

# Mobility Vocabulary Development & Showcase

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# Outline

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- Testing
  - ❖ Vocabulary Syntax Testing
  - ❖ Vocabulary Semantic Testing
  - ❖ End-User Application Testing / Test Case

# Vocabulary Syntax Testing

RDF Translator Tool: converts the .ttl files into RDF

Input  
(ttl  
format):

URI Input Field

```
@prefix mv: <http://eccenca.com/mobivoc/> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .
@prefix geo: <http://www.w3.org/2003/01/geo/wgs84_pos#> .
@prefix vcard: <http://www.w3.org/2006/vcard/ns#> .

mv:FillingStation
  a rdfs:Class , owl:Class ;
  rdfs:comment "Facility for combustion motor vehicles or electric motor vehicle." ;
  rdfs:label "filling station"@en .

mv:FuelStation
  rdfs:subClassOf mv:FillingStation ;
  rdfs:comment "Facility for refueling motor vehicle." ;
  rdfs:label "fuel station"@en, "Tankstelle"@de ;
  skos:altLabel "petrol station"@en, "gas station"@en-US. # property is used when synonyms, near-synonyms, or
abbrevia- tions need to be represented.

mv:ChargingStation
  rdfs:subClassOf mv:FillingStation ;
  rdfs:comment "Facility for electric motor vehicle." ;
  rdfs:label "charging station"@en, ""@de .

# Properties
```

Examples: RDFa - Microdata - RDF/XML - N3 - N-Triples - JSON-LD

Submit

Input  Output

# Vocabulary Syntax Testing

Output  
(rdf  
format):

```
<div xmlns="http://www.w3.org/1999/xhtml"
  prefix="
    owl: http://www.w3.org/2002/07/owl#
    rdf: http://www.w3.org/1999/02/22-rdf-syntax-ns#
    skos: http://www.w3.org/2004/02/skos/core#
    rdfs: http://www.w3.org/2000/01/rdf-schema#
    mv: http://eccenca.com/mobivoc/
    geo: http://www.w3.org/2003/01/geo/wgs84_pos#
    vcard: http://www.w3.org/2006/vcard/ns#"
>
<div typeof="rdf:Property" about="http://eccenca.com/mobivoc/fillingStationHeight">
  <div property="rdfs:comment" content="Indicates the height of the filling station. This is important especially for trucks">
  <div rel="rdfs:range" resource="http://www.w3.org/2000/01/rdf-schema#Literal"></div>
  <div rel="rdf:type" resource="http://www.w3.org/2002/07/owl#DatatypeProperty"></div>
  <div property="rdfs:label" xml:lang="en" content="filling station height"></div>
  <div rel="rdfs:domain" resource="http://eccenca.com/mobivoc/FillingStation"></div>
  <div property="rdfs:label" xml:lang="de" content=""></div>
</div>
```

## Error message:

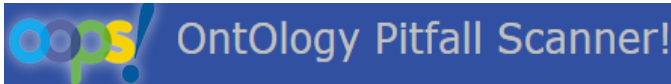
```
at line 51 of <>:
Bad syntax (expected '.', or ']' or ']' at end of statement) at ^ in:
"...dfs:label "E85"@en , "E85"@de ;

mv:Ethanol
  rdfs:subClassOf mv:Fuel;
  rdfs:comment "Liquid fuel used as motor fuel, ma..."
```

# Vocabulary Semantic Testing

## OOPS (Ontology Pitfall Scanner) tool:

- Detects some of the most common pitfalls appearing when developing ontologies



Input:

**OOPS! (Ontology Pitfall Scanner!)** helps you to detect some of the most common pitfalls appearing when developing ontologies.

To try it, enter a URI or paste an OWL document into the text field above. A list of pitfalls and the elements of your ontology where they appear will be displayed.

Scanner by URI:

Scanner by URI

Example: [http://data.semanticweb.org/ns/swc/swc\\_2009-05-09.rdf](http://data.semanticweb.org/ns/swc/swc_2009-05-09.rdf)

Scanner by direct input:

```
<?xml version="1.0" encoding="utf-8" ?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:skos="http://www.w3.org/2004/02/skos/core#"
  >
  <rdfs:Class rdf:about="http://eccenca.com/mobivoc/Fuel">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
    <rdfs:comment>Material to produce energy for motor vehicles.
  </rdfs:comment>
    <rdfs:label xml:lang="en">fuel</rdfs:label>
  </rdfs:Class>
</rdf:RDF>
```

Scanner by RDF

☒ Uncheck this checkbox if you don't want us to keep a copy of your ontology.

[Go to advanced evaluation](#)

# Vocabulary Semantic Testing

## Output/Evaluation Results:

E.g.

- Creating unconnected ontology elements
- Missing domain or range in properties

## Evaluation results

It is obvious that not all the pitfalls are equally important; their impact in the ontology will depend on multiple factors. For this reason, each pitfall has an importance level attached indicating how important it is. We have identified three levels:

- **Critical** 🚫 : It is crucial to correct the pitfall. Otherwise, it could affect the ontology consistency, reasoning, applicability, etc.
- **Important** ⚠️ : Though not critical for ontology function, it is important to correct this type of pitfall.
- **Minor** 🟡 : It is not really a problem, but by correcting it we will make the ontology nicer.

[Expand All] | [Collapse All]

### Results for P38: No OWL ontology declaration.

ontology\* | Important ⚠️

The owl:Ontology tag aims at gathering metadata about a given ontology as version information, creation date, etc. It is also used to declare the inclusion of other ontologies. Not declaring this tag is consider as a bad practice for owl ontologies as it is a symptom of not providing useful metadata as proposed in LDV2. An example of this pitfall (at 29th June, 2012) could be found at the "Creative Commons Rights Expression Language (cc)" ontology, which URI is <http://creativecommons.org/ns>, that does not have any owl:Ontology declaration in its RDF file even though there are other OWL elements used as, for example, owl:equivalentProperty.

\*This pitfall applies to the ontology in general instead of specific elements.

### Results for P39: Ambiguous namespace.

ontology\* | Critical 🚫

In the case of not having defined the ontology URI nor the xml:base namespace, the ontology namespace is matched to the file location. This situation is not desirable as the location of a file might change while the ontology should remain stable as proposed in LDV1. An example of this pitfall (at 29th June, 2012) could be found at the "Basic Access Control ontology (acl)" with URI <http://www.w3.org/ns/auth/acl> has no owl:Ontology tag nor xml:base def-initition.

\*This pitfall applies to the ontology in general instead of specific elements.

- Define relationships based on use cases and requirements
- Create test cases with SPARQL

- Testing Filling Station Location

```
"PREFIX mv: <http://eccenca.com/mobivoc/> " +
"PREFIX owl: <http://www.w3.org/2002/07/owl#> " +
"PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> " +
"PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> " +
"PREFIX skos: <http://www.w3.org/2004/02/skos/core#> " +
"PREFIX geo: <http://www.w3.org/2003/01/geo/wgs84_pos#> " +
"PREFIX vcard: <http://www.w3.org/2006/vcard/ns#> " +
"SELECT ?fsNumber ?cName ?locality ?pCode ?region ?sAddress " +
"WHERE { " +
"    ?fuelStation a mv:FuelStation . " +
"    ?fuelStation mv:fillingStationNumber ?fsNumber . " +
"    ?fuelStation vcard:hasAddress [ vcard:country-name ?cName ; " +
"                                   vcard:locality ?locality ; " +
"                                   vcard:postal-code ?pCode ; " +
"                                   vcard:region ?region ; " +
"                                   vcard:street-address ?sAddress ; ]. " +
"}";
```

**Output:**

ID: 4, Country: Germany, City: Bonn , PostCode: 53119 , Region: North Rhine-Westphalia , Street: Potsdamer Platz 7  
ID: 3, Country: Germany, City: Bonn , PostCode: 53119 , Region: North Rhine-Westphalia , Street: Lievelingsweg 10  
ID: 2, Country: Germany, City: Bonn , PostCode: 53225 , Region: North Rhine-Westphalia , Street: St. Augustiner Str. 145  
ID: 1, Country: Germany, City: Bonn , PostCode: 53117 , Region: North Rhine-Westphalia , Street: Kölnstraße 655



- Testing Geographical Coordinates

```
"PREFIX mv: <http://eccenca.com/mobivoc/> " +  
"PREFIX owl: <http://www.w3.org/2002/07/owl#> " +  
"PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> " +  
"PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> " +  
"PREFIX skos: <http://www.w3.org/2004/02/skos/core#> " +  
"PREFIX geo: <http://www.w3.org/2003/01/geo/wgs84_pos#> " +  
"PREFIX vcard: <http://www.w3.org/2006/vcard/ns#> " +  
"SELECT ?fsNumber ?longtitude ?latitude " +  
"WHERE { " +  
"    ?fuelStation a mv:FuelStation . " +  
"    ?fuelStation mv:fillingStationNumber ?fsNumber . " +  
"    ?fuelStation geo:long ?longtitude . " +  
"    ?fuelStation geo:lat ?latitude . " +  
"}";
```

Output:

```
ID: 4, Longitude: 7.077556, Latitude: 50.741982  
ID: 3, Longitude: 7.084079, Latitude: 50.745675  
ID: 2, Longitude: 7.122874, Latitude: 50.747196  
ID: 1, Longitude: 7.057300, Latitude: 50.761966
```

- Testing Contact Information

```
"PREFIX mv: <http://eccenca.com/mobivoc/> " +  
"PREFIX owl: <http://www.w3.org/2002/07/owl#> " +  
"PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> " +  
"PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> " +  
"PREFIX skos: <http://www.w3.org/2004/02/skos/core#> " +  
"PREFIX geo: <http://www.w3.org/2003/01/geo/wgs84_pos#> " +  
"PREFIX vcard: <http://www.w3.org/2006/vcard/ns#> " +  
"SELECT ?fsNumber ?tel ?url " +  
"WHERE { " +  
"    ?fuelStation a mv:FuelStation . " +  
"    ?fuelStation mv:fillingStationNumber ?fsNumber . " +  
"    ?fuelStation vcard:tel ?tel . " +  
"    ?fuelStation vcard:url ?url . " +  
"}";
```

Output:

```
ID: 4, Tel: 0228 654851, URL: svg-nordrhein.de  
ID: 3, Tel: 0228 676991, URL: essofuelfinder.com  
ID: 2, Tel: 0228 476790, URL: essofuelfinder.com  
ID: 1, Tel: 0228 673966, URL: shell.de
```