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# Knowledge Graph Construction 2020



## Small Extensions to Consider for R2RML

for possible use in panel discussion:

## Retrospectives from the RDB2RDF WG



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Oct 12, 2020

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## Architect at Oracle

- RDF Knowledge Graph
- Property Graph

## Education

- Ph.D., Rutgers University
- M.S., Vanderbilt University
- B.Tech., Indian Institute of Technology (IIT), Kharagpur

## Standards Activity

- W3C RDB2RDF, Editor of R2RML
- W3C SPARQL 1.0 and 1.1
- W3C RDF 1.1

## Publications in SW and Database Area

- ICDE, EDBT, VLDB, CIKM
- Patents in Database and Graph technologies



# R2RML: RDB to RDF Mapping Language

W3C Recommendation 27 September 2012

**This version:**

<http://www.w3.org/TR/2012/REC-r2rml-20120927/>

**Latest version:**

<http://www.w3.org/TR/r2rml/>

**Previous version:**

<http://www.w3.org/TR/2012/PR-r2rml-20120814/>

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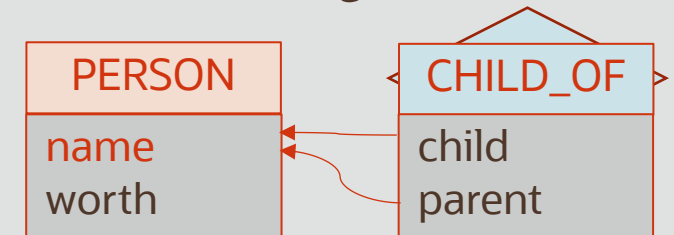
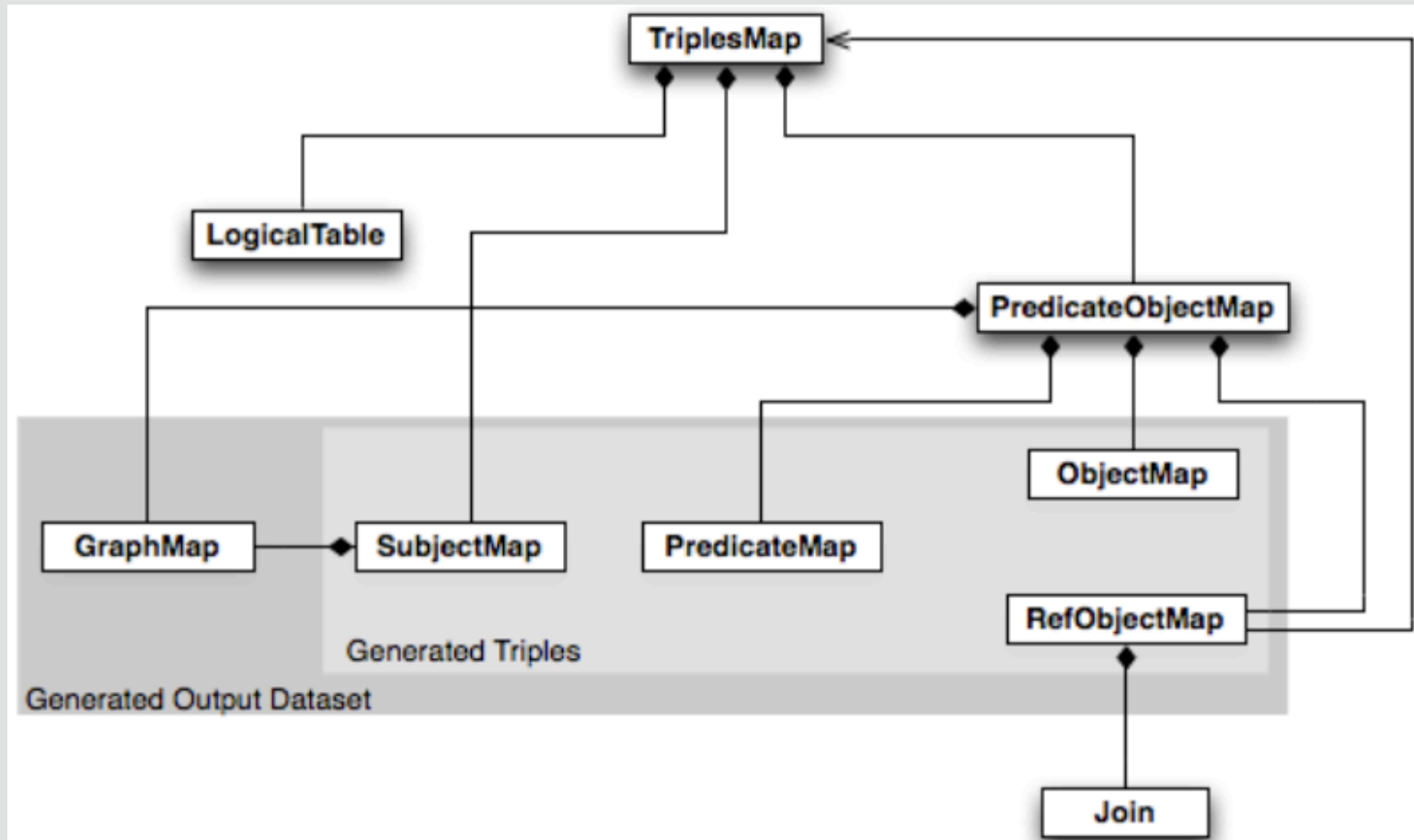
Please refer to the [errata](#) for this document, which may include some normative corrections.

See also [translations](#).

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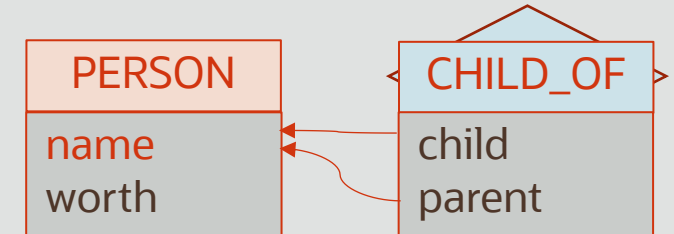
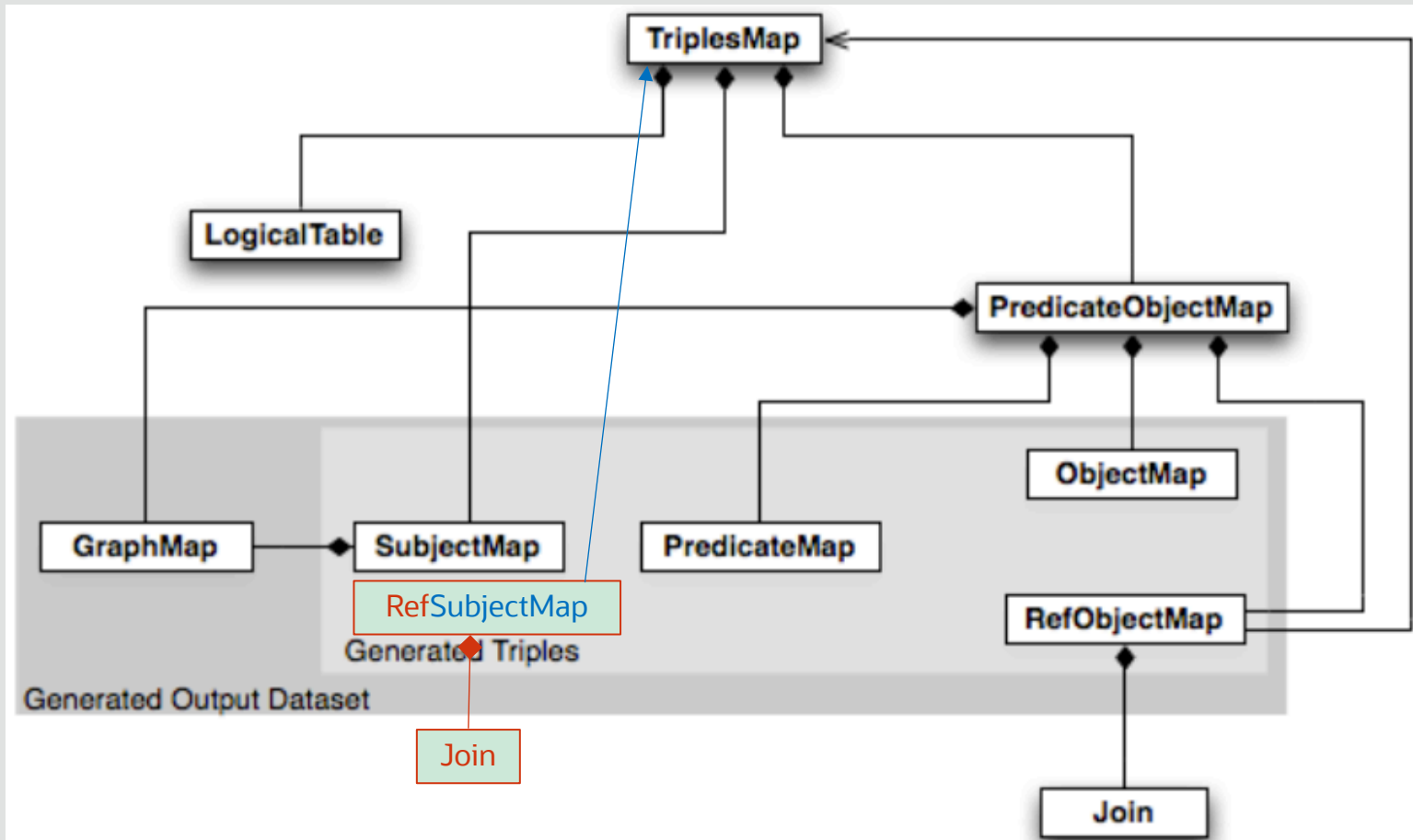
# Today: ParentTriplesMap only in RefObjectMap



```
# -- PERSON table --
# Resource (VERTEX) and its Properties
ex:TMap_PERSON a rr:TriplesMap ;
rr:logicalTable ... "PERSON" ... ;
rr:subjectMap ... "http://P/{name}"
rr:predicateObjectMap ... .
```

```
# -- CHILD_OF (relationship) table --
# EDGE → (child)-[childOf]->(parent)
ex:TMap_CHILD_OF a rr:TriplesMap ;
rr:logicalTable ... "CHILD OF" ... ;
rr:subjectMap ... "http://P/{child}"
rr:predicateObjectMap ... [
  rr:predicate ... ;
  rr:objectMap ... → ex:TMap_PERSON
  • parent = name
];
```

# RefSubjectMap: → TriplesMap

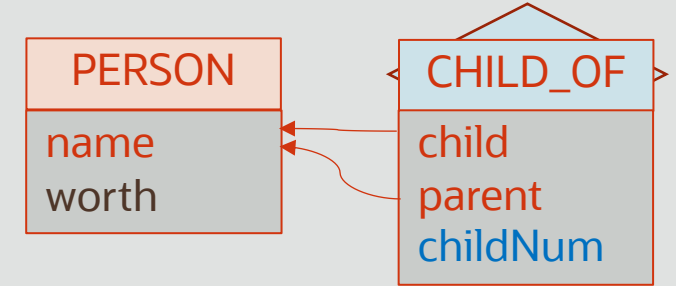
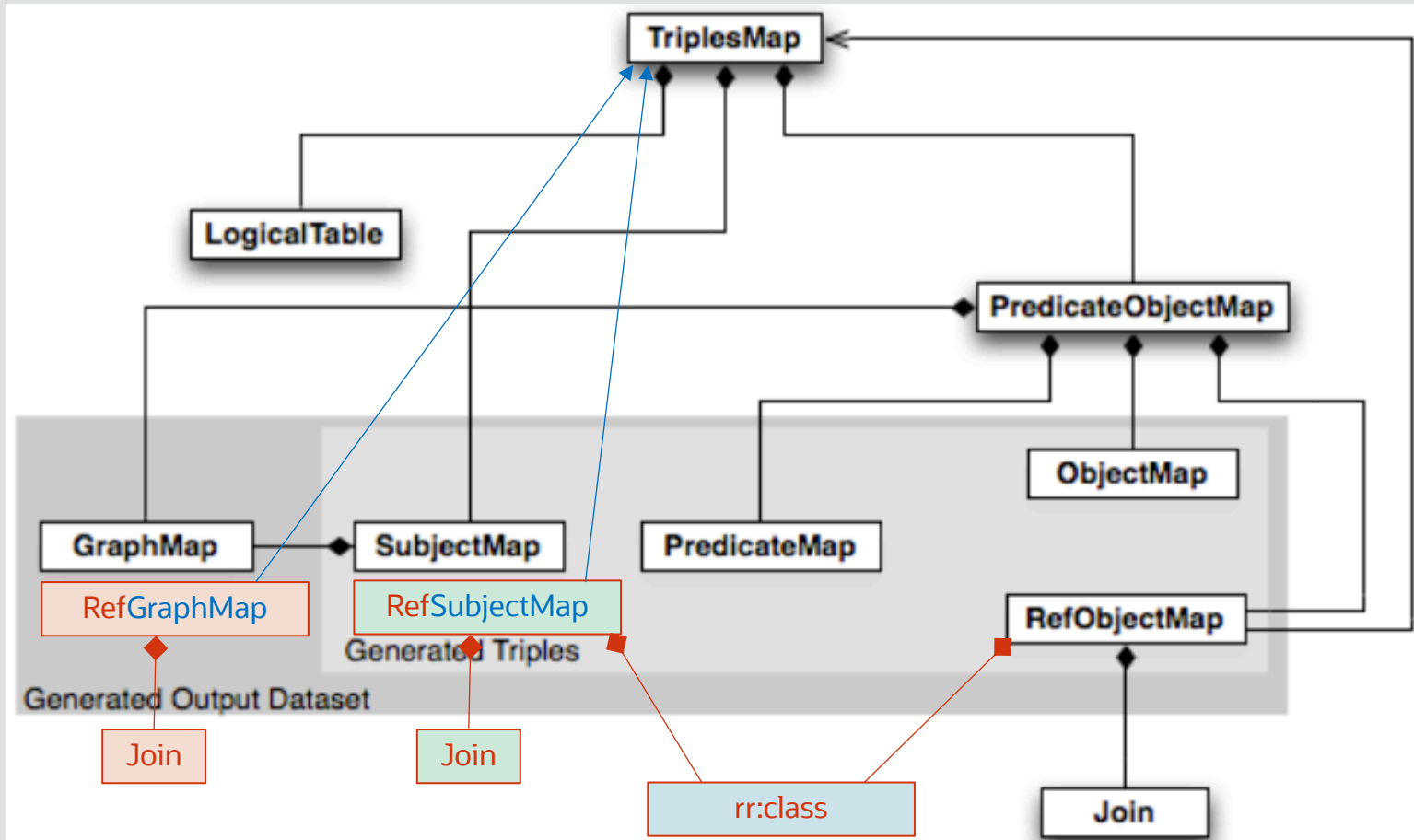


```
# -- PERSON table --
# Resource (VERTEX) and its Properties
ex:TMap_PERSON a rr:TriplesMap ;
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```

```
# -- CHILD_OF (relationship) table --
# EDGE → (child)-[childOf]->(parent)
ex:TMap_CHILD_OF a rr:TriplesMap ;
rr:logicalTable ... "CHILD OF" ... ;
rr:subjectMap ... → ex:TMap_PERSON
rr:predicateObjectMap ... • child = name
rr:predicate ... ;
rr:objectMap ... → ex:TMap_PERSON
• parent = name
];
```



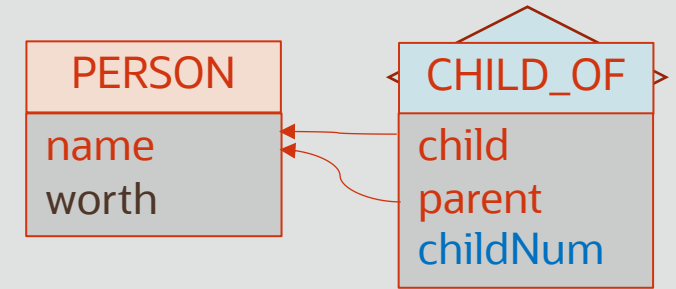
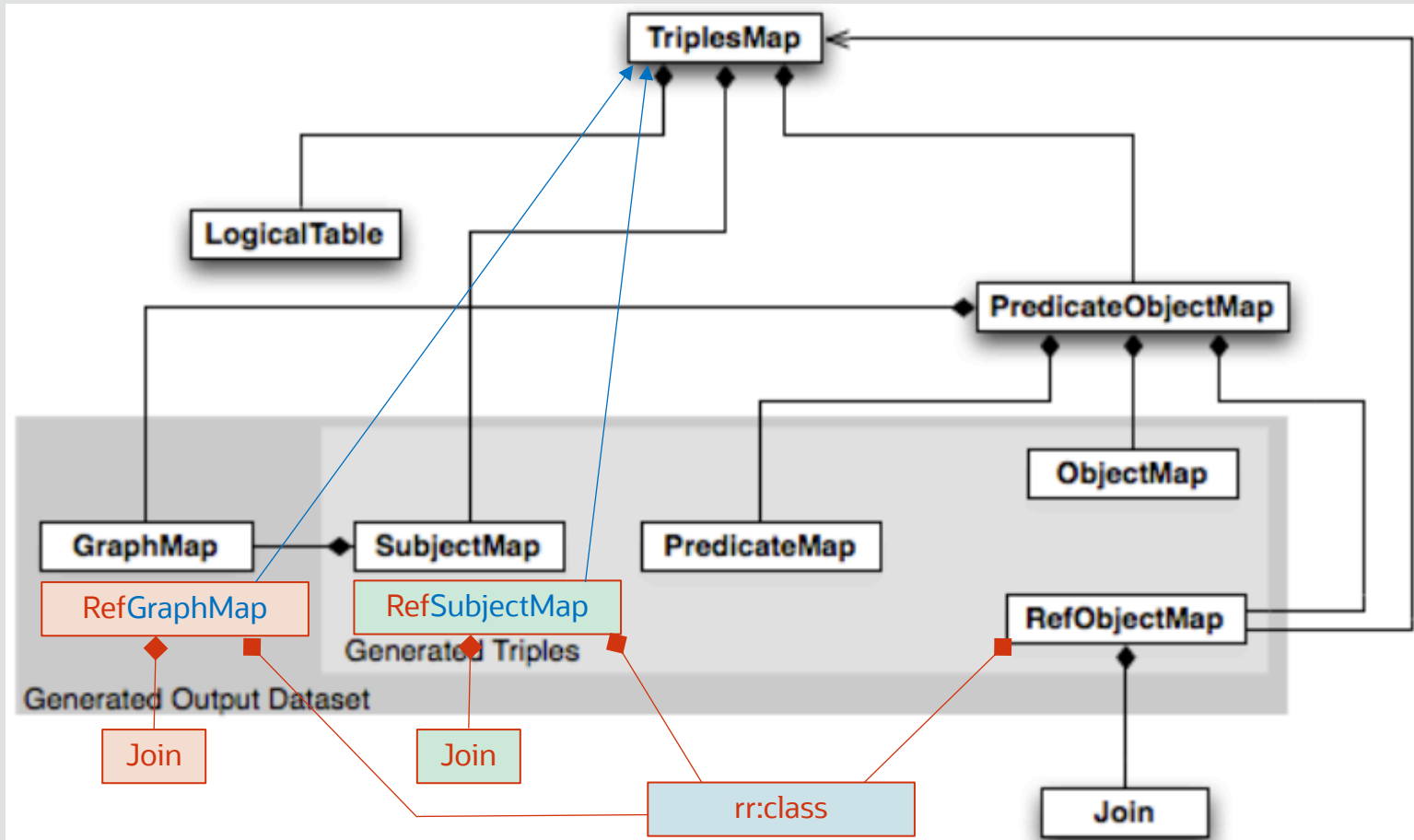
# RefGraphMap: → TriplesMap



```
# -- CHILD_OF (entity) table --
# (EDGE as) Resource and its Properties
ex:TMap_chOf_entity a rr:TriplesMap ;
rr:logicalTable ... "CHILD_OF" ... ;
rr:subjectMap ... "http://COF/{child}#{parent}"
rr:predicateObjectMap ... [
  rr:predicate ex:seqnum ;
  rr:objectMap [ rr:column "childNum" ] ]
```

```
# -- CHILD_OF (relationship) table --
# EDGE → (child)-[childOf]->(parent)
ex:TMap_CHILD_OF a rr:TriplesMap ;
rr:logicalTable ... "CHILD_OF" ... ;
rr:subjectMap ... ;
rr:predicateObjectMap ... [
  rr:graphMap ... → ex:TMap_PERSON
  rr:predicate ... ;
  • child = child
  • parent = parent
];
```

# rr:class for RefGraphMap



```
# -- CHILD_OF (entity) table --
# (EDGE as) Resource and its Properties
ex:TMap_chOf_entity a rr:TriplesMap ;
rr:logicalTable ... "CHILD_OF" ... ;
rr:subjectMap ... "http://COF/{child}#{parent}"
rr:predicateObjectMap ... [
  rr:predicate ex:seqnum ;
  rr:objectMap [ rr:column "childNum" ] ]
```

```
# -- CHILD_OF (relationship) table --
# EDGE -> (child)-[childOf]->(parent)
ex:TMap_CHILD_OF a rr:TriplesMap ;
rr:logicalTable ... "CHILD_OF" ... ;
rr:subjectMap ... ;
rr:predicateObjectMap ... [
  rr:graphMap . -> ex:TMap_PERSON
  rr:predicate ...
  • rr:class
  ex:Triple_chOf
];
```





# Summary of Suggested Extensions

## RefSubjectMap

- Like ObjectMap, allow SubjectMap too to contain a ParentTriplesMap
  - Models the foreign key constraints in a Relationship table
  - It will avoid having to repeat the SubjectMap template from ParentTriplesMap

## rr:class for RefObjectMap too

- Categorize the subjects (generated by the ParentTriplesMap) that are used as object in a relationship

## RefGraphMap

- Allow GraphMap too to contain a ParentTriplesMap
  - Models RDF's capability to describe the resource (e.g., group of triples, possibly singleton) represented by a named graph
  - It will avoid having to repeat in a GraphMap the SubjectMap template from ParentTriplesMap

## rr:class for RefGraphMap

- Categorize the subjects (generated by the ParentTriplesMap) that are used as named graph



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