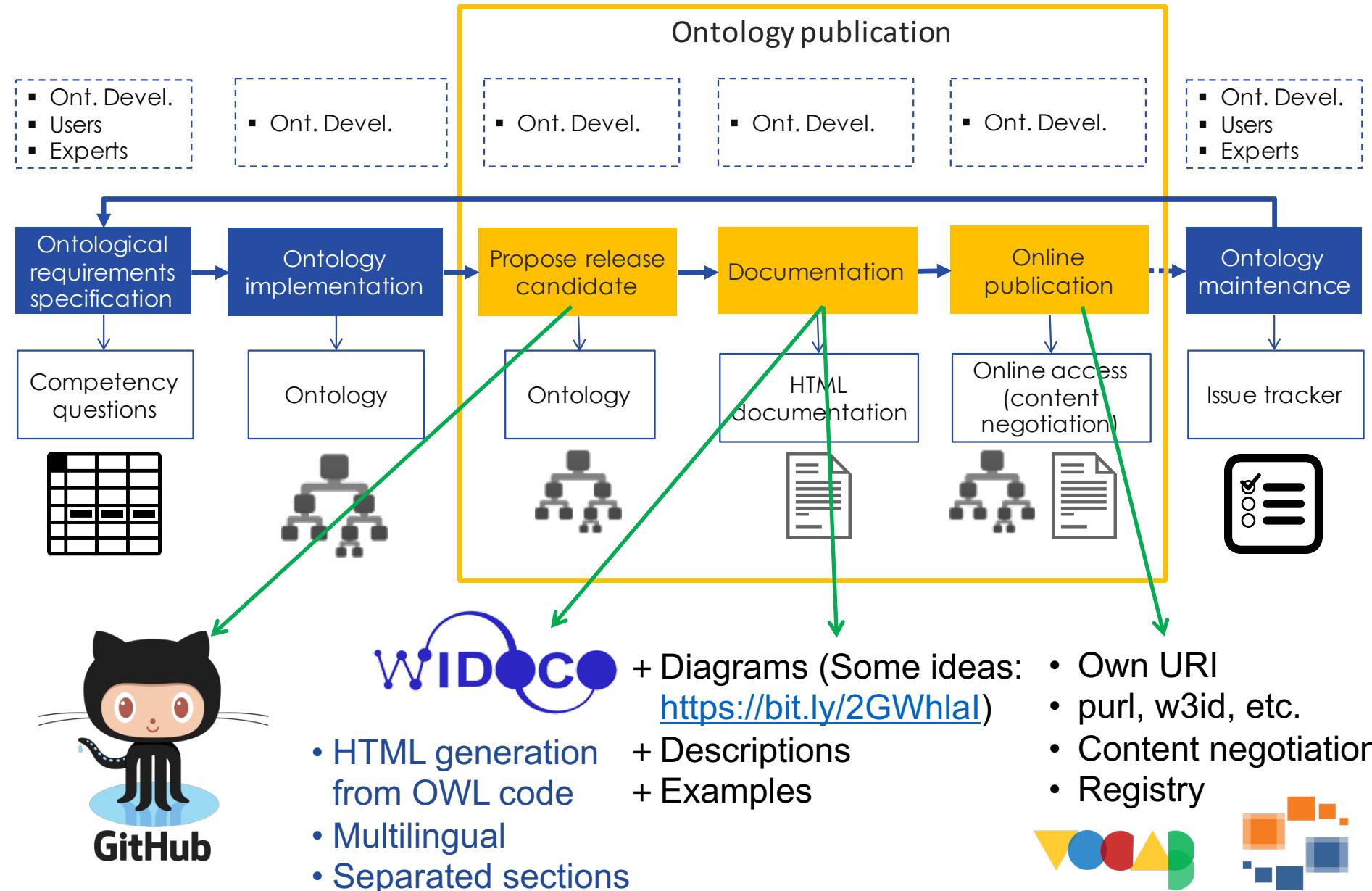
- "Pitfall description" points to the "Pitfall description" section.
- "Affected elements" points to the list of URLs under "Results for P13".
- "URI input" points to the "URI input" field.
- "OWL code input" points to the "OWL code input" text area.

Annotations on the right side map labels to specific parts of the results:

- "Pitfall frequency" points to the "11 cases | Minor" summary box.
- "Importance level" points to the "2 cases | Low" summary box.

Detailed description of the RDF code (part of the "Pitfall frequency" summary):

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:owl="http://www.w3.org/2002/07/owl#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:oops="http://www.oeg-upm.net/oops#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://www.oeg-upm.net/oops#suggestion">
<rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
</rdf:Description>
<rdf:Description rdf:about="http://www.oeg-upm.net/oops/fdealaa6-71d6-4557-a17a-dc3244ff536b">
<oops:hasCode rdf:datatype="http://www.w3.org/2001/XMLSchema#string">P10</oops:hasCode>
<oops:hasName rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Missing disjointness [1, 2, 3]</oops:hasName>
<oops:hasDescription rdf:datatype="http://www.w3.org/2001/XMLSchema#string">The ontology lacks disjoint axioms between classes or between properties that should be defined as disjoint.</oops:hasDescription>
<rdf:type rdf:resource="http://www.oeg-upm.net/oops#pitfall"/>
<oops:hasImportanceLevel rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Important</oops:hasImportanceLevel>
<oops:hasNumberAffectedElements rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">1</oops:hasNumberAffectedElements>
</rdf:Description>
<rdf:Description rdf:about="http://www.oeg-upm.net/oops/496ae03d-48c6-406d-8d07-530bf05c9ac1">
<oops:hasCode rdf:resource="http://www.oeg-upm.net/oops/fdealaa6-71d6-4557-a17a-dc3244ff536b"/>
<rdf:type rdf:resource="http://www.oeg-upm.net/oops#response"/>
</rdf:Description>
<rdf:Description rdf:about="http://www.oeg-upm.net/oops#pitfall">
<rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
</rdf:Description>
</rdf:RDF>
```



Publication (bundle)



```

<owl:RDF xmlns="http://iot.linkeddata.es/def/core#>
<owl:Ontology rdf:about="http://iot.linkeddata.es/def/core#>">
<owl:imports rdf:resource="http://iot.linkeddata.es/def/vicinity#"/>
<owl:imports rdf:resource="http://www.w3.org/2002/07/owl#"/>
<owl:imports rdf:resource="http://www.w3.org/2000/01/rdf-schema#"/>
<owl:publisher rdf:resource="http://www.vicinity.net/#"/>
<owl:title xml:lang="en">VICINITY core model</owl:title>
<owl:comment rdf:resource="http://www.w3.org/2000/01/rdf-schema#"/>
<owl:license rdf:resource="http://www.gnu.org/licenses/lgpl-2.1.html#"/>
<owl:preferredNamespacePrefId>vnt-core</owl:preferredNamespacePrefId>
<owl:preferredNamespaceUri>http://iot.linkeddata.es/def/core#</owl:preferredNamespaceUri>
<owl:comment xml:lang="en">
  This ontology represents the core terms to allow interoperability in an IoT context based on VICINITY technological solutions.
</owl:comment>
<owl:versionInfo>0.2.1</owl:versionInfo>
<owl:Ontology>
</owl:Ontology>
  
```

// Annotation properties

```

<owl:AnnotationProperty rdf:about="http://iot.linkeddata.es/def/elements/1.1/resource">
<owl:AnnotationProperty rdf:about="http://iot.linkeddata.es/def/elements/1.1/source">
<owl:AnnotationProperty rdf:about="http://iot.linkeddata.es/def/terms/contributor">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2002/07/owl#cardinality">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2002/07/owl#cardinality">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2003/06/sw-vocab-status/ns/term_status">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2003/06/sw-vocab-status/ns/term_status">
  
```

// Object Properties

```

<> http://purl.org/dc/elements/1.1/resource <>
<owl:AnnotationProperty rdf:about="http://iot.linkeddata.es/def/elements/1.1/resource">
<owl:AnnotationProperty rdf:about="http://iot.linkeddata.es/def/elements/1.1/source">
<owl:AnnotationProperty rdf:about="http://iot.linkeddata.es/def/terms/contributor">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2002/07/owl#cardinality">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2002/07/owl#cardinality">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2003/06/sw-vocab-status/ns/term_status">
<owl:AnnotationProperty rdf:about="http://www.w3.org/2003/06/sw-vocab-status/ns/term_status">
  
```



Vicinity core model

Revision: 0.2.1

Authors: María Poveda Villalón (Ontology Engineering Group)
Paul García Castro (Ontology Engineering Group)
Fernando Serena (Ontology Engineering Group)

Download serialization: Format N Triples Format RDF/XML Format TRIX

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[Provenance of this page](#)

Abstract
This ontology represent the core terms to allow interoperability in an IoT context based on VICINITY technological solutions.

Table of contents

- 1. Introduction
- 1.1 Namespace declarations
- 2. Vicinity core model: Overview
- 3. Vicinity core model: Description
- 4. Cross reference to VICINITY core model classes, properties and dataproperties
- 4.1. 4.1.1 Object Properties
- 4.2. Object Properties
- 4.3. Data Properties
- 5. References
- 6. Acknowledgements

1. Introduction [back to ToC](#)

The VICINITY approach is based on a modular ontology network in which existing standard ontologies will be reused whenever possible. In summary, the ontology network will be composed by: 1) cross-domain ontologies

Content Negotiation



language en



Server

ontology Home Step by Step About FAQ Publications Logout My repositories

Pending

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	mariapoveda/saref-e	Ready	100.0%	28-Nov-2018
Ontology	ontology/core.ttl			
tests/testsuite_ISOIEC30141.ttl				
tests/testsuite_requirements.ttl				
Update Configuration				
Stop Watching				

	mariapoveda/vicinity	Ready	100.0%	07-Nov-2018
Ontology	ontology/core.ttl			
tests/testsuite_ISOIEC30141.ttl				
tests/testsuite_requirements.ttl				
Update Configuration				
Stop Watching				

	mariapoveda/vicinity	Ready	100.0%	21-Nov-2017
Ontology	ontology/core.ttl			
tests/testsuite_ISOIEC30141.ttl				
tests/testsuite_requirements.ttl		syntax error in tests/testsuite_requirements.ttl	100.0%	
Update Configuration				
Stop Watching				

	mariapoveda/wot-ontology	Ready	100.0%	29-May-2018
Ontology	ontology/core.ttl			
tests/testsuite_ISOIEC30141.ttl				
tests/testsuite_requirements.ttl				
Update Configuration				
Stop Watching				

	mariapoveda/inia-ontology	Ready	100.0%	05-Dec-2017
Ontology	ontology/core.ttl			
tests/testsuite_ISOIEC30141.ttl				
tests/testsuite_requirements.ttl				
Update Configuration				
Stop Watching				

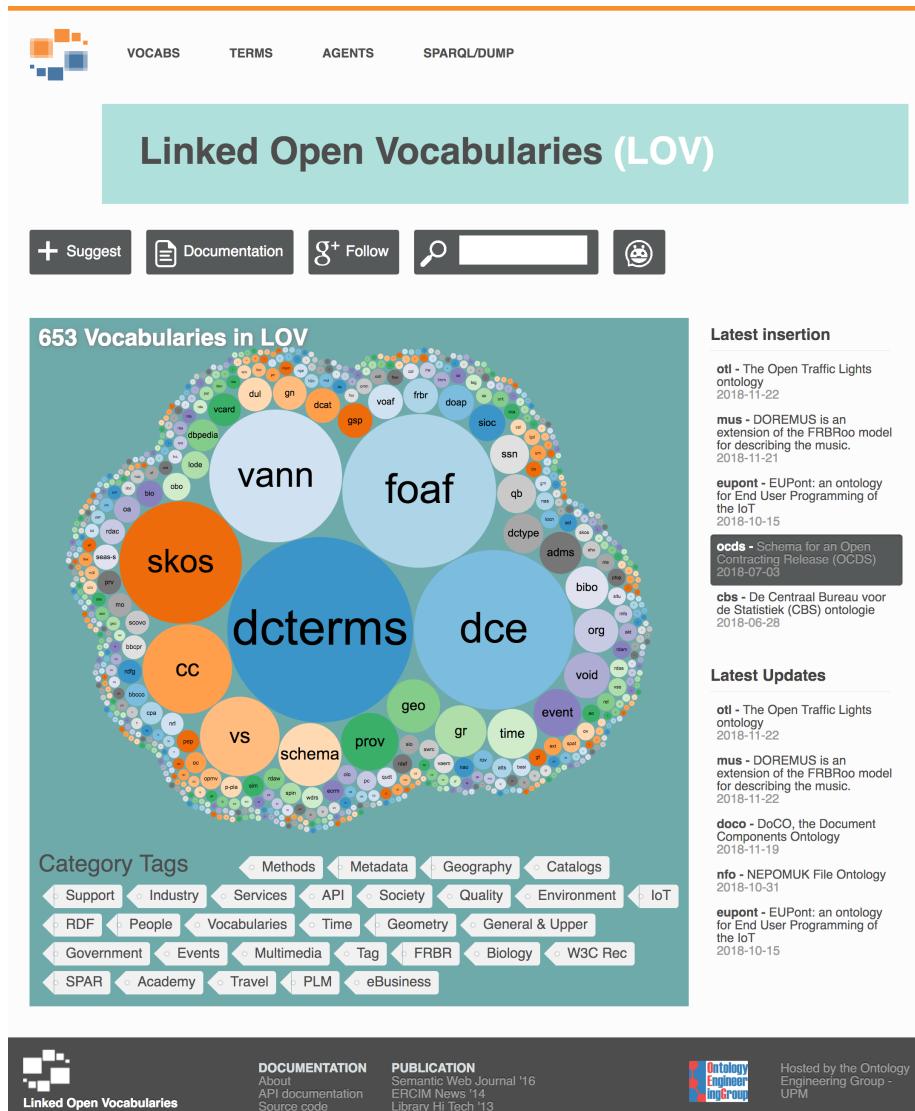
upload bundle

Download bundle <http://iot.linkeddata.es/def/core#>

<https://lov.linkeddata.es>

- Mission: promote and facilitate the reuse of well documented vocabularies in the Linked Data ecosystem

- Vocabularies registry and index
- Datalift
 - <http://datalift.org/>
- Started at 2011
- Hosted by OEG



VOCABS TERMS AGENTS SPARQL/DUMP

Linked Open Vocabularies (LOV)

+ Suggest Documentation G+ Follow Search Chat

595 Vocabularies in LOV

Category Tags

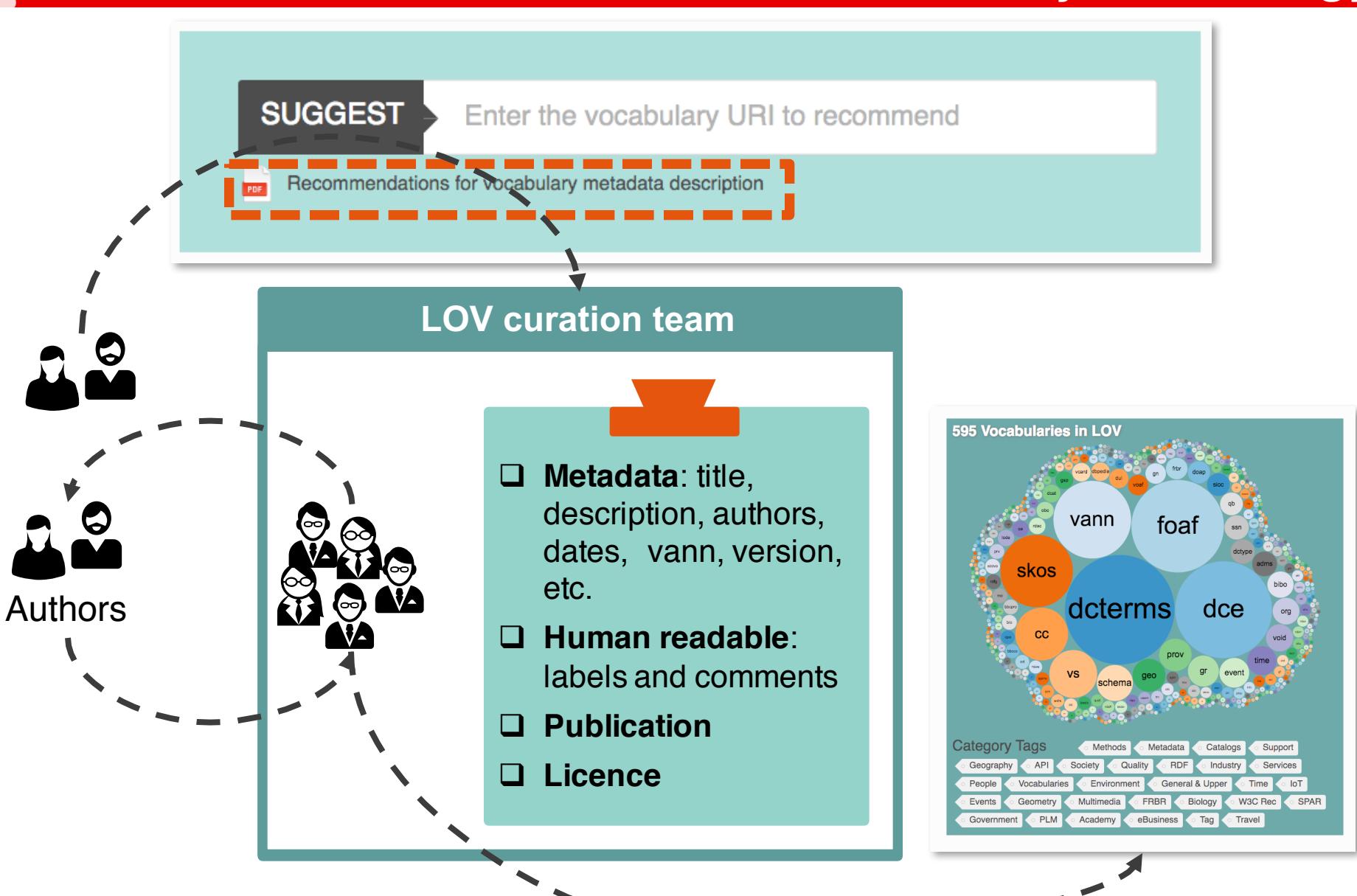
- Methods
- Metadata
- Catalogs
- Support
- Geography
- API
- Society
- Quality
- RDF
- Industry
- Services
- People
- Vocabularies
- Environment
- General & Upper
- Time
- IoT
- Events
- Geometry
- Multimedia
- FRBR
- Biology
- W3C Rec
- SPAR
- Government
- PLM
- Academy
- eBusiness
- Tag
- Travel

Latest insertion

- losp - Linked open specialties
RF
2017-03-09
- san-lod - SAN Ontologia
2017-02-07
- sto - i40 Standards Landscape Vocabulary
2017-01-29
- rami - rami - Reference Architecture Model
2017-01-29
- aml - AutomationML Ontology
2017-01-26

Latest Updates

- losp - Linked open specialties
RF
2017-03-10
- rdf - The RDF Concepts Vocabulary
2017-03-09
- oa - Open Annotation Data Model
2017-02-28
- san-lod - SAN Ontologia
2017-02-07
- sto - i40 Standards Landscape Vocabulary
2017-01-29



The screenshot shows a GitHub issue page for issue #38, titled "Erroneous domain definitions". The issue was opened by vcharpenay on Jun 12, 2017, and has 2 comments. The first comment from vcharpenay discusses domain axioms, mentioning specific RDF triples and their meanings. The second comment from mariapoveda expresses a preference to keep the erroneous domains in the ontology. A sidebar on the right lists other issues related to the ontology, such as "add a queueable attribute to action element", "Interaction patterns cardinality", and various WoT-related issues.

- Ont. Devel.
- Users
- Ont. Devel.
- Ont. Devel.

Erroneous domain definitions #38

Closed vcharpenay opened this issue on Jun 12, 2017 · 2 comments

vcharpenay commented on Jun 12, 2017

Some domain axioms seem erroneous:

- :providesInteractionPattern rdfs:domain :InteractionPattern . I suppose you mean rdfs:range ?
- :name rdfs:domain :Thing leads to the fact that all interaction patterns are also things, which is unwanted, I guess.

In general, are domain/range axioms supposed to remain in the ontology or removed?

mariapoveda commented on Jun 12, 2017

Thanks for the comments I'll update the ontology.

I'd rather to keep them in the ontology.

mariapoveda added a commit that referenced this issue on Jun 12, 2017

0.0.7 replace erroneous domains issue #38

mariapoveda commented on Jun 12, 2017

Closed in ea30b5a

mariapoveda closed this on Jun 12, 2017

3 Open ✓ 8 Closed

add a queueable attribute to action element #43 by suifo4229 was closed 21 days ago

Erroneous domain definitions #38 by vcharpenay was closed on Jun 12, 2017

Interaction patterns cardinality #30 by mariapoveda was closed on Apr 25, 2017

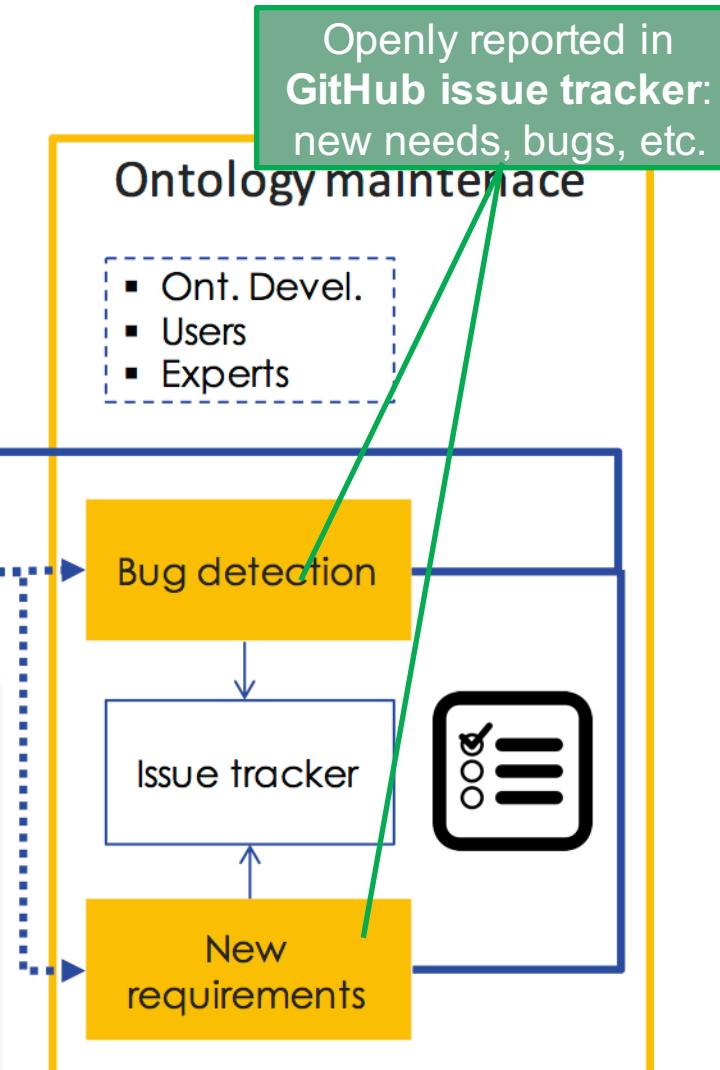
Delete DigitalRepresentation #20 by mariapoveda was closed on Apr 5, 2017

WoT5 and relation with Thing #5 by mariapoveda was closed on Feb 16, 2017

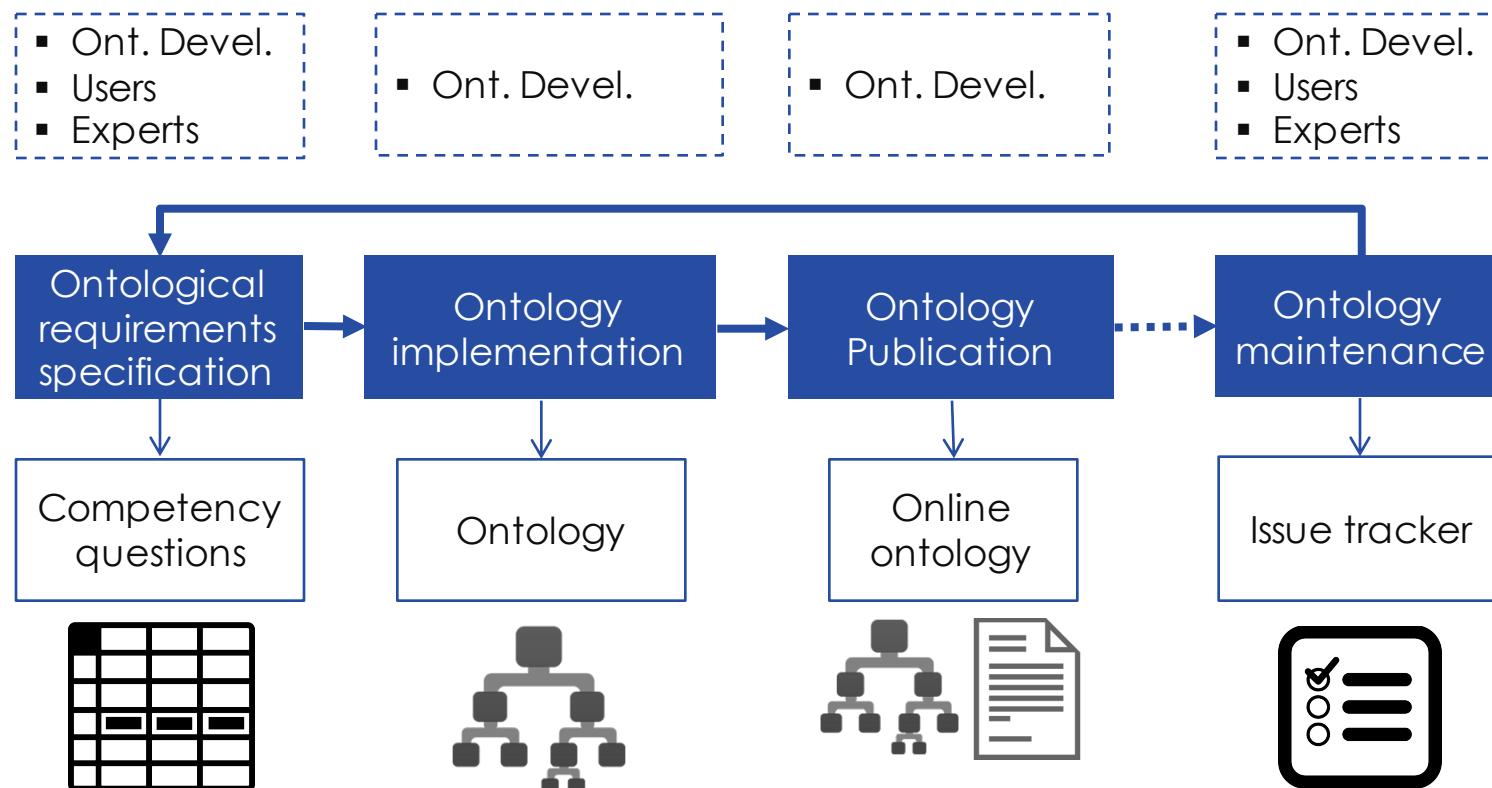
WoT1 terminology doubt #4 by mariapoveda was closed on Mar 7, 2017

WoT11 #2 by mariapoveda was closed on Feb 16, 2017

WoT11 #1 by mariapoveda was closed on Feb 16, 2017



Ontology development process overview



Aiming at bringing all this together...

Methodology in practice

<http://vicinity.io.linkeddata.es/>

The screenshot shows a web-based ontology repository interface. At the top, there's a navigation bar with tabs: 'Ontologies' (which is active), 'Ontology report', and 'Ontology testing'. Below the navigation bar are several circular icons representing different stages of the methodology:

- Evaluation: A green circle with 'Evaluation' at the top and 'oops!' at the bottom.
- Testing: A green circle with 'Testing' at the top and two blue gears in the center.
- VICINITY: The central logo, which is a stylized 'V' followed by the word 'VICINITY' in blue.
- Portal: A green circle with 'Portal' at the top and the 'vocab' logo below it.
- Version control: A green circle with 'Version control' at the top and a GitHub icon in the center.
- Issue tracker: A green circle with 'Issue tracker' at the top and a GitHub icon in the center.
- Requirements: A green circle with 'Requirements' at the top and a document icon with a gear inside.
- Deployment: A green dashed circle with 'Deployment' at the top and an infinity symbol icon inside.
- Documentation: A green circle with 'Documentation' at the top and the WIDOCO logo below it.

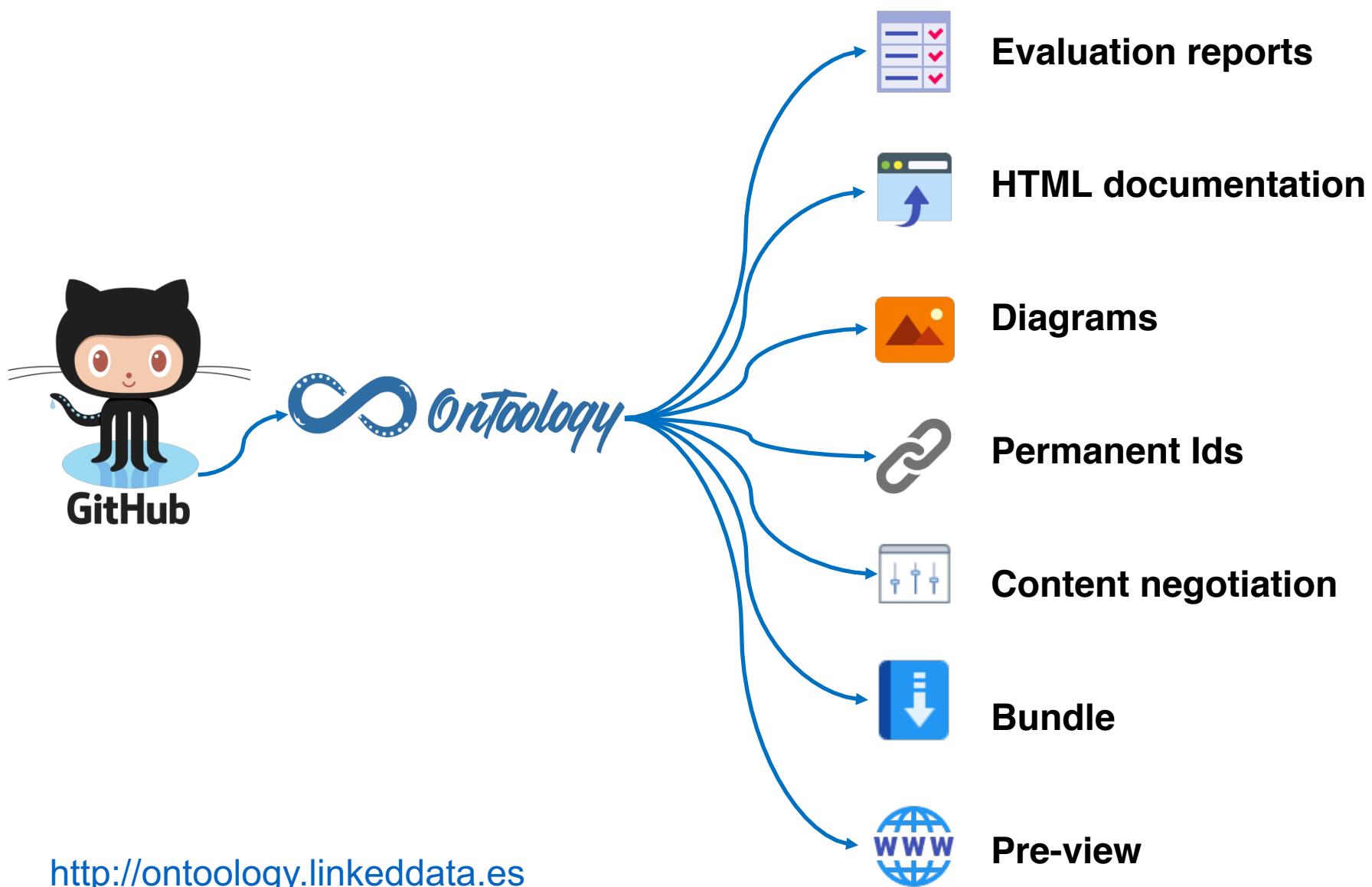
Below these icons, there's a message: "Here you can find the list of ontologies developed in the VICINITY GitHub repository for VICINITY project". It also says "If you want to contribute development, please use the GitHub issues section". There's a "Filter by title:" input field and a search button.

The main content area is a table listing five ontologies:

Ontology	Description	Repository	Issue tracker	Requirements	Releases
Ontology model for Web of Things ⓘ	This ontology aims to model the Web of Things domain according to the w3c Interest Group (http://w3c.github.io/wot/)	wot-ontology	ontology issues	ontology requirements	ontology releases
Vicinity core model ⓘ	This ontology represent the core terms to allow interoperability in an IoT context based on VICINITY technological solutions.	vicinity-ontology-core	core issues	core requirements	core releases
Vicinity WoT mappings model ⓘ	This ontology represent the mapping definitions between WoT to allow interoperability in an IoT context based on VICINITY ... See more	vicinity-ontology-wot-mappings	mappings issues	mappings requirements	mappings releases
Vicinity adapters model ⓘ	This ontology represents the terms needed to represent the devices involved in the VICINITY pilot cases	vicinity-ontology-adapters	adapters issues		adapters releases
Ontology model for datatypes ⓘ	This ontology aims to model the datatypes commonly used in the Web of Things domain	vicinity-ontology-datatypes	datatypes issues		datatypes releases

This slide has been taken from Raúl García Castro presentation at EMSE

Handle versions and distributed environments



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Add repository to track

Watch this repo

Choose one of the below repo by clicking on it

	mariapoveda/saref-ext	Ready	100.0%					15-Nov-2017
▼	mariapoveda/vicinity-ontology-core	Ready	100.0%					21-Nov-2017
Ontology			Diagrams	Evaluation	Documentation	Publish	Bundle	
	ontology/core.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
	tests/testsuite_ISOIEC30141.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	tests/testsuite_SPRINT2.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Update Configuration							Stop Watching	
▶	mariapoveda/vicinity-ontology-wot-mappings	Ready	syntax error in tests/testsuite_requirements.ttl	100.0%				21-Nov-2017
▶	mariapoveda/wot-ontology	Ready		100.0%				20-Nov-2017
▶	mariapoveda/wot-thing-description	Ready		100.0%				27-Sep-2017
▶	mariapoveda/inia-ontology	Ready		100.0%				27-Nov-2017
▶	mariapoveda/vocab	Ready		100.0%				20-Nov-2017

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mariapoveda/saref-ext	Ready	100.0%		15-Nov-2017
mariapoveda/vicinity-ontology-core	Ready	100.0%		21-Nov-2017
Ontology		Diagrams	Evaluation	Documentation
ontology/core.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
tests/testsuite_ISOIEC30141.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tests/testsuite_SPRINT2.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Update Configuration				Stop Watching
mariapoveda/vicinity-ontology-wot-mappings	Ready	syntax error in tests/testsuite_requirements.ttl 100.0%		21-Nov-2017
mariapoveda/wot-ontology	Ready	100.0%		20-Nov-2017
mariapoveda/wot-thing-description	Ready	100.0%		27-Sep-2017
mariapoveda/inia-ontology	Ready	100.0%		27-Nov-2017
mariapoveda/vocab	Ready	100.0%		20-Nov-2017

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RDF files management by repository

mariapoveda/vicinity-ontology-c		Ready	100.0%	Diagrams	Evaluation	Documentation	Publish	Bundle	15-Nov-2017
ontology	core.ttl			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21-Nov-2017
tests	testsuite_ISOIEC30141.ttl			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
tests	testsuite_SPRINT2.ttl			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Update Configuration								Stop Watching	
▶	mariapoveda/vicinity-ontology-wot-mappings	Ready	syntax error in tests/te stsuite_requirements.t tl	100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21-Nov-2017
▶	mariapoveda/wot-ontology	Ready		100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20-Nov-2017
▶	mariapoveda/wot-thing-descript ion	Ready		100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	27-Sep-2017
▶	mariapoveda/inia-ontology	Ready		100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	27-Nov-2017
▶	mariapoveda/vocab	Ready		100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20-Nov-2017

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When the ontology (RDF file) is updated, regenerate:

Choose one of the below repo by clicking on it

> mariapoveda/saref-ext	Ready	100.0%		15-Nov-2017
▼ mariapoveda/vicinity-ontology-c ore	Ready	100.0%		21-Nov-2017
Ontology			Diagrams Evaluation Documentation	Publish Bundle
ontology/core.ttl				
tests/testsuite_ISOIEC30141.ttl				
tests/testsuite_SPRINT2.ttl				
Update Configuration				Stop Watching
> mariapoveda/vicinity-ontology-wot-mappings	Ready	syntax error in tests/te stsuite_requirements.t tl 100.0%		21-Nov-2017
> mariapoveda/wot-ontology	Ready	100.0%		20-Nov-2017
> mariapoveda/wot-thing-descrip tion	Ready	100.0%		27-Sep-2017
> mariapoveda/inia-ontology	Ready	100.0%		27-Nov-2017
> mariapoveda/vocab	Ready			0-Nov-2017

Or when forcing the generation of resources

Using OnToology

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user/repo

Publish the ontology under a w3id URI

Choose one of the below repo by clicking on it

	mariapoveda/saref-ext	Ready	100.0%					15-Nov-2017
▼	mariapoveda/vicinity-ontology-c ore	Ready	100.0%					21-Nov-2017
	Ontology		Diagrams	Evaluation	Documentation			
	ontology/core.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
	tests/testsuite_ISOIEC30141.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	tests/testsuite_SPRINT2.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
			Update Configuration					
▶	mariapoveda/vicinity-ontology-wot-mappings	Ready	syntax error in tests/te stsuite_requirements.t tl	100.0%				21-Nov-2017
▶	mariapoveda/wot-ontology	Ready		100.0%				20-Nov-2017
▶	mariapoveda/wot-thing-descript ion	Ready		100.0%				27-Sep-2017
▶	mariapoveda/inia-ontology	Ready		100.0%				27-Nov-2017
▶	mariapoveda/vocab	Ready		100.0%				20-Nov-2017

Or download the resources needed to publish it in your server

Latest revision November, 2017
Ontology Engineering Group
Contact: ontology (at) delicias.dia.fi.upm.es
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Generate portal for the ontologies in the repo

user/repo

Go to portal

Watch this repo

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mariapoveda/saref-ext	Ready	<div style="width: 100%;">100.0%</div>		15-Nov-2017
mariapoveda/vicinity-ontology-core	Ready	<div style="width: 100%;">100.0%</div>		21-Nov-2017
Ontology		Diagrams	Evaluation	Documentation
ontology/core.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
tests/testsuite_ISOIEC30141.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tests/testsuite_SPRINT2.ttl		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Update Configuration				Stop Watching
mariapoveda/vicinity-ontology-wot-mappings	Ready	syntax error in tests/testsuite_requirements.ttl <div style="width: 100%;">100.0%</div>		21-Nov-2017
mariapoveda/wot-ontology	Ready	<div style="width: 100%;">100.0%</div>		20-Nov-2017
mariapoveda/wot-thing-description	Ready	<div style="width: 100%;">100.0%</div>		27-Sep-2017
mariapoveda/inia-ontology	Ready	<div style="width: 100%;">100.0%</div>		27-Nov-2017
mariapoveda/vocab	Ready	<div style="width: 100%;">100.0%</div>		20-Nov-2017



- Since 2015
- **531 ontologies from 113 repositories**
- Some examples:
 - opencitydata/medio-ambiente-contaminacion-acustica
 - opencitydata/medio-ambiente-calidad-aire
 - mariapoveda/wot-ontology
 - vcharpenay/wot-ontology
 - jpcik/medred
 - marianofl1971/dul-es
 - GeorgFerdinandSchneider/bot
 - ...



■ Ontology evaluation

- OOPS! OntOlogy Pitfall Scanner
<http://oops.linkeddata.es/>



A screenshot of the OOPS! OntOlogy Pitfall Scanner web application. At the top, there's a navigation bar with links like 'Home', 'About', 'Contact', 'Help', and 'Logout'. Below the navigation, there's a search bar with placeholder text 'Search for ontology' and a 'Search' button. The main area contains a large text box with ontology code, with several red highlights and annotations. There are also sections for 'Issues found' and 'Issues details'.

■ Vocabulary documentation

- HTML: Widoco
<https://github.com/dgarijo/Widoco/>
- Diagrams: AR2DTool
<http://ar2dtool.linkeddata.es/>



○ Vocabulary registry

- OEG vocabularies
<http://vocab.linkeddata.es/>
- Smart Cities <http://smartcity.linkeddata.es/>



○ Vocabulary distributed development

- OnToology <http://ontology.linkeddata.es/>



A screenshot of the OnToology distributed development platform. At the top, there's a header with 'user/repo' and a 'Watch this repo' button. Below that is a section titled 'Choose one of the below repo by clicking on it' with two repository entries: 'marispoveda/safe-ext' and 'marispoveda/vicinity-ontology-c'. Further down, there are tabs for 'Ontology', 'Diagrams', 'Evaluation', 'Documentation', 'Publish', and 'Bundle'. Under the 'Ontology' tab, there are links to 'ontology/core.ttl', 'tests/testsuite_ISOIEC30141.ttl', and 'tests/testsuite_SPRINT2.ttl'. At the bottom, there are buttons for 'Update Configuration' and 'Stop Watching'.

Thanks for your attention!

 mpoveda@fi.upm.es

 [mpovedavillalon](#)

 [thepetiteontologist](#)

 [@MariaPovedaV](#)

 [mariapoveda](#)

 [MariaPovedaVillalon](#)