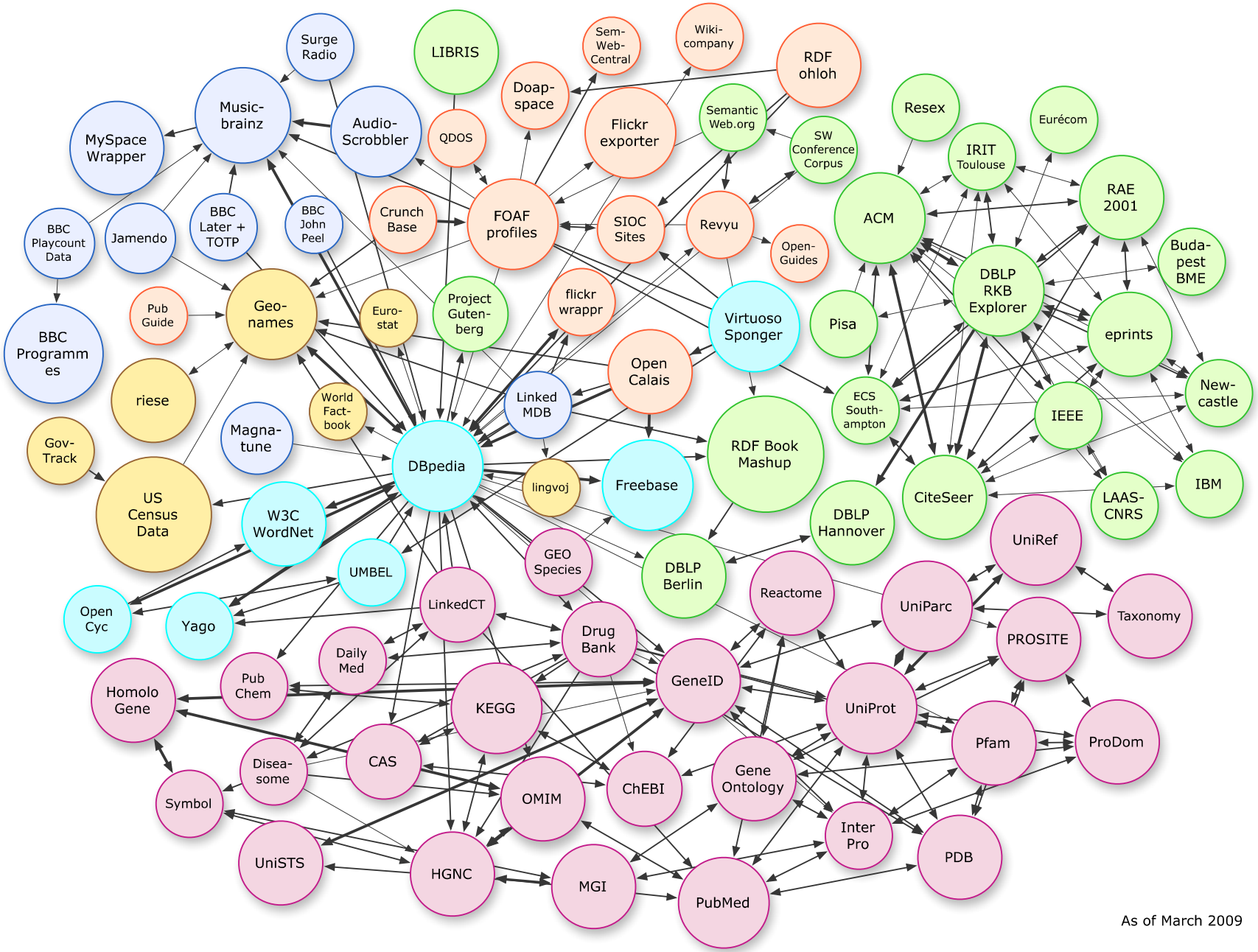
Recording context in RDF

Problems, possibilities, patterns

With examples drawn from musical performance and historical place descriptions

Graham Klyne
email: gklyne@gmail.com
twitter, skype, github: @gklyne

Background - 2009



As of March 2009

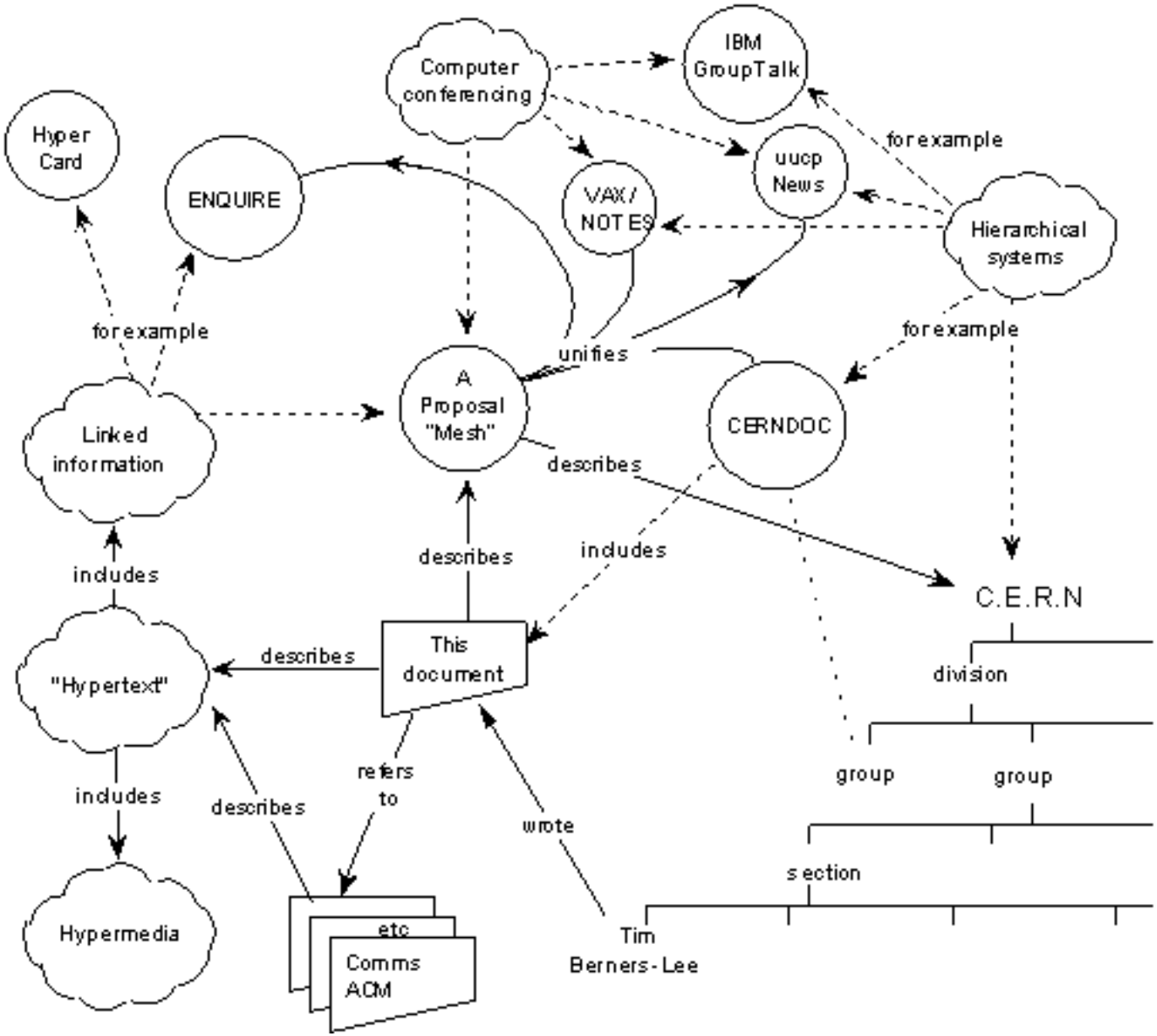
Background - 2018

Legend

- Cross Domain
- Geography
- Government
- Life Sciences
- Linguistics
- Media
- Publications
- Social Networking
- User Generated

https://lod-cloud.net/versions/2018-30-05/lod-cloud.svg

The RDF model is simple – too simple?



http://www.w3.org/History/1989/proposal.html (Tim Berners-Lee)

But first - a note about terminology

Ontology

- **not** what is usually meant by philosophers
- an “explicit specification of a conceptualization”
- http://tomgruber.org/writing/ontology-definition-2007.htm

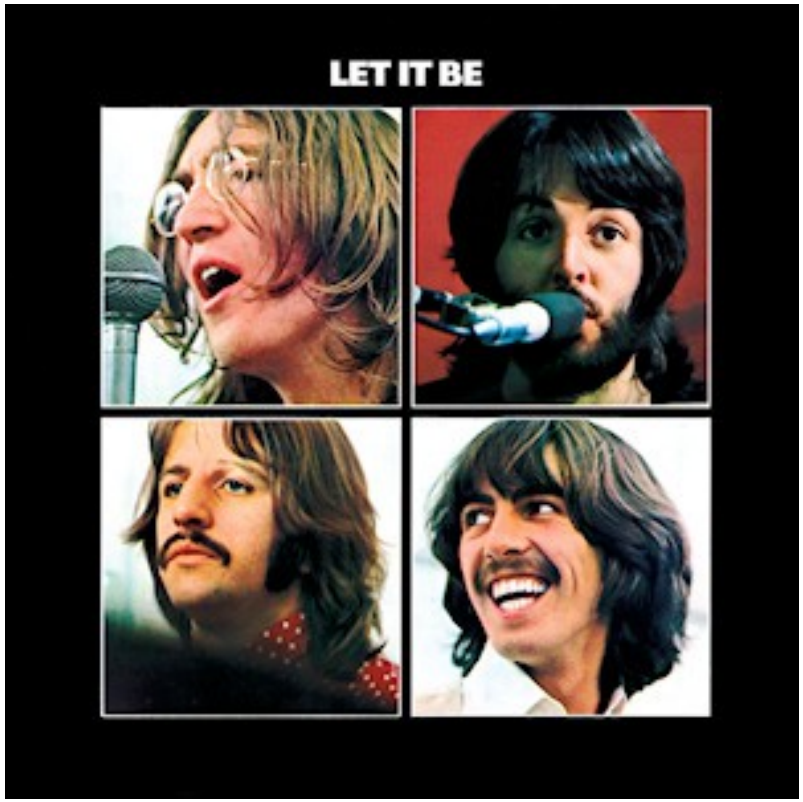
Provenance

- **not (quite)** what is usually meant by (say) art historians
- “information about entities, activities, and people involved in producing a piece of data or thing”
- http://www.w3.org/TR/prov-overview/

Example

Musicians and performances

Example: musicians and performances



On this 1970 album, Paul McCartney plays piano, bass guitar, and more:

On the song “Across the Universe”, he plays piano;

On the song “Get Back”, he plays bass guitar.

How might we record this as linked data?

https://en.wikipedia.org/wiki/Let_It_Be

Music Ontology (MO) - Performance

http://musicontology.com/specification/

http://musicontology.com/specification/#term-Performance

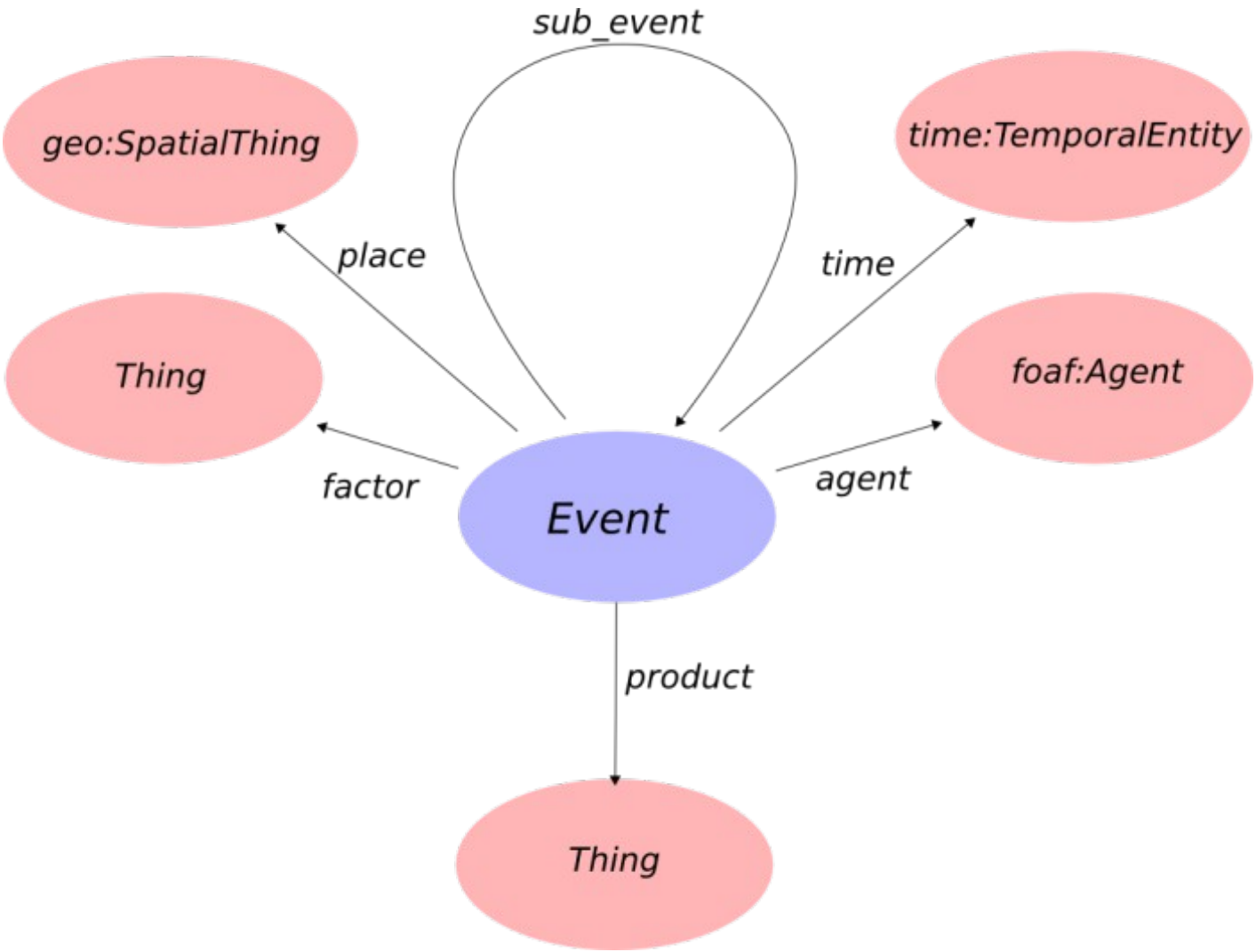
Performance

A performance event. It might include as agents performers, engineers, conductors, or even listeners. It might include as factors a score, a MusicalWork, musical instruments. It might produce a sound:-)

URI:	**http://purl.org/ontology/mo/Performance**
Label:	performance
Status:	stable
Parent Class:	**http://purl.org/NET/c4dm/event.owl#Event**
Properties:	**conductor**, **instrument**, **listener**, **performance_of**, **performer**, **produced_sound**, **recorded_as**, **singer**

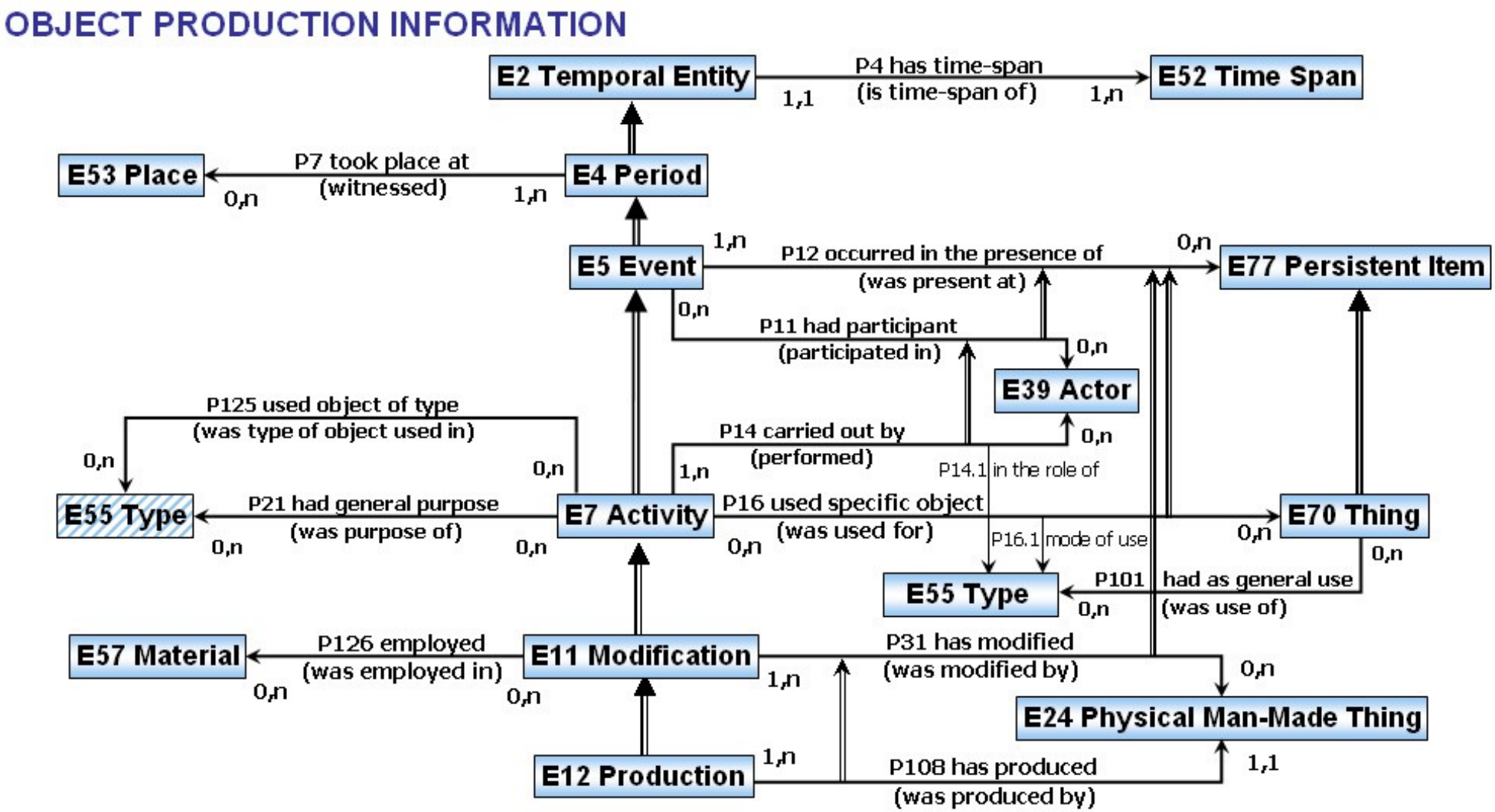
The Event Ontology

http://motools.sourceforge.net/event/event.html



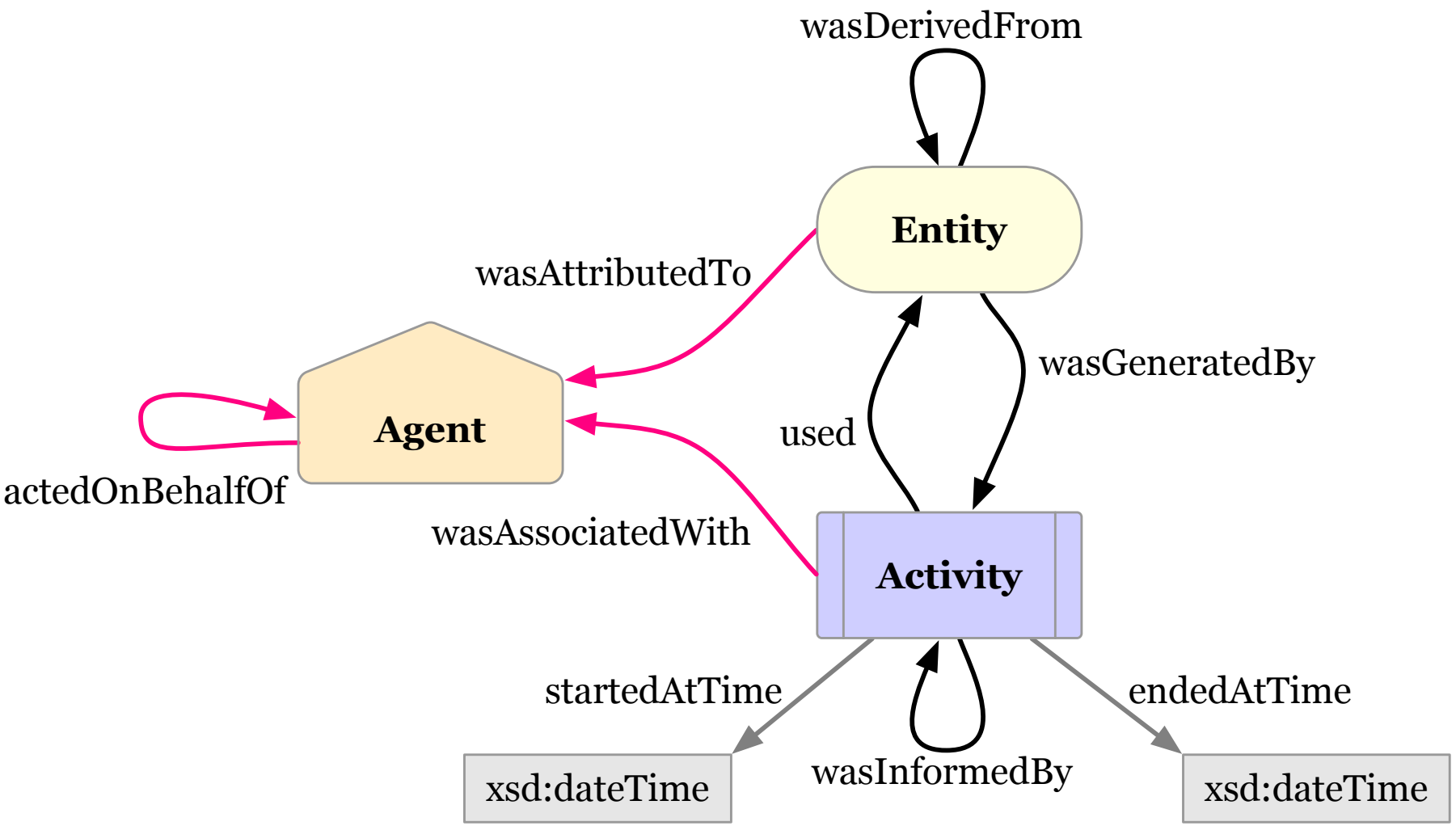
CIDOC CRM

http://www.cidoc-crm.org/sites/default/files/objProduction.jpg

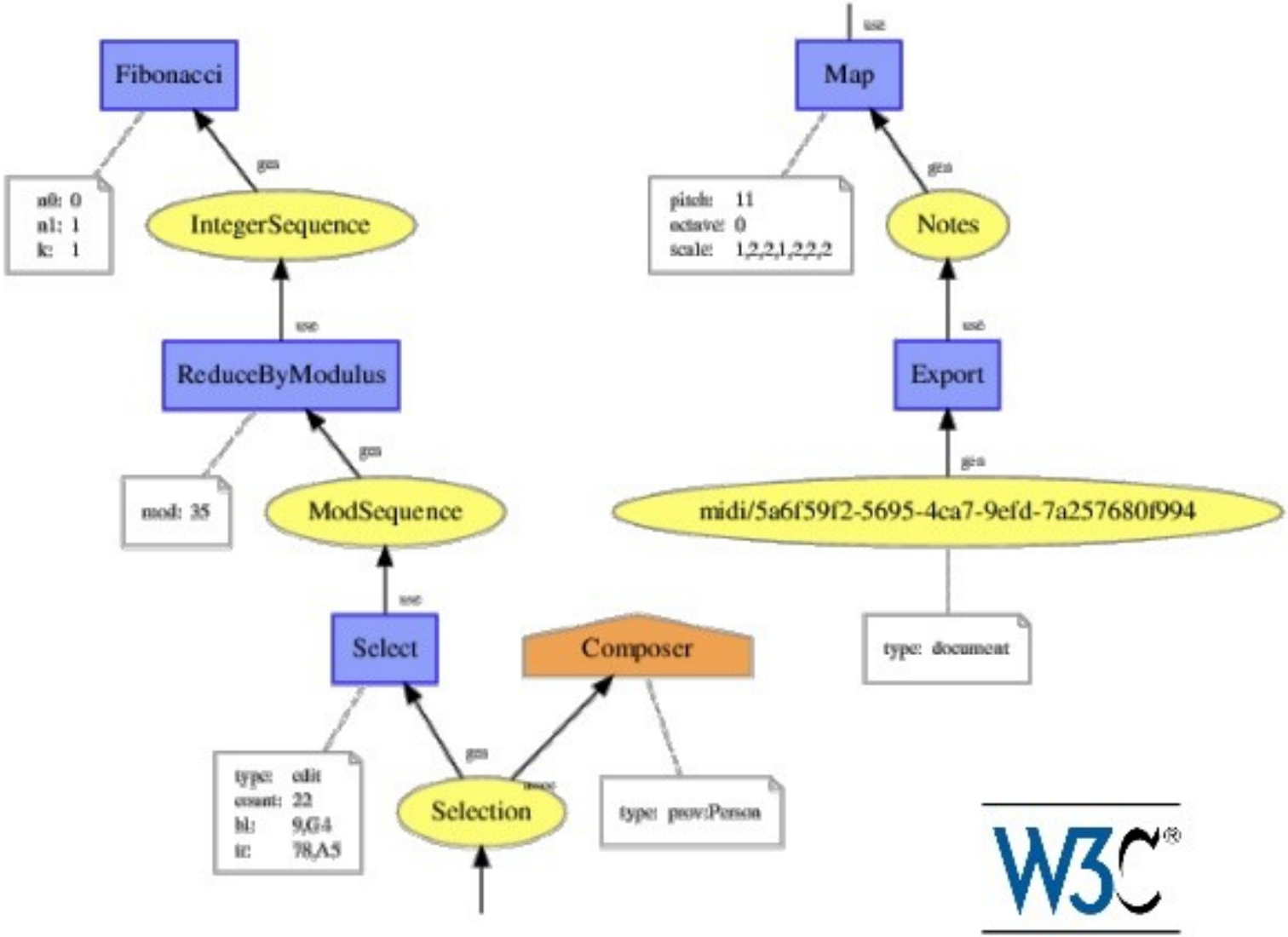


W3C Provenance Ontology (PROV-O)

http://www.w3.org/TR/prov-o/



Numbers into Notes PROV-O example

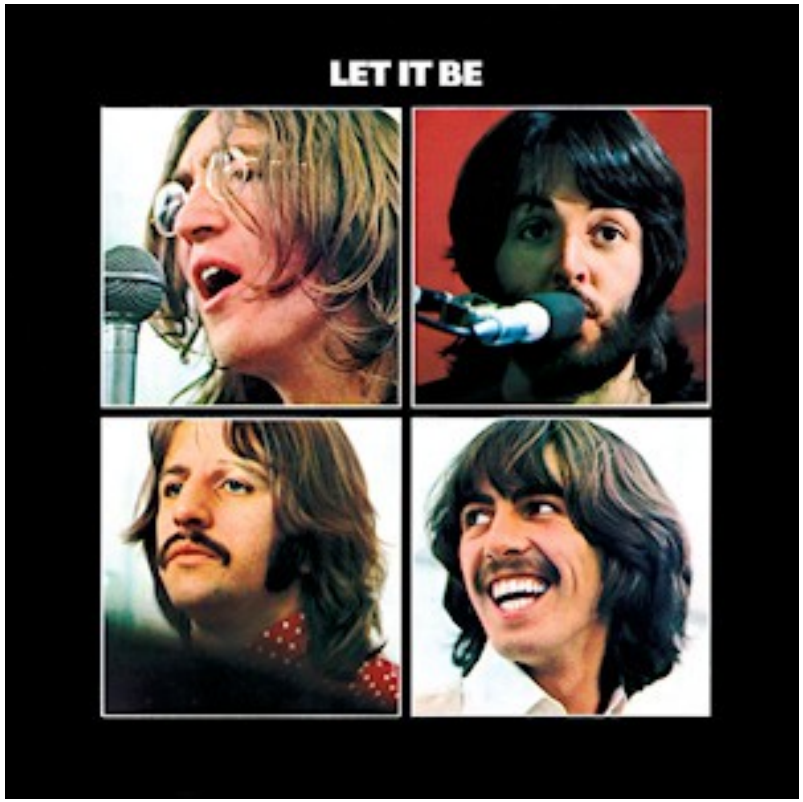


David De Roure

Back to the music performances...

https://www.hanselman.com/blog/YakShavingDefinedIllGetThatDoneAsSoonAsIShaveThisYak.aspx

Example: musicians and performances



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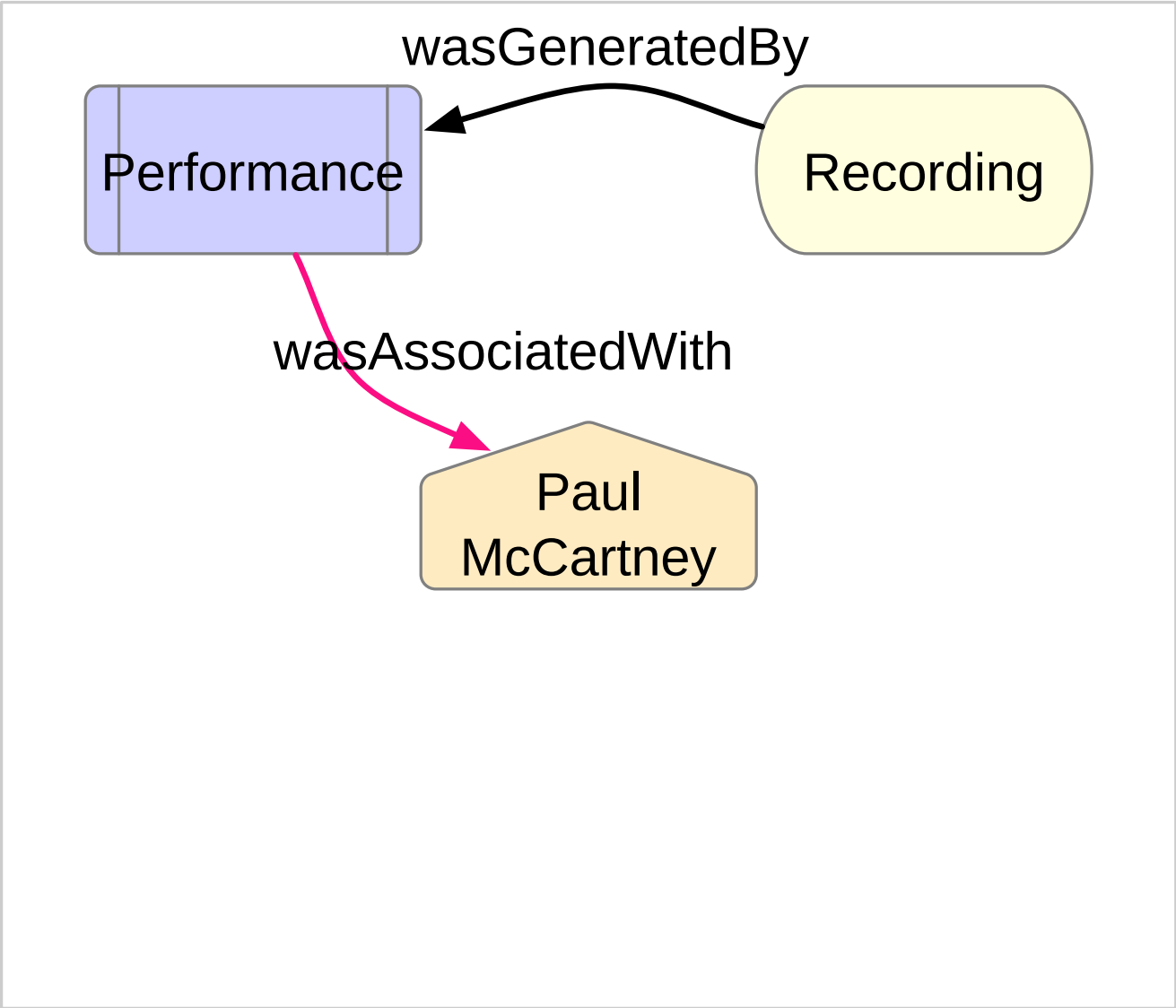
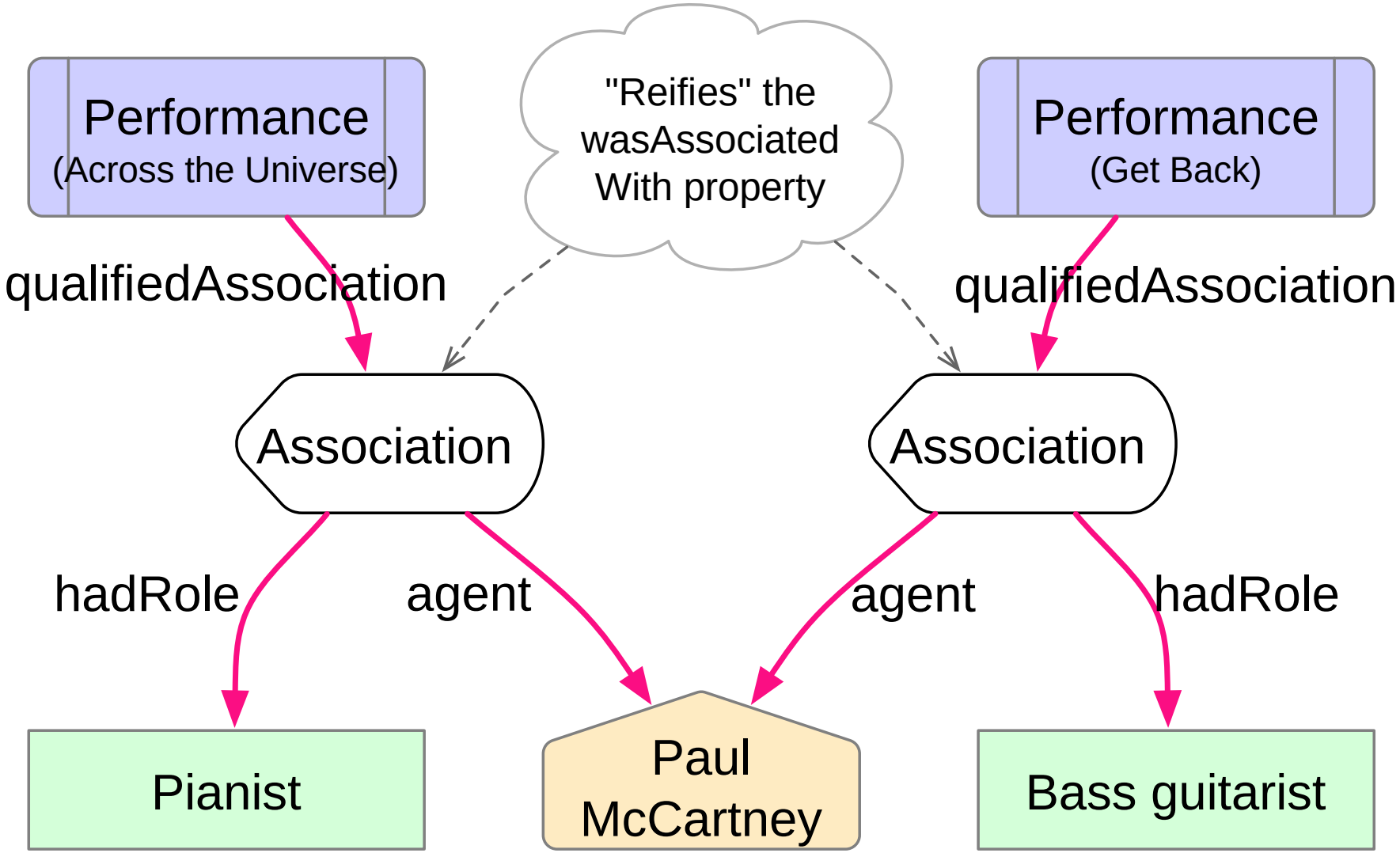
Performance as Activity (using PROV-O)



View PDF...

(Performances.pdf)

Qualified association: “Reifying” the relation



Example data

fast-project.annalist.net/annalist/c/Carolan_Guitar/d/Composition/L

iGoogle GitHub Luggage ImageWeb Search In progress Unsorted Read Later Travel Projects DuckDuckGo Bing Tools

Export all Canvases in OmniGraffle - Home - Thought Asylu... | PROV-O: The PROV Ontology | Carolan inspires a new composition - View of perform...

Home Carolan_Guitar Composition User gklyne Logout

View of performance

Id	Landmarks	Type	Composition event
Label	Carolan inspires a new composition		

Comment

Carolan has passed some time in Bristol with Rob King and Pippa Marland, founders of the celtic-jazz-fusion band Carmina.

"In the interview, Rob and I had the idea of using one of the codes on the guitar to map to a composition that one person might begin and then subsequent guardians of the guitar adapt and develop." (Pippa Marland)

"it seems that the guitar could act as a kind of 'medium' between all the different players that have it in their possession – but also that 'a sense of place' could be very significant as well. Towards the end of the interview we came up with the idea of the 'souvenir', and this prompted me to think along a kind of parallel line – that the guitar couldn't give you an actual physical souvenir, like a plastic model of the Eiffel Tower or plaster-cast of Michelangelo's David – but it could perhaps in being handed from musician to musician present to the holder something of the artistic gifts of it previous 'owner'. This sounds very metaphorical, but perhaps might be made real through the digital medium. I mean that the actuality of it being handled and played by someone you admire could become a kind of 'ongoing' souvenir – when you hold it and play it again perhaps something of that player's power might be transmitted to you – the analogy of a seance comes to mind!" (Rob King)

Location: Bristol

People

Person id	Name	Role
Pippa_Marland	Pippa Marland	Narrator
Pippa_Marland	Pippa Marland	Composer
Pippa_Marland	Pippa Marland	Lyricist
Rob_King	Rob King	Narrator
Rob_King	Rob King	Composer

Entities used

Used (Entity)
Carolan Guitar
Pippa's saxophone

Works performed

Work performed
Landmarks, by Carmina

See also

URL
carolanguitar.com/2015/05/10/43-landmarks/
youtu.be/wTmAPbgA

Edit Copy Close View description Set default view Customize

Choose view: View of performance Show view

Turtle JSON-LD DATA

http://fast-project.annalist.net/annalist/c/Carolan_Guitar/d/Composition/Landmarks/

Example

Describing historical places

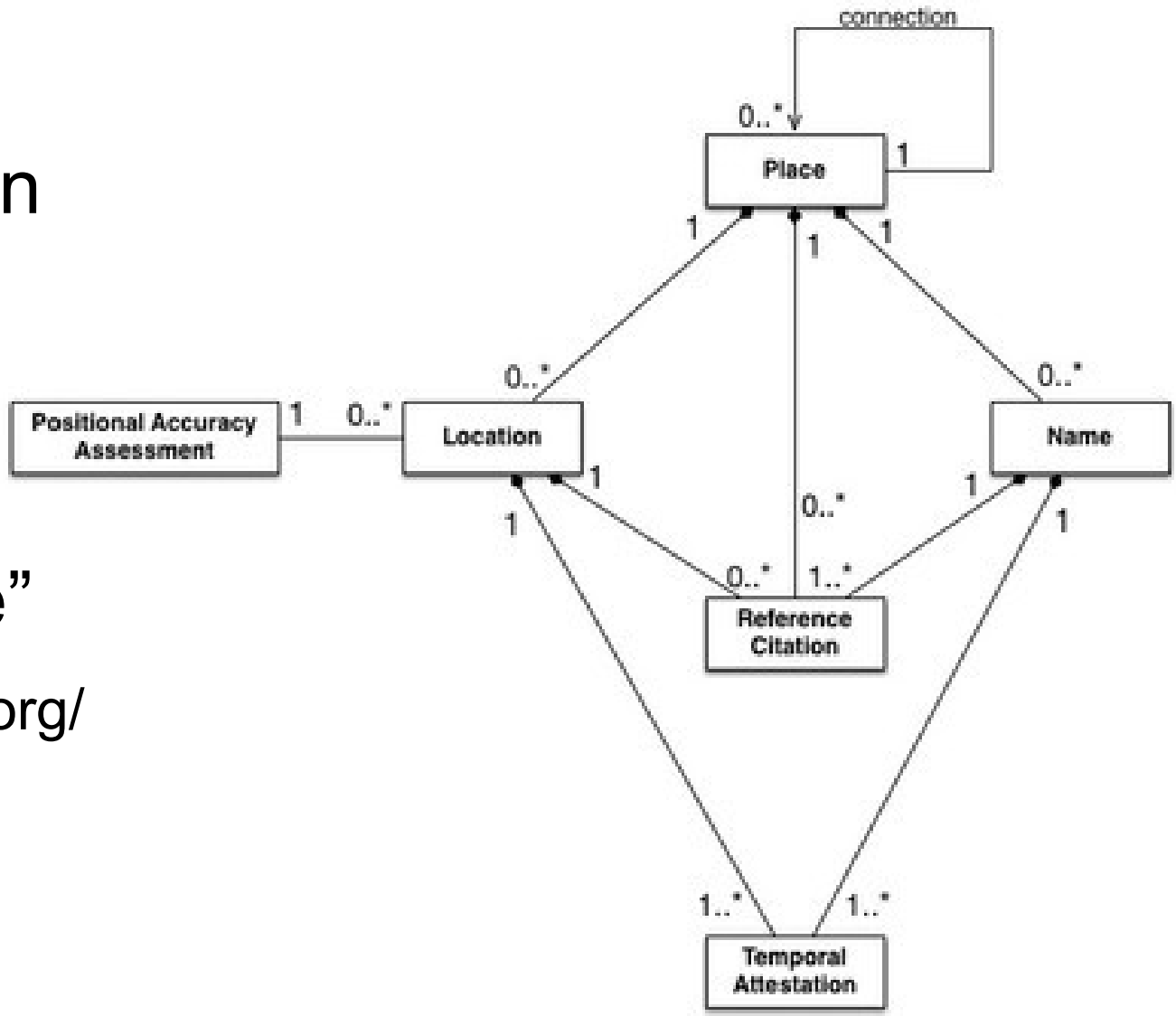
What is a “place”?

More than a geographic location

more than a name

Pleiades: "constructed by human experience”

- https://pleiades.stoa.org/help/data-structure
- *(attrib. Yi-fu Tuan)*



https://pleiades.stoa.org/help/pleiades-data-model

Opole, 1222-1806

Opole

Opolí, Oppein, Oppeln, Uopole, Ополе [Info]

Current Hierarchy [Info]

+ Poland (Nation)
  + Opolskie (Voivodeship)
    + Opole (County)
      + Opole (Inhabited Place)

Location [Info]

50.67211, 17.92533 (N 50°40'20" E 17°55'31")

Citation

Chicago Manual of Style, MLA, BibTeX.

Permanent URI

https://emplaces.info/12345678

Authorities

GeoNames, Getty TGN, WikiData, GND

Name Attestations [Info]

Name	Language	Date	Source
Opol	(lat)	1222-1431	Dokumenty Śląska
Opolie	(ita/pol)	1228-1483	Dokumenty Śląska
Oppol	(ger/lat)	1226-1487	Liber fundationis episcopatus Vratislaviensis
Oppelen	(ger)	1608	Map (Jan Baptista Vrients)

Calendars [Info] [Sources]

< 1500 **1584** > 1800

Julian (NS) Gregorian

Related Places [Info]

Name	Type	Relationship

Maps [Info] [Sources]

Current 1561 1608 1740 1794

Description [Info] [Sources]

Opole is a city located in southern Poland on the Oder River (Odra). With a population of approximately 127,792 (January 2017), it is the capital of the Opole Voivodeship and also the seat of Opole County. With it long history dating back to the 9th century, Opole is considered to be one of the oldest towns in Poland.

Historical Hierarchies [Info] [Sources]

Administrative Ecclesiastical Military Judicial

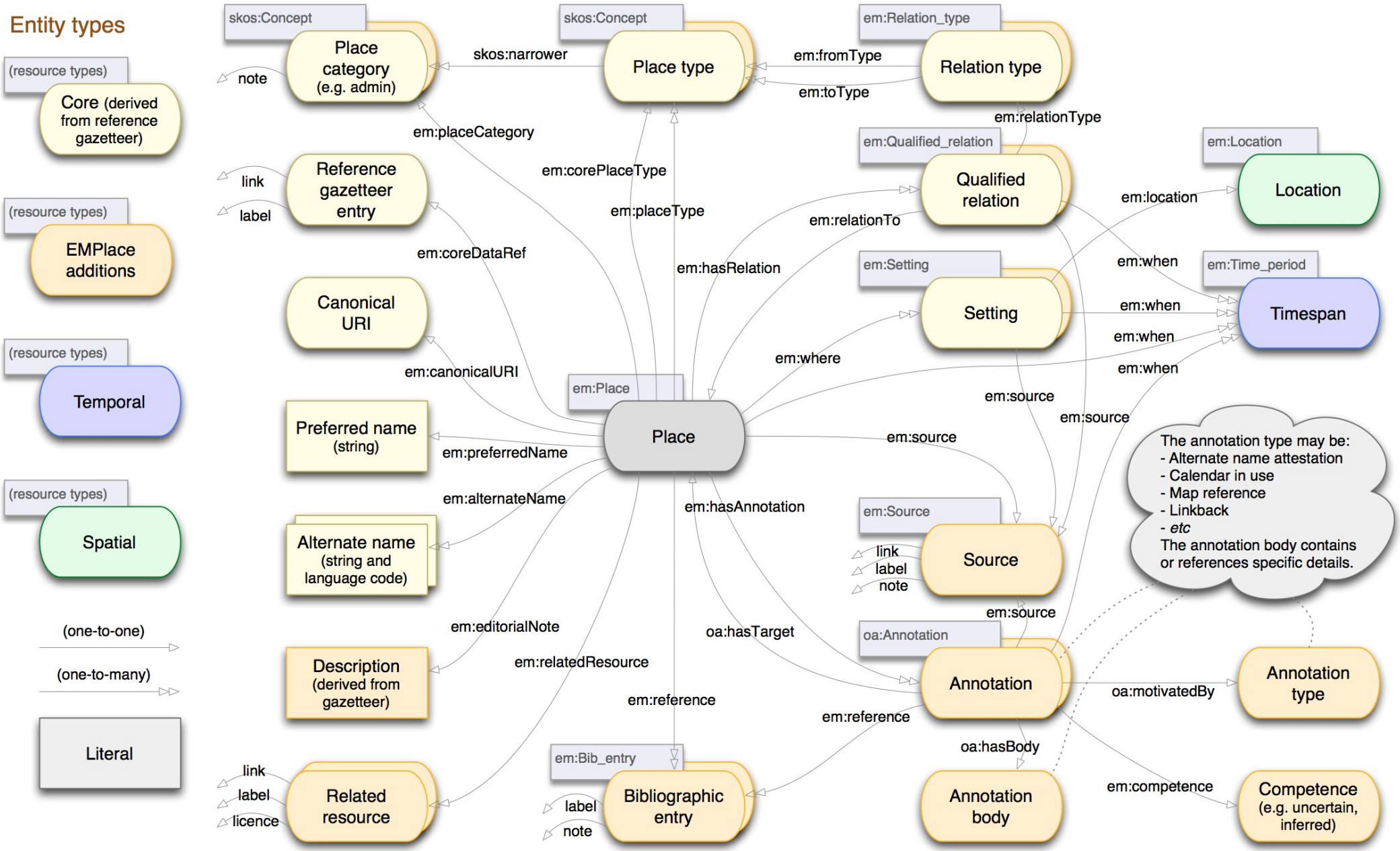
1490-1521
1521-1526
1526-1742
1742-1806

Holy Roman Empire
1348-1526
Bohemian Crown

Places data model overview (work in progress)

Data model for EMPlaces using annotations (draft 2018-05-29)

20180305-EMPlaces-data-model-using-annotations.graffl



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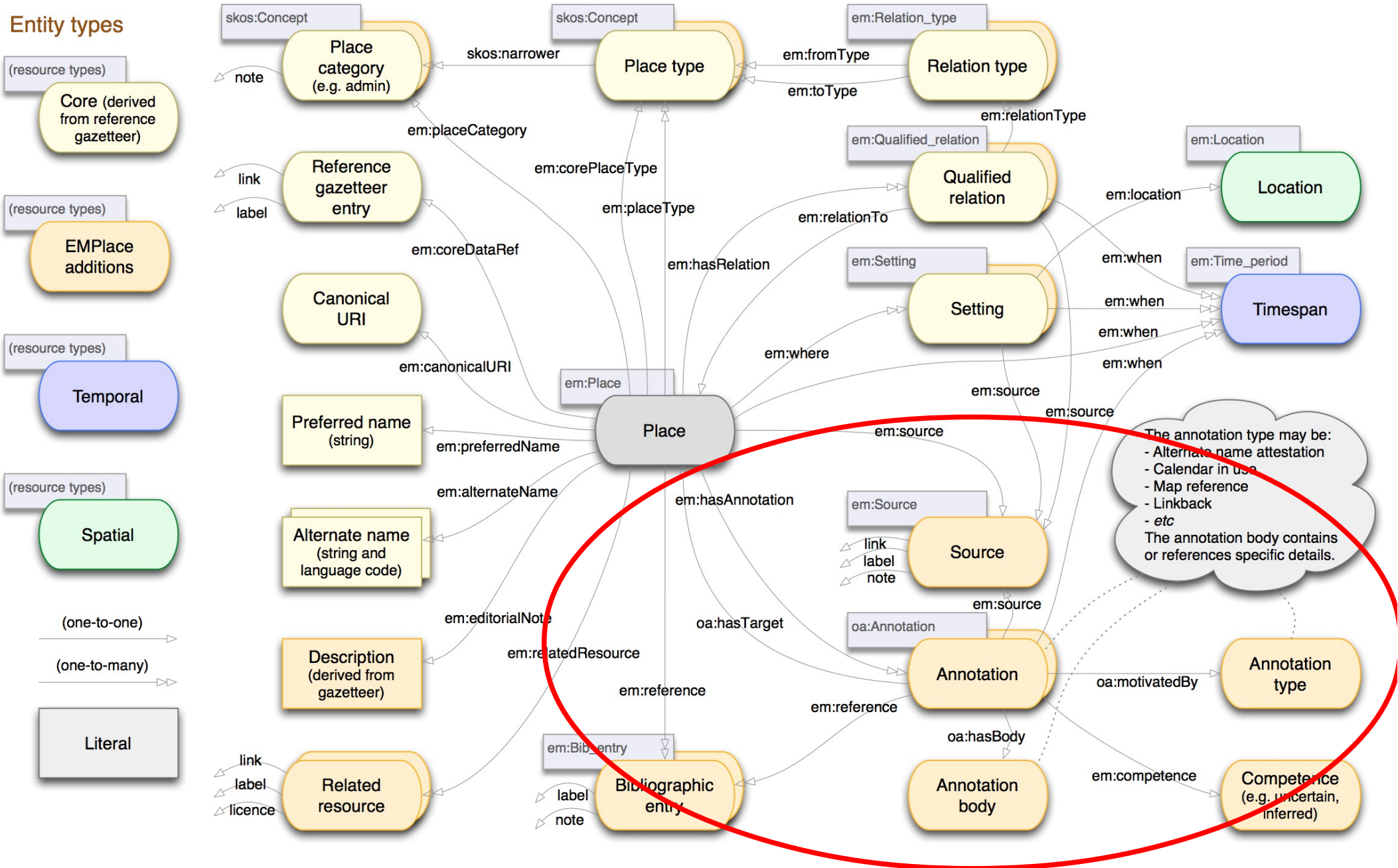
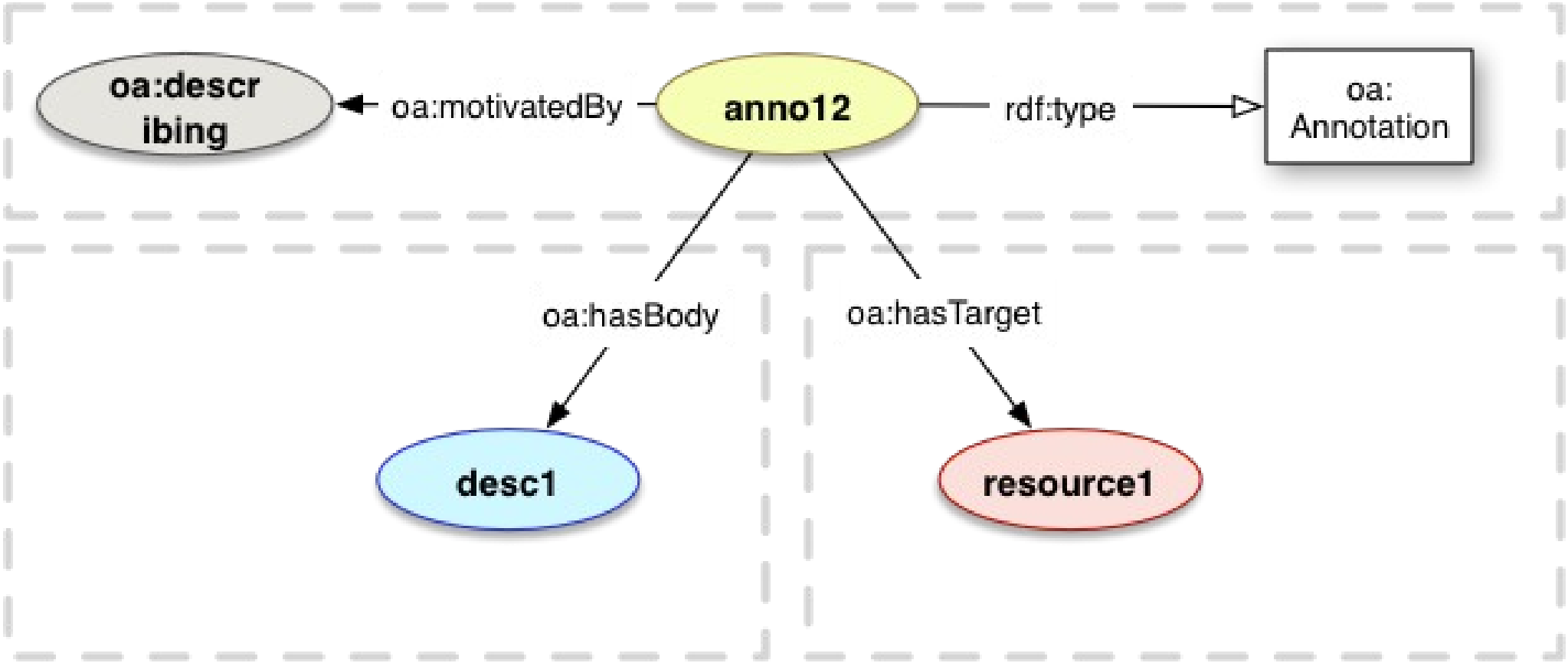


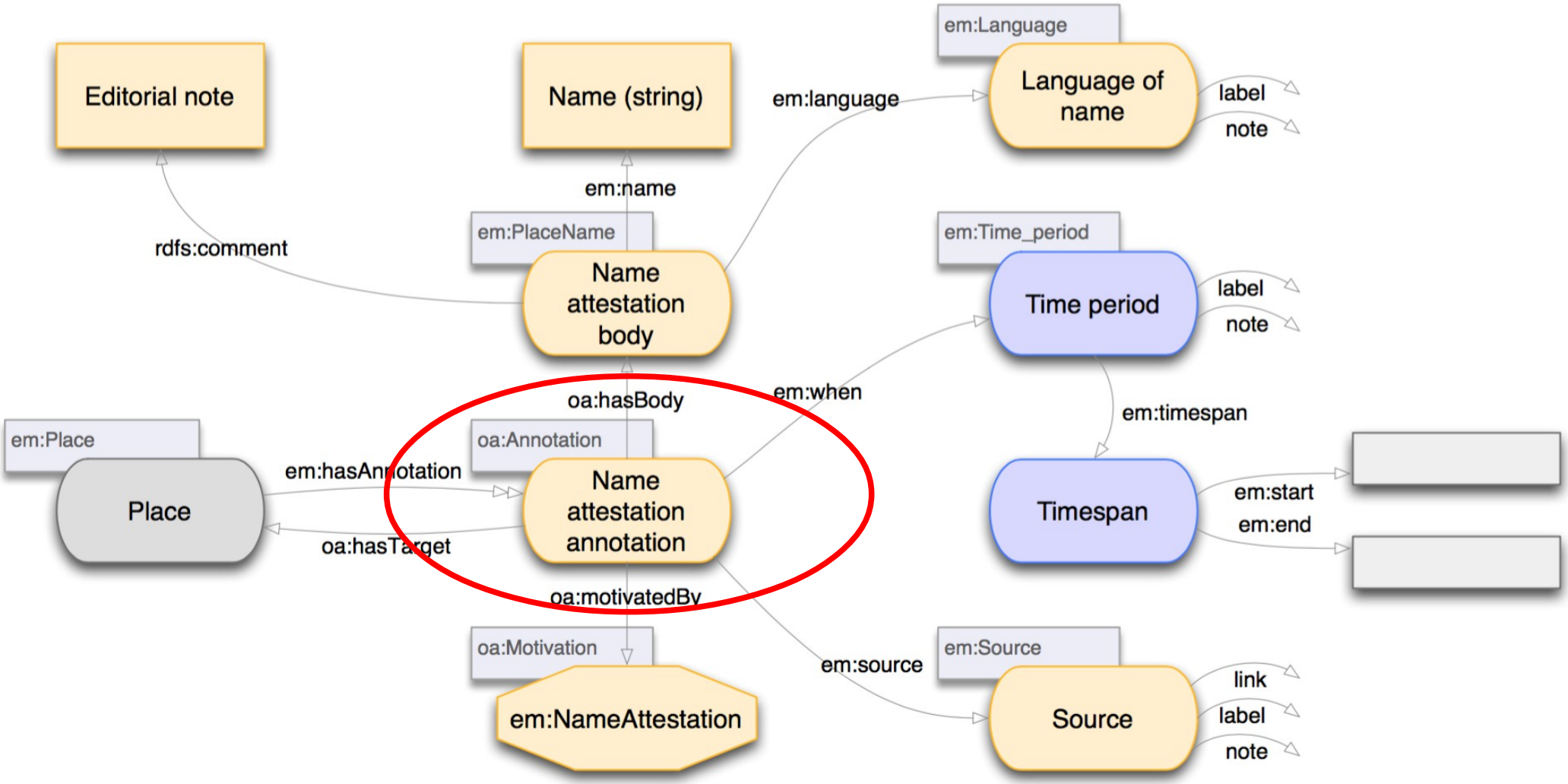
Web Annotations



http://www.w3.org/TR/2017/REC-annotation-vocab-20170223/images/examples/motivation.png

Web Annotations for Name Attestation

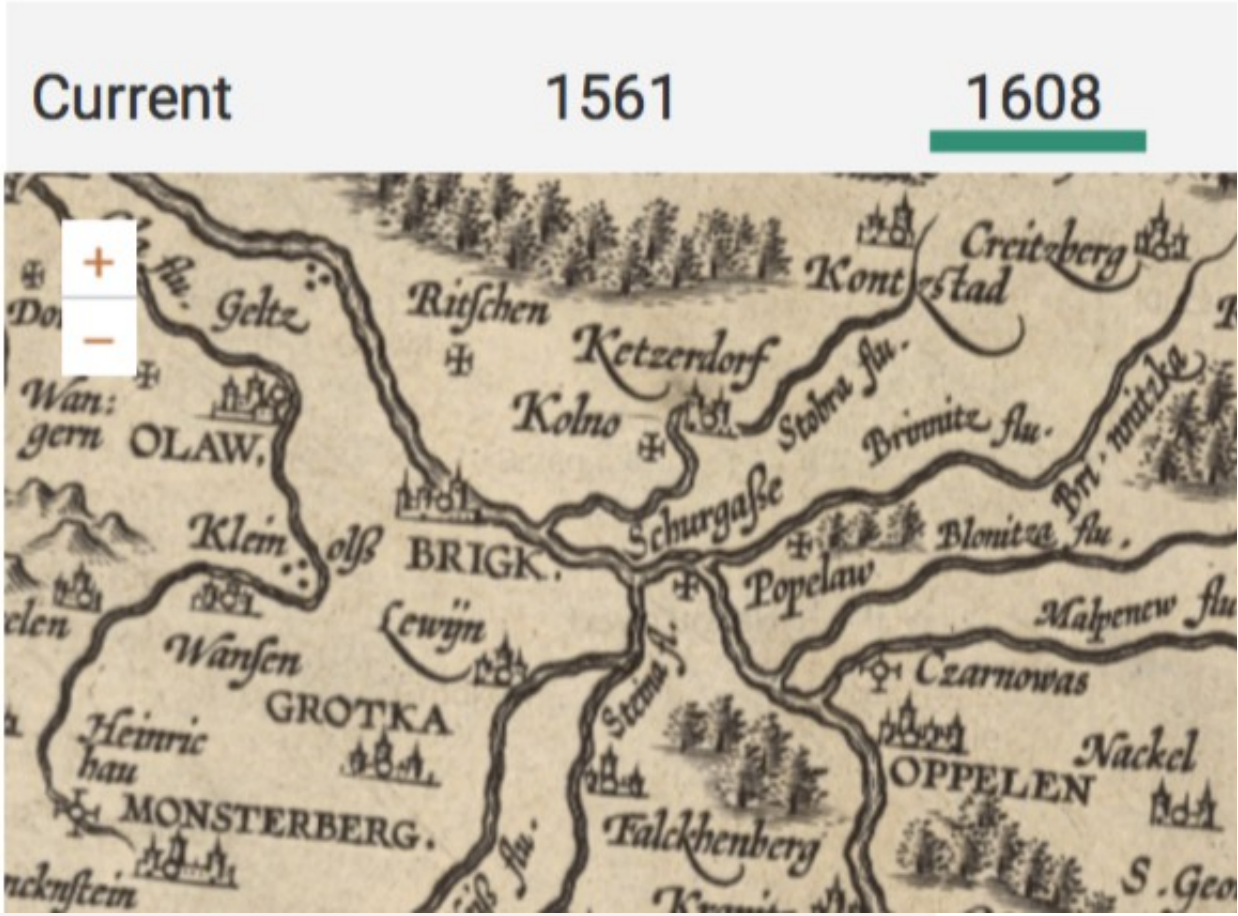
(Annotations can reference additional context)



Opole name attestation

“Oppelen”

- German
- Around 1608
- According to map “Jan Baptista Vrients”



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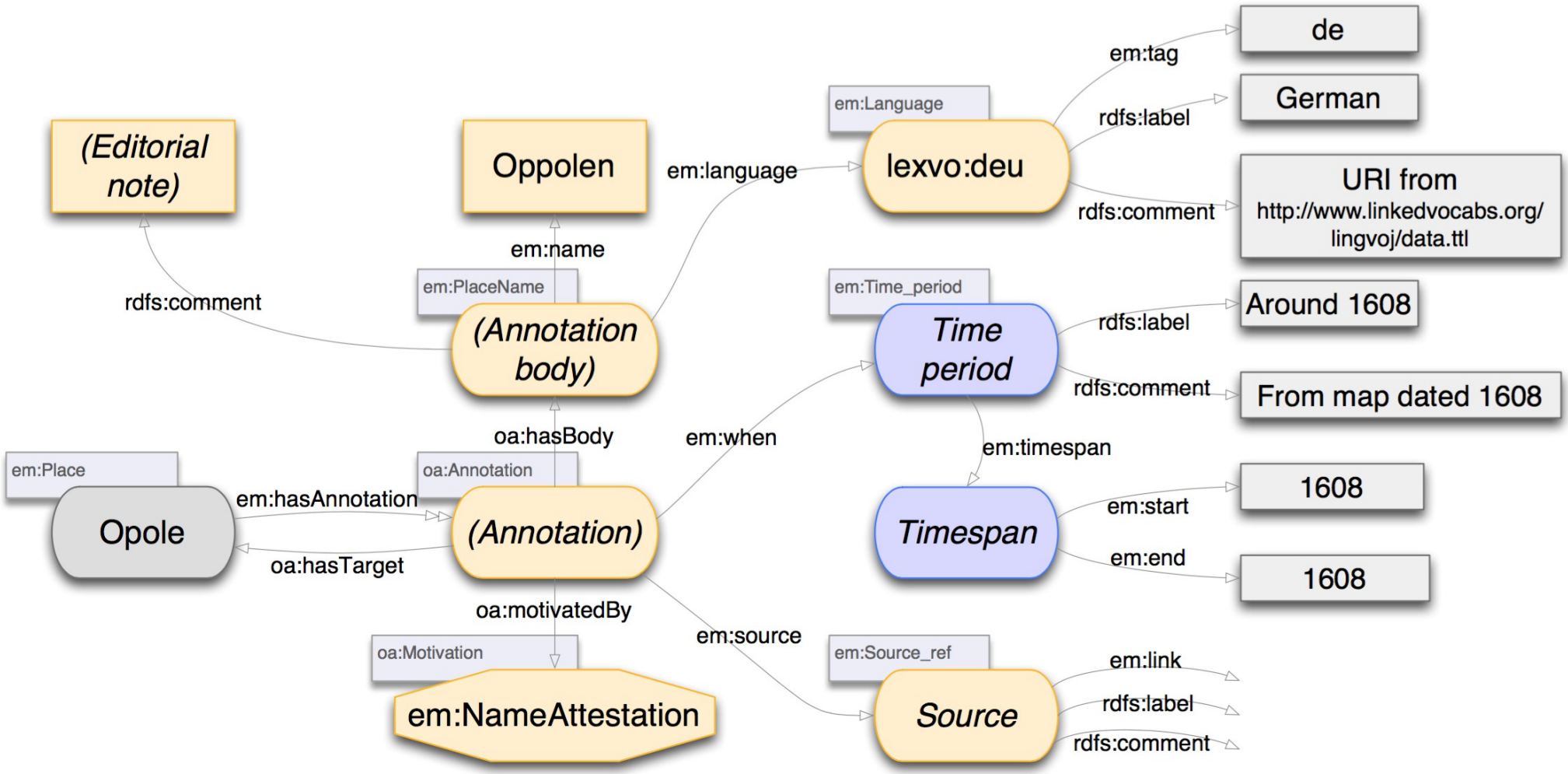
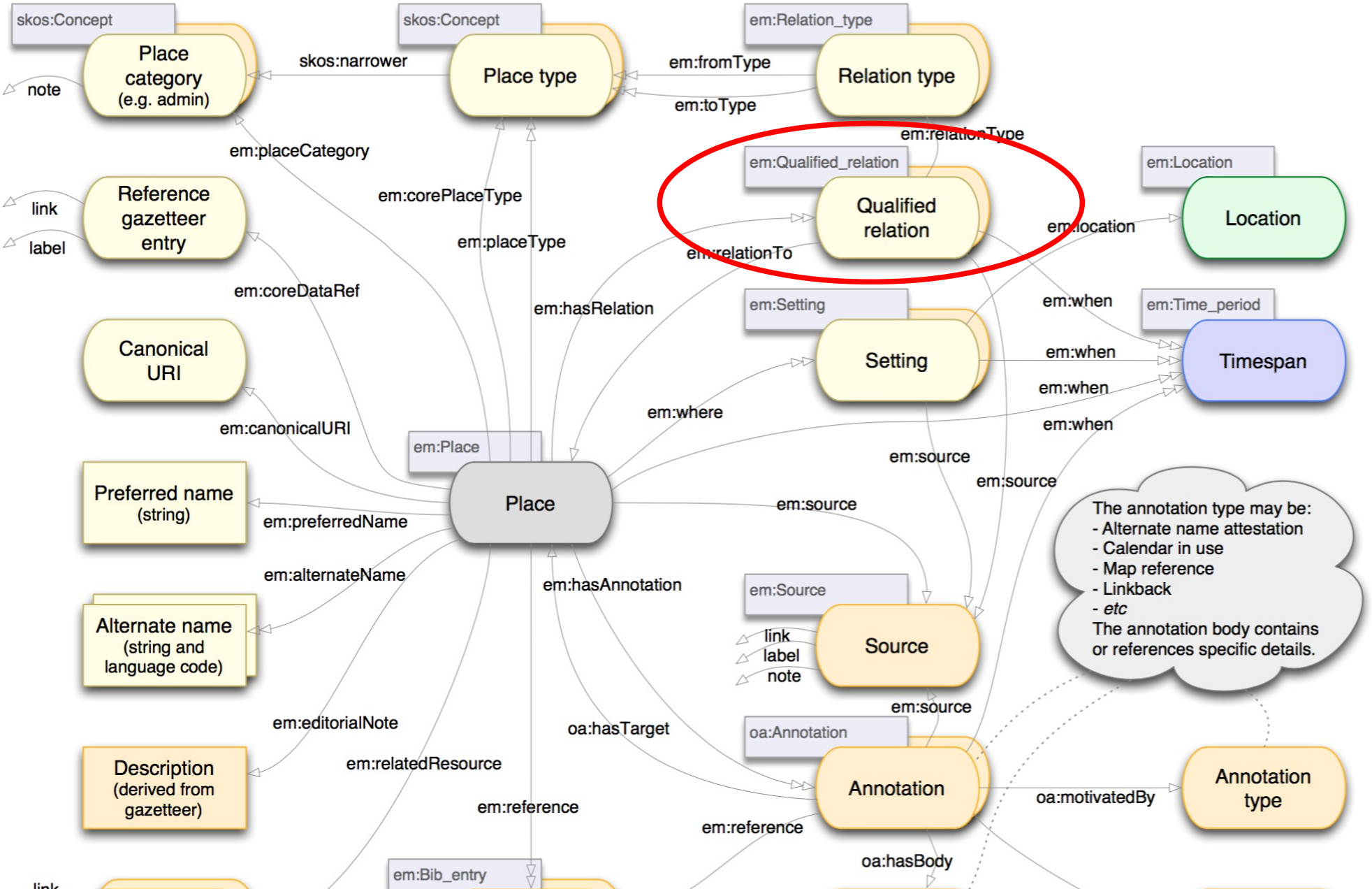
Opole name attestation example



Place hierarchies are handled differently



Conclusion – contextual information in RDF

The “reified relationship” pattern appears in several places (e.g. PROV, CIDOC-CRM).

Bob DuCharme (author of "Learning SPARQL") notes:

> *"RDF's very simple subject-predicate-object data model is a building block that you can use to build other models that can make your applications even better"*

But to avoid every application “rolling its own” reified property terms, our work with place data suggests Web Annotations could provide a useful common structure for contextual information.

Annalist framework for creating annotations (?)