

Semantic Validation of the 10 SPARQL Rules

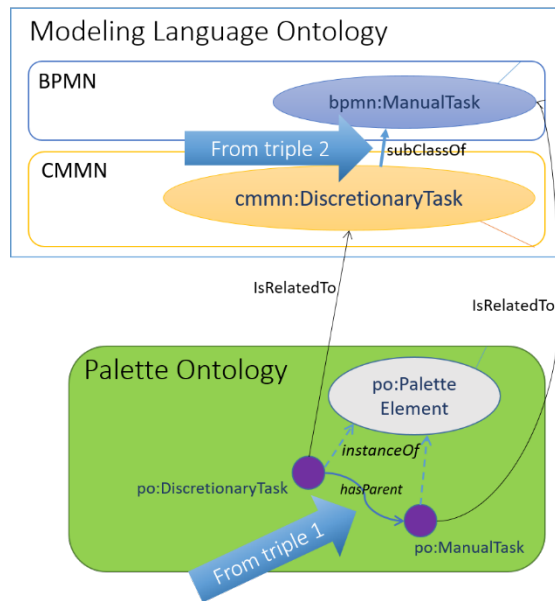
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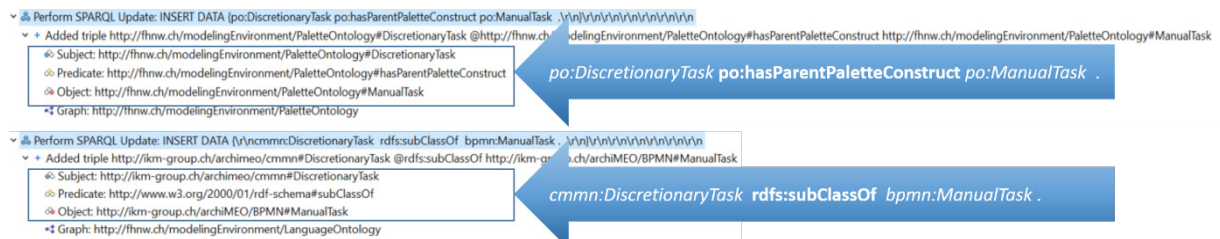
1. Introduction

This document contains all the screenshots taken while firing the SPARQL rule instances against the ontology for DSML4PTM. The execution of the queries was performed in TobBraid. The screenshots prove that the expected results was met. Therefore, all the 10 SPARQL rules proves to be semantically correct.

2. Instance of SPARQL Rule 1 - Modelling Elements Integration

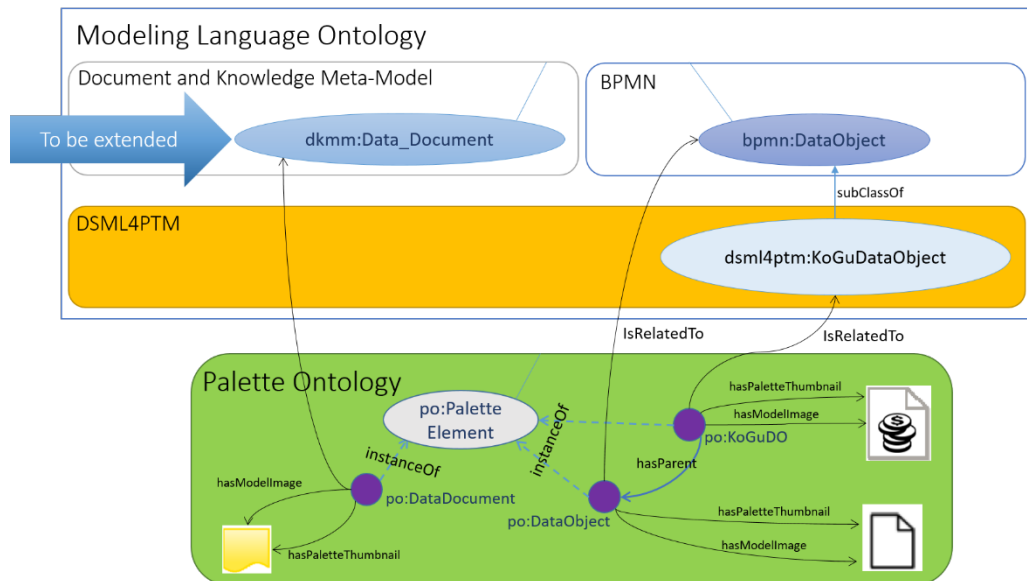


The below screenshot shows the result of the instance of SPARQL Rule 1. The rule instance integrates the CMMN Discretionary Task and the BPMN Manual Task as expected from the conceptualization. Namely, two triples in the form of *subject-predicate-object* (see the four arrows in the figure) are created. The first triple is entered in the Palette Ontology whereas the second one in the Modelling Language Ontology. This shows that the rule instance successfully inserts the wanted resources in the ontology-based meta-model. Hence, SPARQL Rule 1 is semantically validated.

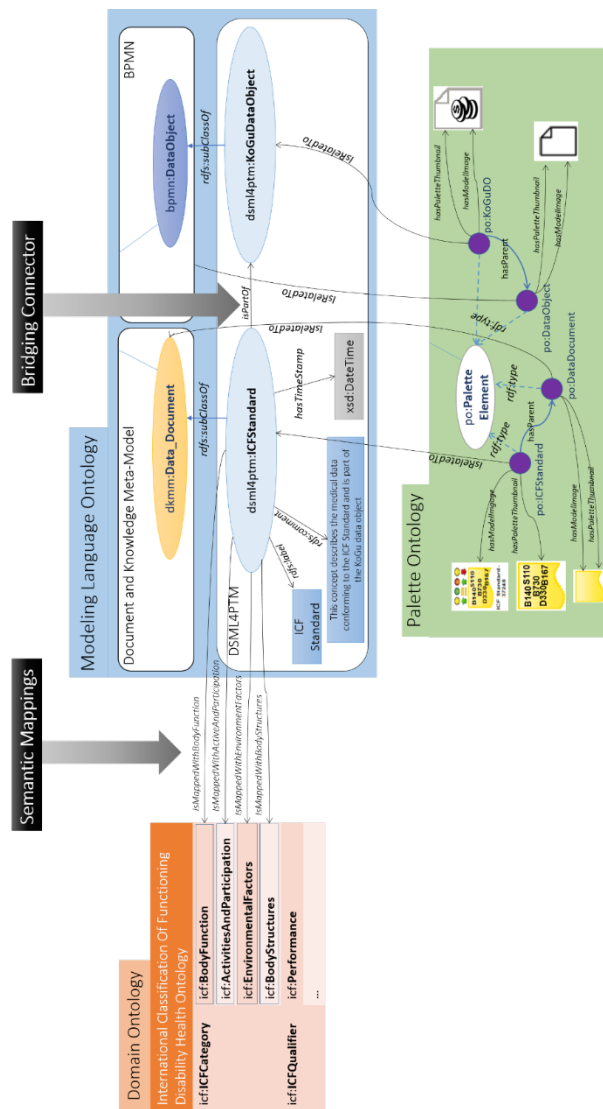


3. Instances of SPARQL rules 2 to 5 for “Modeling Language Extension with a new Modeling Element”

The below figure shows the conceptualization of the use case before firing instances of queries from 2 to 5.



The below figure shows the conceptualization of the use case after firing the instances of SPARQL queries from 2 to 5.



3.1 Instance of SPARQL Rule 2 (first part) and Rule 4

The below screenshot shows the results for the execution of the instances of SPARQL Rule 2 - create modelling construct and SPARQL Rule 4 – create datatypes. The rule instance extends the modelling construct “Data_Document” of the Document and Knowledge Meta-Model. As expected, the result contains the new sub-class, its label, comment, and date time property (i.e.,

[illegible]

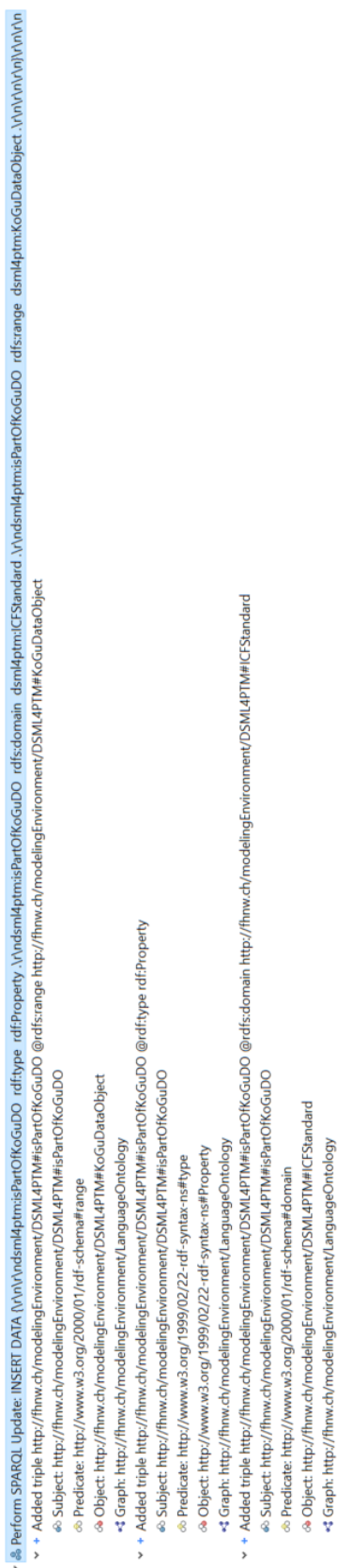
3.2 Instance of SPARQL Rule 2 (second part)

The below screenshot shows the creation of the new instance, label and association of the new instance to the related class, to the parent instance, and to the two graphical notations. Thus, also the the second part of the SPARQL Rule 2 is semantically correct.

```
Perform SPARQL Update: INSERT DATA ( \V\po:ICFStandard rdf:type po:PaletteElement \V\po:ICFStandard rdfs:label "ICF Standard - instance for graphical notation" \V\po:ICFStandard po:isRelatedToModelingConstruct dsm4ptm:ICFStandard \V\po:ICFStandard
+ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @d:label "ICF Standard - instance for graphical notation"
  Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
  Predicate: http://www.w3.org/2000/01/rdf-schema#label
  Object: "ICF Standard - instance for graphical notation"
+ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
+ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#isRelatedToModelingConstruct http://fhww.ch/modelingEnvironment/DSML4PTM#ICFStandard
  Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
  Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#isRelatedToModelingConstruct
  Object: http://fhww.ch/modelingEnvironment/DSML4PTM#ICFStandard
+ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
+ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#hasModelThumbnail "gn:ICFStandardForCanvas.png"
  Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
  Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#hasModelThumbnail
  Object: "gn:ICFStandardForCanvas.png"
+ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
+ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @rdf:type http://fhww.ch/modelingEnvironment/PaletteOntology#PaletteElement
  Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
  Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type
  Object: http://fhww.ch/modelingEnvironment/PaletteOntology#PaletteElement
+ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
+ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#hasPaletteThumbnail "gn:ICFStandardForPalette.png"
  Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
  Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#hasPaletteThumbnail
  Object: "gn:ICFStandardForPalette.png"
+ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
+ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#hasParentPaletteConstruct http://fhww.ch/modelingEnvironment/PaletteOntology#DataDocument
  Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
  Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#hasParentPaletteConstruct
  Object: http://fhww.ch/modelingEnvironment/PaletteOntology#DataDocument
+ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
```

3.3 Instance of SPARQL Rule 3 (first part)

The below screenshot shows the creation of the new object property “*isPartOf*” (bridging connector). The result validates the semantic correctness of the first part of SPARQL Rule 3.



3.3.1 Instance of SPARQL Rule 3 (second part)

The two below screenshots show the creation of the new object properties for the mapping with domain ontology concepts (semantic mappings). Therefore, the second part of SPARQL Rule 3 is semantically correct.

```
-- Perform SPARQL Update: INSERT DATA {  
    -- Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction rdf:type rdfs:domain dsml4ptm:CFSStandard  
    @rdfs:range http://who.int/icf#BodyStructures  
  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyStructures  
        :Object http://who.int/icf#BodyStructures  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyStructures @rdfs:domain http://fhww.ch/modellingEnvironment/DSML4PTM#CFSStandard  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyStructures  
        :Predicate http://www.w3.org/2000/01/rdf-schema#domain  
        :Object http://www.w3.org/2000/01/rdf-schema#range  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction @rdfs:range http://who.int/icf#BodyFunction  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction  
        :Predicate http://www.w3.org/2000/01/rdf-schema#range  
        :Object http://who.int/icf#BodyFunction  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyStructures @rdf:type rdfs:Property  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyStructures  
        :Predicate http://www.w3.org/1999/02/22-rdf-syntax-ns#type  
        :Object http://www.w3.org/1999/02/22-rdf-syntax-ns#Property  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction @rdf:type rdfs:Property  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction  
        :Predicate http://www.w3.org/1999/02/22-rdf-syntax-ns#type  
        :Object http://www.w3.org/1999/02/22-rdf-syntax-ns#Property  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithEnvironmentalFactors @rdf:type rdfs:Property  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithEnvironmentalFactors  
        :Predicate http://www.w3.org/1999/02/22-rdf-syntax-ns#type  
        :Object http://www.w3.org/1999/02/22-rdf-syntax-ns#Property  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation @rdfs:range http://who.int/icf#EnvironmentalFactors  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation  
        :Predicate http://www.w3.org/2000/01/rdf-schema#range  
        :Object http://who.int/icf#EnvironmentalFactors  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction @rdfs:domain http://fhww.ch/modellingEnvironment/DSML4PTM#CFSStandard  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithBodyFunction  
        :Predicate http://www.w3.org/2000/01/rdf-schema#domain  
        :Object http://www.w3.org/2000/01/rdf-schema#range  
  
    ?Graph http://fhww.ch/modellingEnvironment/LanguageOntology  
    + Added triple http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithEnvironmentalFactors @rdfs:domain http://fhww.ch/modellingEnvironment/DSML4PTM#CFSStandard  
    ?Subject http://fhww.ch/modellingEnvironment/DSML4PTM#isMappedWithEnvironmentalFactors  
        :Predicate http://www.w3.org/2000/01/rdf-schema#domain  
        :Object http://fhww.ch/modellingEnvironment/DSML4PTM#CFSStandard  
}
```


- ▼ + Added triple <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance> @rdfs:range <http://who.int/icf#Performance>
 - 🔗 Subject: <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance>
 - 🔗 Predicate: <http://www.w3.org/2000/01/rdf-schema#range>
 - 🔗 Object: <http://who.int/icf#Performance>
 - ➡ Graph: <http://fhnw.ch/modelingEnvironment/LanguageOntology>
- ▼ + Added triple <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance> @rdf:type <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance>
 - 🔗 Subject: <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance>
 - 🔗 Predicate: <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
 - 🔗 Object: <http://www.w3.org/1999/02/22-rdf-syntax-ns#Property>
 - ➡ Graph: <http://fhnw.ch/modelingEnvironment/LanguageOntology>
- ▼ + Added triple <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation> @rdfs:range <http://who.int/icf#ActivitiesAndParticipation>
 - 🔗 Subject: <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation>
 - 🔗 Predicate: <http://www.w3.org/2000/01/rdf-schema#range>
 - 🔗 Object: <http://who.int/icf#ActivitiesAndParticipation>
 - ➡ Graph: <http://fhnw.ch/modelingEnvironment/LanguageOntology>
- ▼ + Added triple <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance> @rdfs:domain <http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard>
 - 🔗 Subject: <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithPerformance>
 - 🔗 Predicate: <http://www.w3.org/2000/01/rdf-schema#domain>
 - 🔗 Object: <http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard>
 - ➡ Graph: <http://fhnw.ch/modelingEnvironment/LanguageOntology>
- ▼ + Added triple <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation> @rdf:type <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation>
 - 🔗 Subject: <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation>
 - 🔗 Predicate: <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
 - 🔗 Object: <http://www.w3.org/1999/02/22-rdf-syntax-ns#Property>
 - ➡ Graph: <http://fhnw.ch/modelingEnvironment/LanguageOntology>
- ▼ + Added triple <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation> @rdfs:domain <http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard>
 - 🔗 Subject: <http://fhnw.ch/modelingEnvironment/DSML4PTM#isMappedWithActivityAndParticipation>
 - 🔗 Predicate: <http://www.w3.org/2000/01/rdf-schema#domain>
 - 🔗 Object: <http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard>
 - ➡ Graph: <http://fhnw.ch/modelingEnvironment/LanguageOntology>

3.3.2 Instance of SPARQL Rule 5

The below screenshot shows the creation of the domain concept “ICFQualifier”. Therefore, the SPARQL Rules 5 is semantically correct.

```
▼ Perform SPARQL Update: INSERT DATA { \n icf:Performance rdf:type rdfs:Class . \n icf:Performance rdfs:label "ICF Qualifier Performance" . \n icf:Performance rdfs:subClassOf icf:ICFQualifier . \n } \n
  ▼ + Added triple http://who.int/icf#Performance @rdf:type rdfs:Class
    ⚙ Subject: http://who.int/icf#Performance
    ⚙ Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type
    ⚙ Object: http://www.w3.org/2000/01/rdf-schema#Class
    ➦ Graph: http://who.int/icf
  ▼ + Added triple http://who.int/icf#Performance @rdfs:label "ICF Qualifier Performance"
    ⚙ Subject: http://who.int/icf#Performance
    ⚙ Predicate: http://www.w3.org/2000/01/rdf-schema#label
    ⚙ Object: "ICF Qualifier Performance"
    ➦ Graph: http://who.int/icf
  ▼ + Added triple http://who.int/icf#Performance @rdfs:subClassOf http://who.int/icf#ICFQualifier
    ⚙ Subject: http://who.int/icf#Performance
    ⚙ Predicate: http://www.w3.org/2000/01/rdf-schema#subClassOf
    ⚙ Object: http://who.int/icf#ICFQualifier
    ➦ Graph: http://who.int/icf
```

4. Instances of SPARQL Rules 6 and 7 for “Delete a Resource”

In order to validate the semantic correctness of SPARQL Rule 6 and 7 the use case proposed in section 2 is considered.

The instance of SPARQL rule 6 aims to delete the class “*dsml4ptm:ICFStandard*” and its property-value pairs from the Modeling Language Ontology as well as the related instances in the Palette Ontology. The instance of SPARQL rule 7 aims to delete the object property “*dsml4ptm:isPartOfKoGuDO*” also from the Modeling Language Ontology.

4.1 Validation of the specific SPARQL Rule 6 for deleting the class “*dsml4ptm:ICFStandard*”

The below screenshot shows the results of the execution of the instance of SPARQL Rule 6. The rule instance deletes the class “*dsml4ptm:ICFStandard*” and its property-value pairs from the Modelling Language Ontology. In particular, the *rdf* and *rdfs* properties were removed such as *rdfs:comment*, *rdfs:subClassOf*, *rdf:type*, *rdfs:label*. Since the rule instance produces the expected outcome, the semantic validation for SPARQL Rule 6 is successfully carried out.

Delete modelling construct:

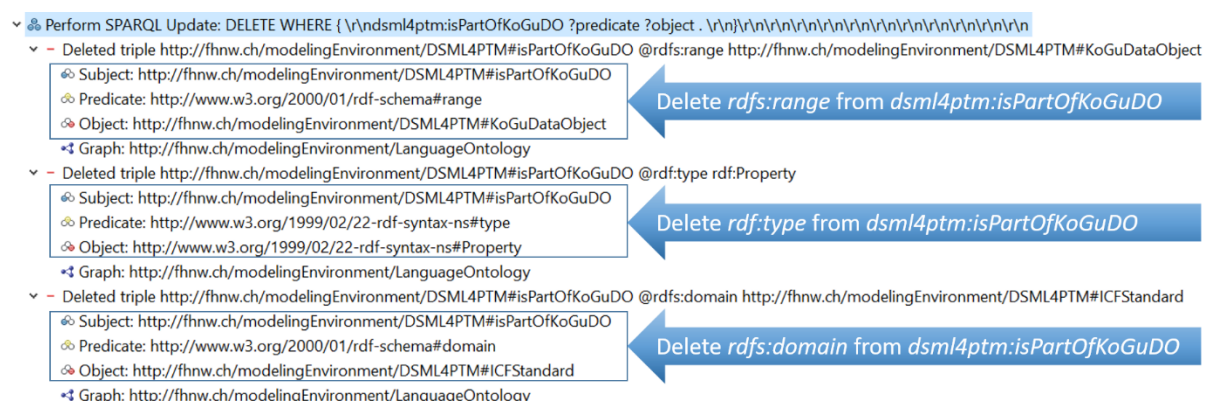
```
▼ Perform SPARQL Update: DELETE WHERE { \n dsml4ptm:ICFStandard ?predicate ?object . \n } \n
  ▼ - Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard @rdfs:comment "This concept described..."
    ⚙ Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard
    ⚙ Predicate: http://www.w3.org/2000/01/rdf-schema#comment
    ⚙ Object: "This concept described..."
    ➦ Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
  ▼ - Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard @rdfs:subClassOf http://fhnw.ch/modelingEnvironment/dkmm#Data_Document
    ⚙ Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard
    ⚙ Predicate: http://www.w3.org/2000/01/rdf-schema#subClassOf
    ⚙ Object: http://fhnw.ch/modelingEnvironment/dkmm#Data_Document
    ➦ Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
  ▼ - Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard @rdf:type rdfs:Class
    ⚙ Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard
    ⚙ Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type
    ⚙ Object: http://www.w3.org/2000/01/rdf-schema#Class
    ➦ Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
  ▼ - Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard @rdfs:label "ICF Standard"
    ⚙ Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandard
    ⚙ Predicate: http://www.w3.org/2000/01/rdf-schema#label
    ⚙ Object: "ICF Standard"
    ➦ Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
```

Delete *rdfs:comment* from *dsml4ptm:ICFStandard*

Delete *rdfs:subClassOf* from *dsml4ptm:ICFStandard*

Delete *rdf:type* from *dsml4ptm:ICFStandard*

Delete *rdfs:label* from *dsml4ptm:ICFStandard*



5. Instances of SPARQL Rules 8 to 11 for “Update a Resource”

In order to validate the semantic correctness of SPARQL Rule 6 and 7 the use case proposed in section 2 is considered.

5.1 Instance of SPARQL Rule 8

The two below screenshots presents the results of the delete and insert statements to update label, comment of the modelling construct *dsml4ptm:ICFStandard* as well as label, thumbnail and model image of the related instance *po:ICFStandard*. Results from the Delete statement:



Results from the insert statement:

```

❖ Perform SPARQL Update: INSERT DATA { \Vndsm4ptm:ICFStandard rdf:type "ICF International Standard". \Vndsm4ptm:ICFStandard rdfs:comment "The ICF Standard describes..." . \Vndsm4ptm:ICFStandard rdfs:label "ICF International Standard" . }
❖ Added triple http://fhww.ch/modelingEnvironment/DSML4PTM#ICFStandard @rdfs:label "ICF International Standard"
❖ Subject: http://fhww.ch/modelingEnvironment/DSML4PTM#ICFStandard
❖ Predicate: http://www.w3.org/2000/01/rdf-schema#label
❖ Object: "ICF International Standard"
❖ Graph: http://fhww.ch/modelingEnvironment/LanguageOntology
❖ Added triple http://fhww.ch/modelingEnvironment/DSML4PTM#ICFStandard @rdfs:comment "The ICF Standard describes..."
❖ Subject: http://fhww.ch/modelingEnvironment/DSML4PTM#ICFStandard
❖ Predicate: http://www.w3.org/2000/01/rdf-schema#comment
❖ Object: "The ICF Standard describes..."
❖ Graph: http://fhww.ch/modelingEnvironment/LanguageOntology
❖ Perform SPARQL Update: INSERT DATA { \Vnpol:ICFStandard rdfs:label "ICF International Standard". \Vnpol:ICFStandard po:hasPaletteThumbnail "NewICFStandardForPalette.png". \Vnpol:ICFStandard po:hasModelImage "NewICFStandardForModel". \Vnpol:ICFStandard po:hasModelImage "NewICFStandardForModel" . }
❖ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#hasThumbnail "NewICFStandardForPalette.png"
❖ Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
❖ Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#hasThumbnail
❖ Object: "NewICFStandardForModel"
❖ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
❖ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#hasThumbnail "NewICFStandardForPalette.png"
❖ Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
❖ Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#hasThumbnail
❖ Object: "NewICFStandardForModel"
❖ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology
❖ Added triple http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard @http://fhww.ch/modelingEnvironment/PaletteOntology#hasThumbnail "NewICFStandardForPalette.png"
❖ Subject: http://fhww.ch/modelingEnvironment/PaletteOntology#ICFStandard
❖ Predicate: http://fhww.ch/modelingEnvironment/PaletteOntology#hasThumbnail
❖ Object: "NewICFStandardForPalette.png"
❖ Graph: http://fhww.ch/modelingEnvironment/PaletteOntology

```

5.2 Instance of SPARQL Rule 9

The below two screenshots show the update of *label* and *range* of the object property “*dsml4ptm:isPartOf*”. Thus SPARQL 9 is semantically correct.

Results from the delete statement:

```
Perform SPARQL Update: DELETE DATA { \ndsml4ptm:isPartOfKoGuDO rdfs:label "ICF Standard is part of KoGu Data Object" . \ndsml4ptm:isPartOfKoGuDO rdfs:range dsml4ptm:KoGuDataObject . \n
- Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO @rdfs:range http://fhnw.ch/modelingEnvironment/DSML4PTM#KoGuDataObject
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO
  Predicate: http://www.w3.org/2000/01/rdf-schema#range
  Object: http://fhnw.ch/modelingEnvironment/DSML4PTM#KoGuDataObject
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
- Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO @rdfs:label "ICF Standard is part of KoGu Data Object"
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO
  Predicate: http://www.w3.org/2000/01/rdf-schema#label
  Object: "ICF Standard is part of KoGu Data Object"
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
```

Results from the Insert statement:

```
Perform SPARQL Update: INSERT DATA { \ndsml4ptm:isPartOfKoGuDO rdfs:label "ICF Standard is part of Data Object" . \ndsml4ptm:isPartOfKoGuDO rdfs:range bpmn:DataObject . \n
+ Added triple http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO @rdfs:range http://ikm-group.ch/archiMEO/BPMN#DataObject
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO
  Predicate: http://www.w3.org/2000/01/rdf-schema#range
  Object: http://ikm-group.ch/archiMEO/BPMN#DataObject
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
+ Added triple http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO @rdfs:label "ICF Standard is part of Data Object"
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#isPartOfKoGuDO
  Predicate: http://www.w3.org/2000/01/rdf-schema#label
  Object: "ICF Standard is part of Data Object"
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
```

5.3 Instance of SPARQL Rule 10

The below two screenshots show the update of *label* and *range* of the datatype property “*dsml4ptm:hasTimeStamp*”. Thus SPARQL 10 is semantically correct.

Results from the delete statement:

```
Perform SPARQL Update: DELETE DATA { \ndsml4ptm:ICFStandardHasTimeStamp rdfs:label "ICF Standard is assigned at" . \ndsml4ptm:ICFStandardHasTimeStamp rdfs:range xsd:dateTime . \n
- Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp @rdfs:label "ICF Standard is assigned at"
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp
  Predicate: http://www.w3.org/2000/01/rdf-schema#label
  Object: "ICF Standard is assigned at"
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
- Deleted triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp @rdfs:range xsd:dateTime
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp
  Predicate: http://www.w3.org/2000/01/rdf-schema#range
  Object: http://www.w3.org/2001/XMLSchema#dateTime
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
```

Results from the insert statement:

```
Perform SPARQL Update: INSERT DATA { \ndsml4ptm:ICFStandardHasTimeStamp rdfs:label "ICF Standard has default TimeStamp" . \ndsml4ptm:ICFStandardHasTimeStamp rdfs:range "2019-02-04T13:20:00"^^xsd:dateTime . \n
+ Added triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp @rdfs:range "2019-02-04T13:20:00"^^http://www.w3.org/2001/XMLSchema#dateTime
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp
  Predicate: http://www.w3.org/2000/01/rdf-schema#range
  Object: "2019-02-04T13:20:00"^^http://www.w3.org/2001/XMLSchema#dateTime
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
+ Added triple http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp @rdfs:label "ICF Standard has default TimeStamp"
  Subject: http://fhnw.ch/modelingEnvironment/DSML4PTM#ICFStandardHasTimeStamp
  Predicate: http://www.w3.org/2000/01/rdf-schema#label
  Object: "ICF Standard has default TimeStamp"
  Graph: http://fhnw.ch/modelingEnvironment/LanguageOntology
```