ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
UNIVERSITY OF CRETE

Knowledge Graph for SSH: Part II

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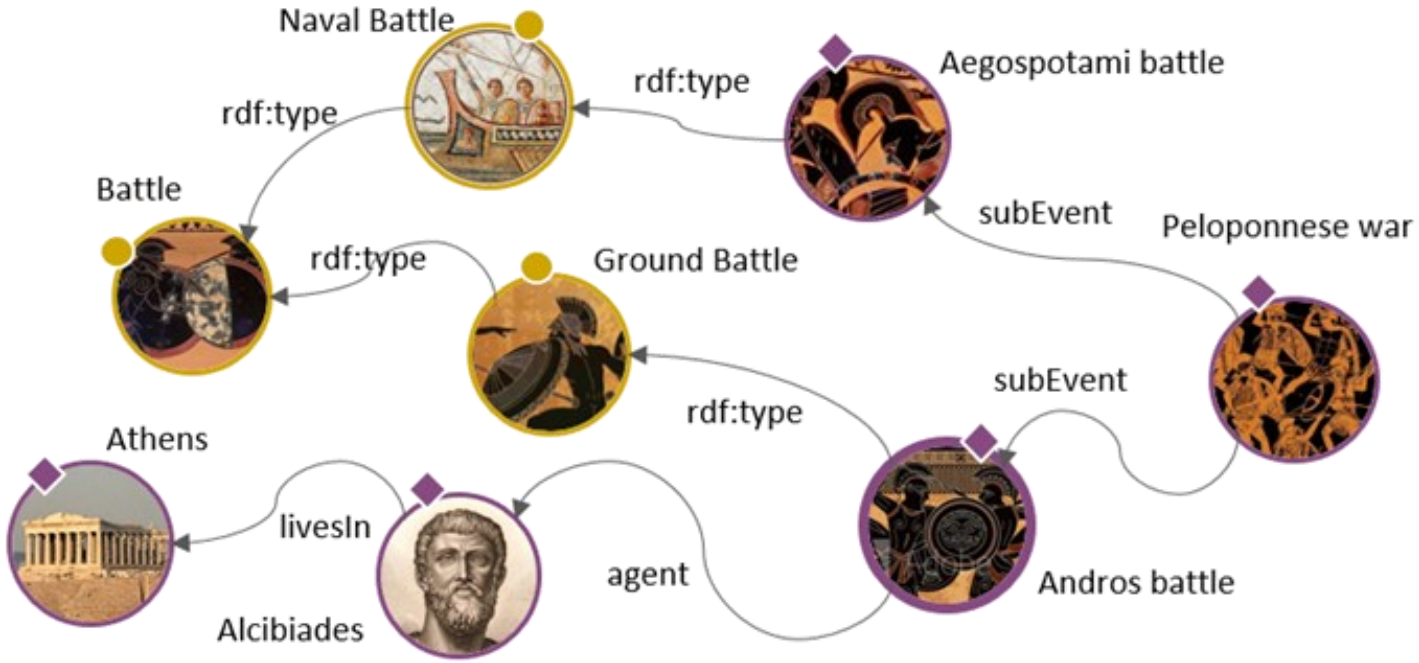
Funded by the European Union

Horizon ERA Chair TALOS AI4SSH Project funded by the European Commission Grant Agreement n° 101087269, https://cordis.europa.eu/project/id/101087269

How to represent a KG?

1. What is a Knowledge Graph?
2. Examples
3. **How to represent a KG?**

- Part II: RDF Graph



Web of Data

- Access — A Uniform Resource Identifier (URI) is a unique sequence of characters that identifies a logical or physical resource used by web technologies.

- Open — Open Data is the idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control.

- Representation — RDF is a standard model for data interchange on the Web

- Linked — In computing, linked data (often capitalized as Linked Data) is structured data which is interlinked with other data so it becomes more useful through semantic queries.

- Semantics — The ultimate goal of the Web of data is to enable computers to do more useful work and to develop systems that can support trusted interactions over the network. The term “Semantic Web” refers to W3C’s vision of the Web of linked data.

Semantic Web

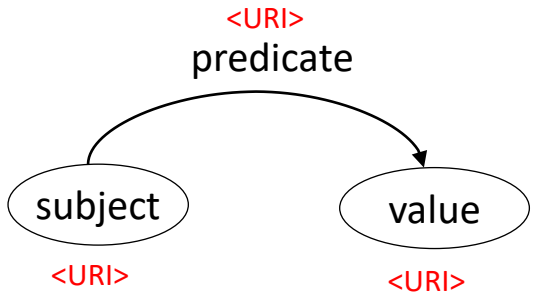
How to represent Knowledge Graph?

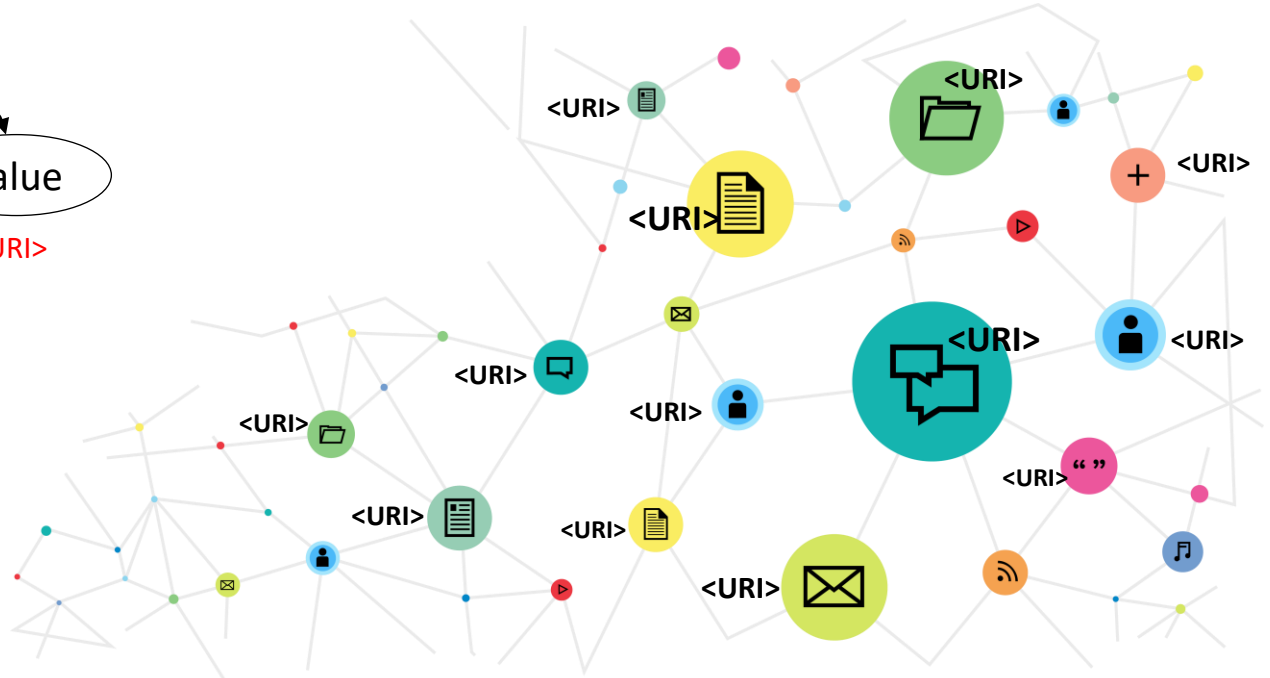
Resource Description Framework (**RDF**) is a model of directed labelled graphs:

- for representing information
- for linking information
- for data interchange on the Web

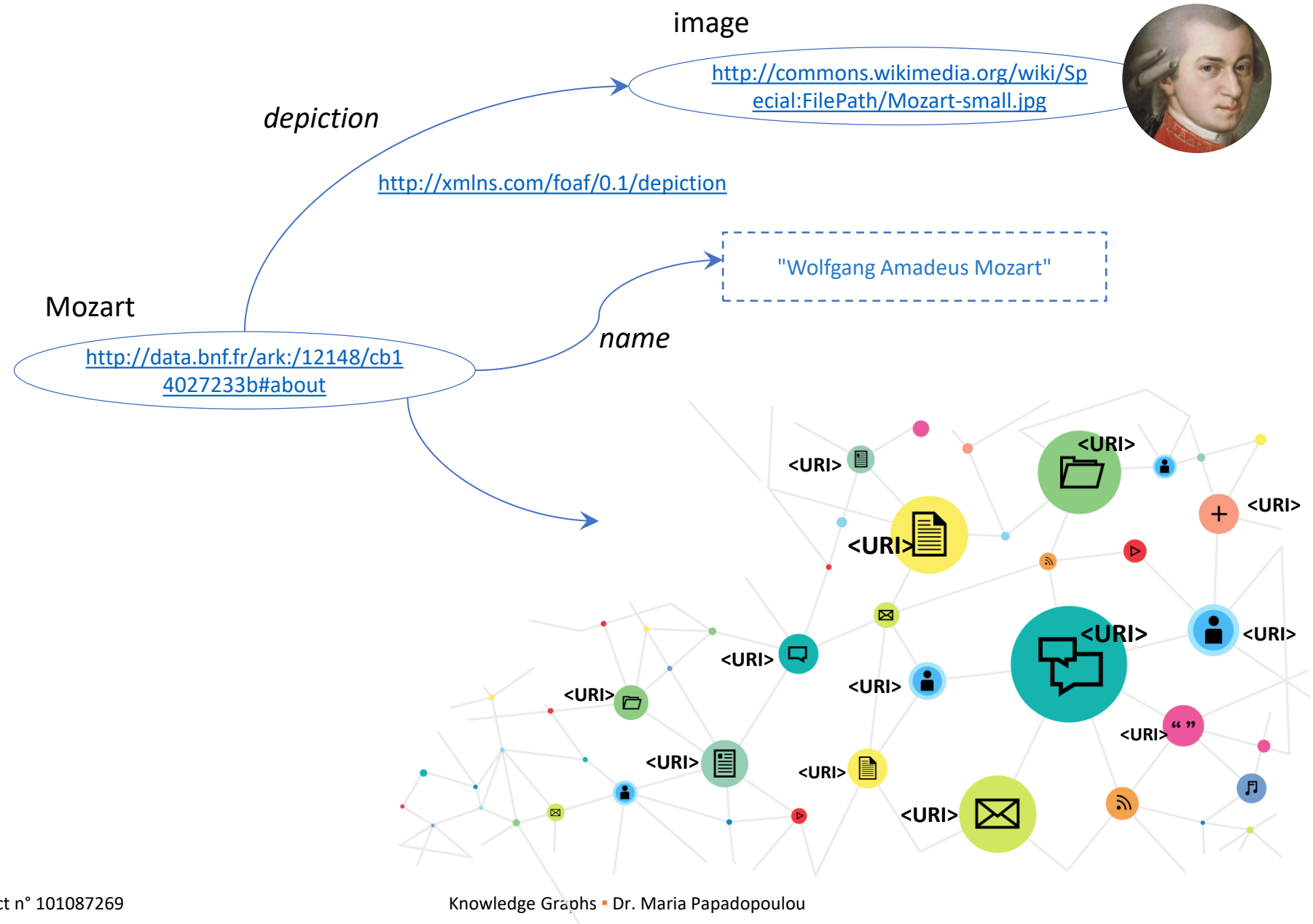
anything which can be identified by an URI on the internet

Triple:

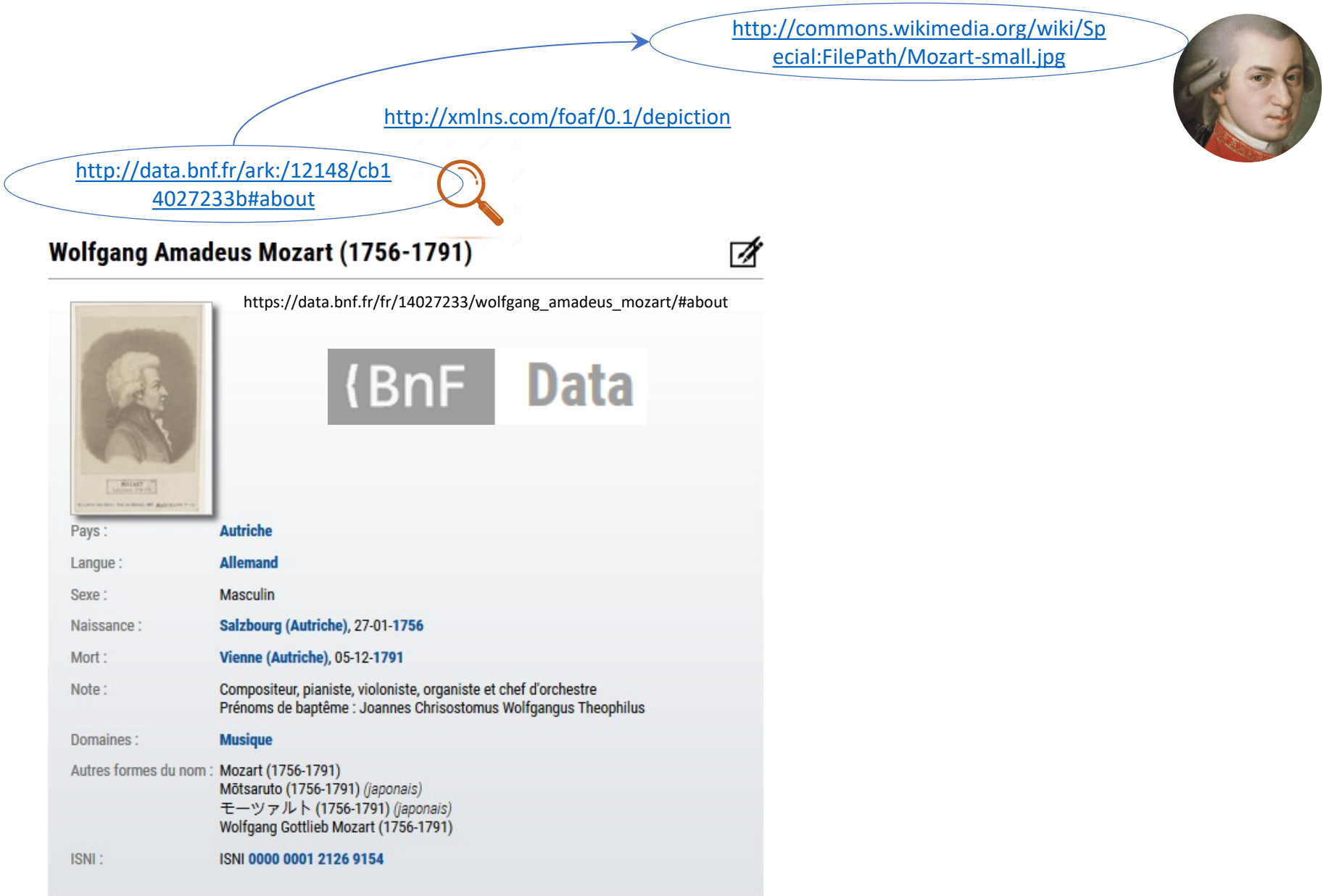




How to represent Knowledge Graph?



RDF Graph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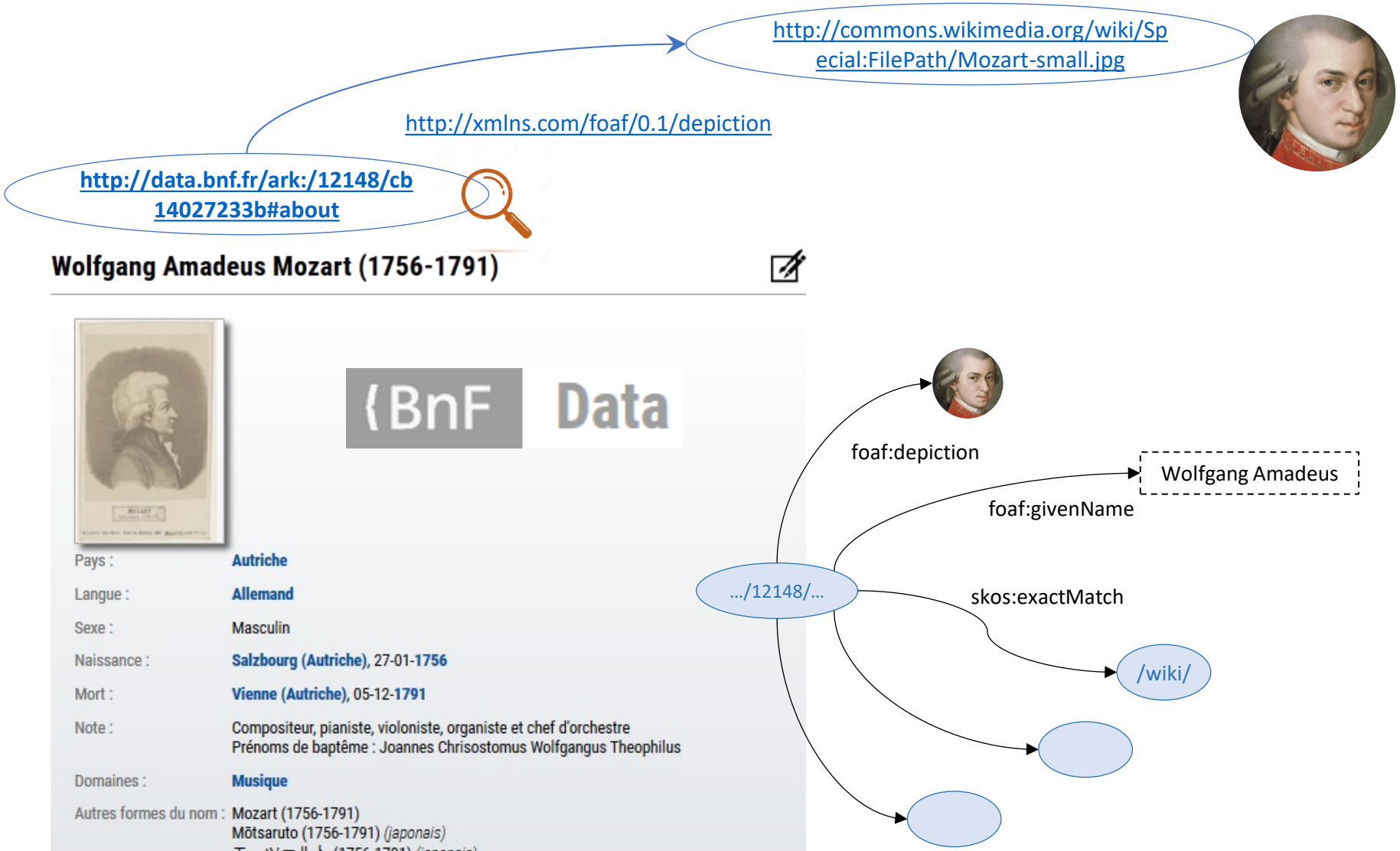
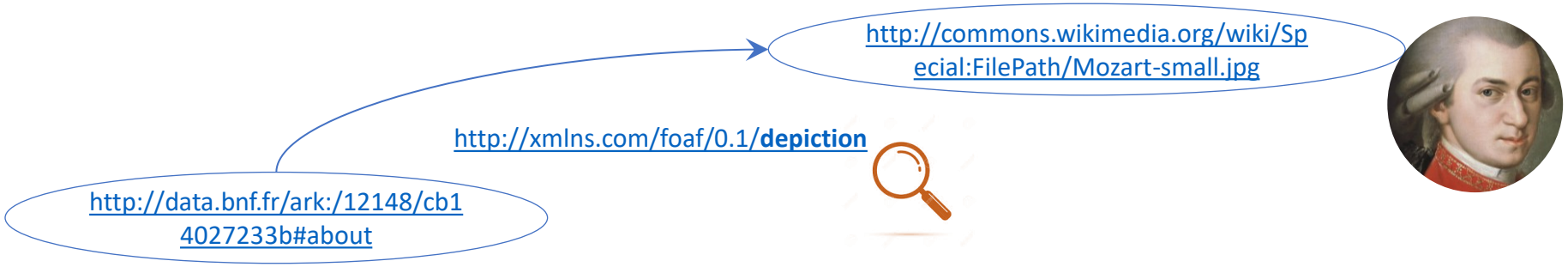
http://xmlns.com/foaf/0.1/depiction
http://data.bnf.fr/ark:/12148/cb14027233b#about
Wolfgang Amadeus Mozart (1756-1791)
https://data.bnf.fr/fr/14027233/wolfgang_amadeus_mozart/#about
BnF Data
Pays : Autriche
Langue : Allemand
Sexe : Masculin
Naissance : Salzbourg (Autriche), 27-01-1756
Mort : Vienne (Autriche), 05-12-1791
Note : Compositeur, pianiste, violoniste, organiste et chef d'orchestre
Prénoms de baptême : Joannes Chrisostomus Wolfgangus Theophilus
Domaines : Musique
Autres formes du nom : Mozart (1756-1791)
Mōtsaruto (1756-1791) (japonais)
モーツァルト (1756-1791) (japonais)
Wolfgang Gottlieb Mozart (1756-1791)
ISNI : ISNI 0000 0001 2126 9154

RDF Graph



https://data.bnf.fr/fr/14027233/wolfgang_amadeus_mozart/rdf.xml

RDF Graph



FOAF Vocabulary Specification 0.99

Namespace Document 14 January 2014 - *Paddington Edition*

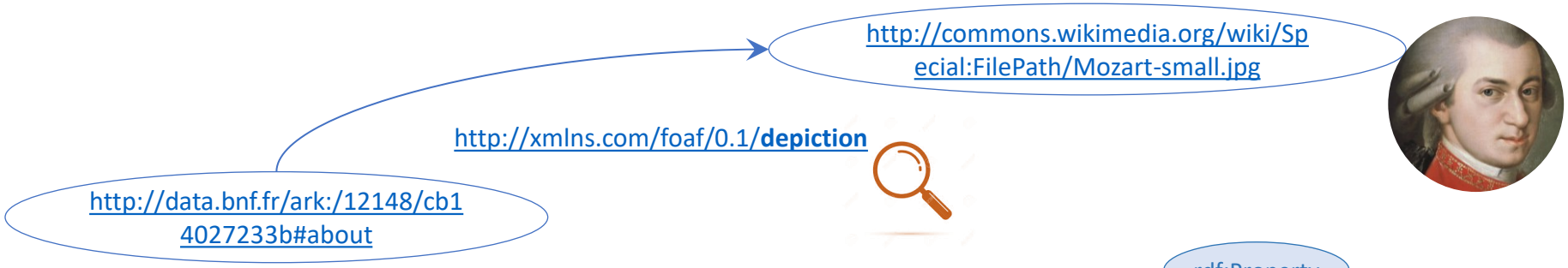
Property: foaf:depiction

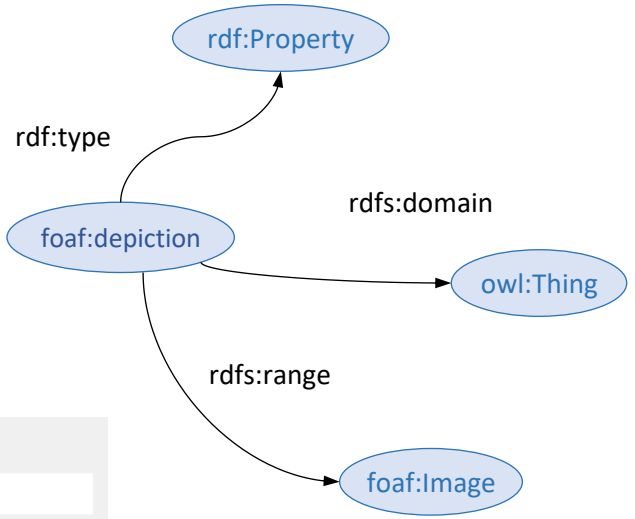
depiction - A depiction of some thing.
Status: testing
Domain: having this property implies being a Thing
Range: every value of this property is a Image

The `depiction` property is a relationship between a thing and an `Image` that depicts it. As such it is an inverse of the `depicts` relationship.

A common use of `depiction` (and `depicts`) is to indicate the contents of a digital image, for example the people or objects represented in an online photo gallery.

RDF Graph





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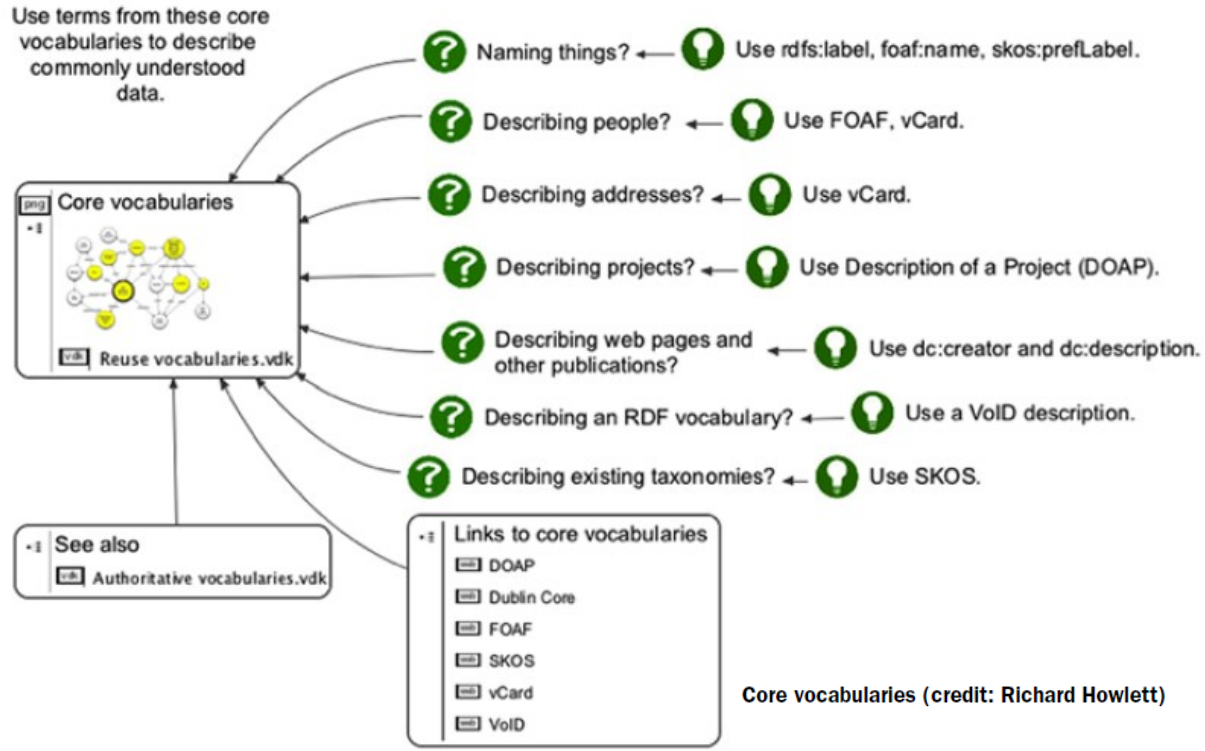
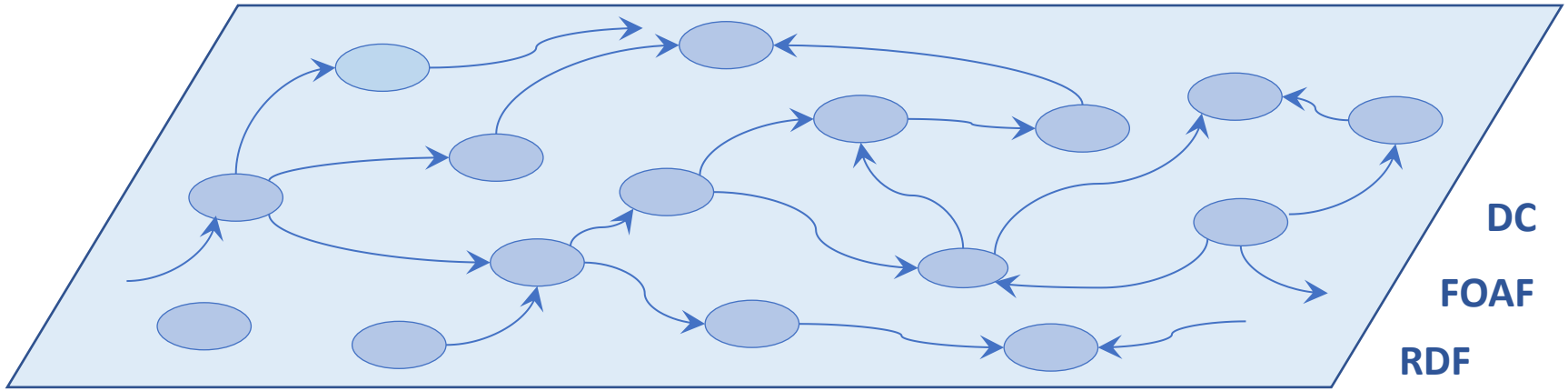
RDF Graph

RDF (family of RDF standards) is a framework for representing information in the web:

- **RDF**
- **RDFS**
- **FOAF**
- **DC**
- **SKOS**
- **OWL**
- **Etc.**



Core vocabularies (credit: Richard Howlett)



Knowledge Graph

Vocabularies – Ontologies

✓ **RDF**

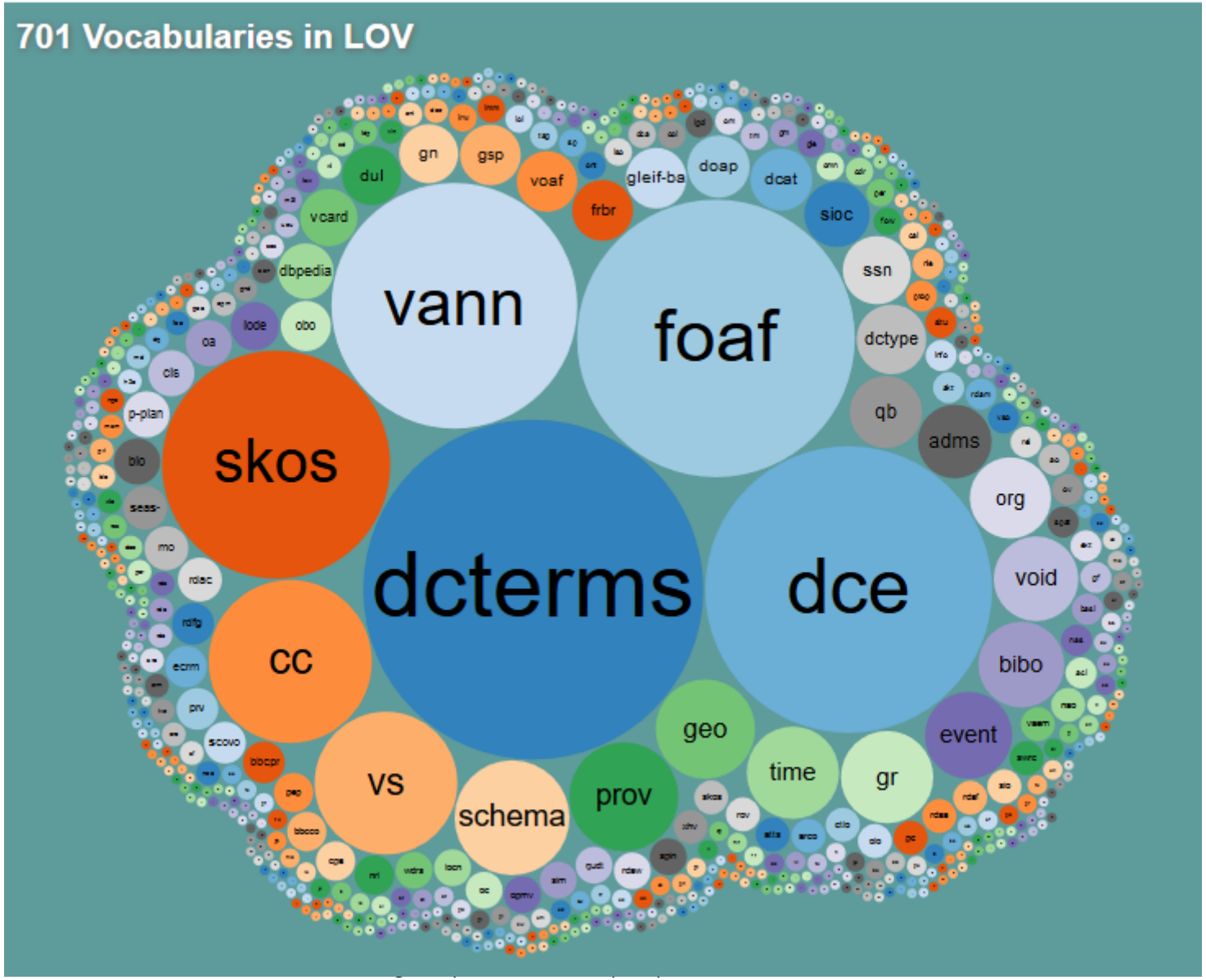
✓ **RDFS (RDF Schema)**

} “Basic” languages

Which Vocabulary?

Linked Open Vocabularies (LOV)

https://lov.linkeddata.es/dataset/lov



Predefined Namespace Prefixes

https://prefix.cc/

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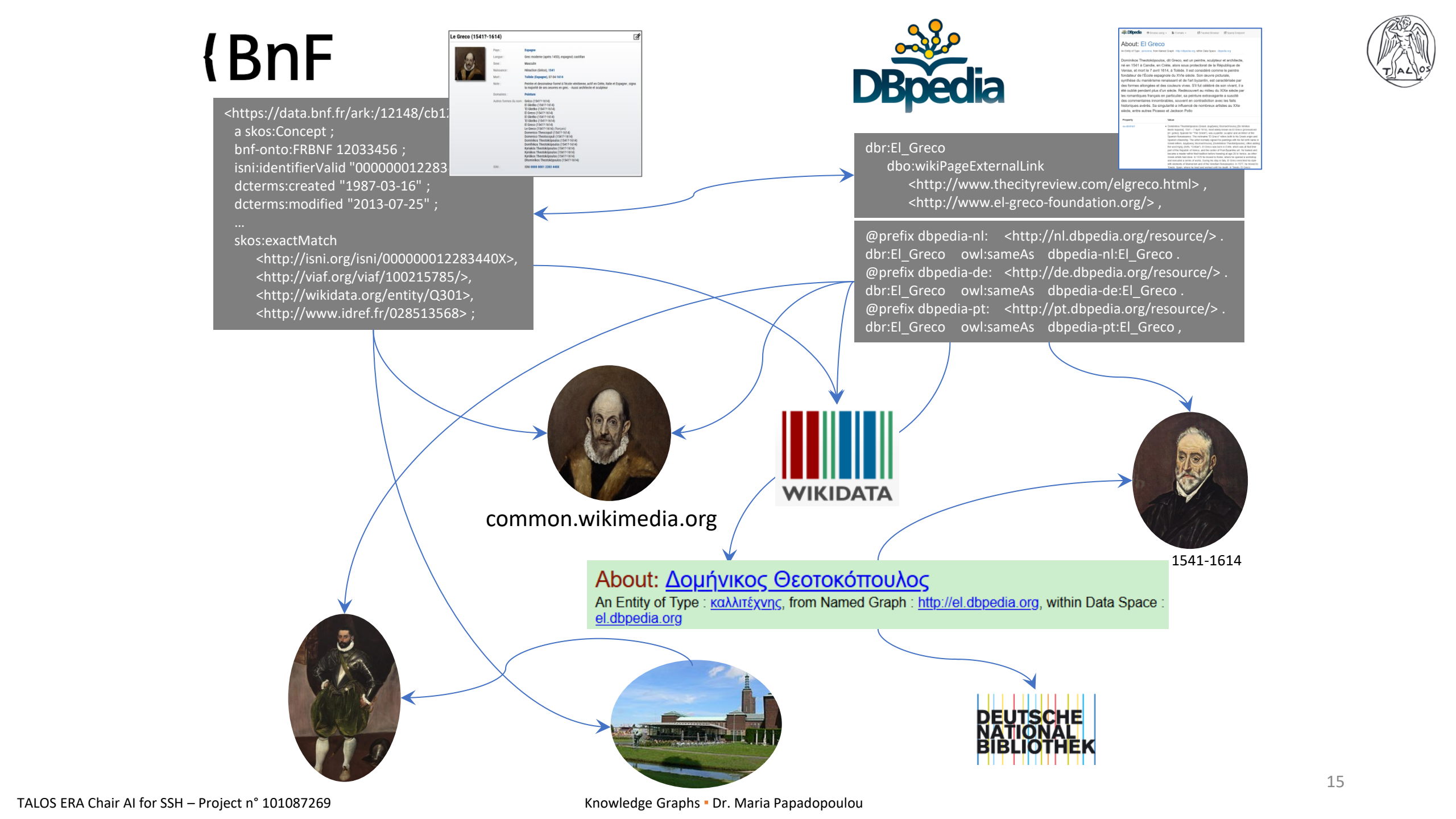
https://prefix.cc/

@prefix foaf: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bnf-onto:FRBNF 12033456 ;
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…
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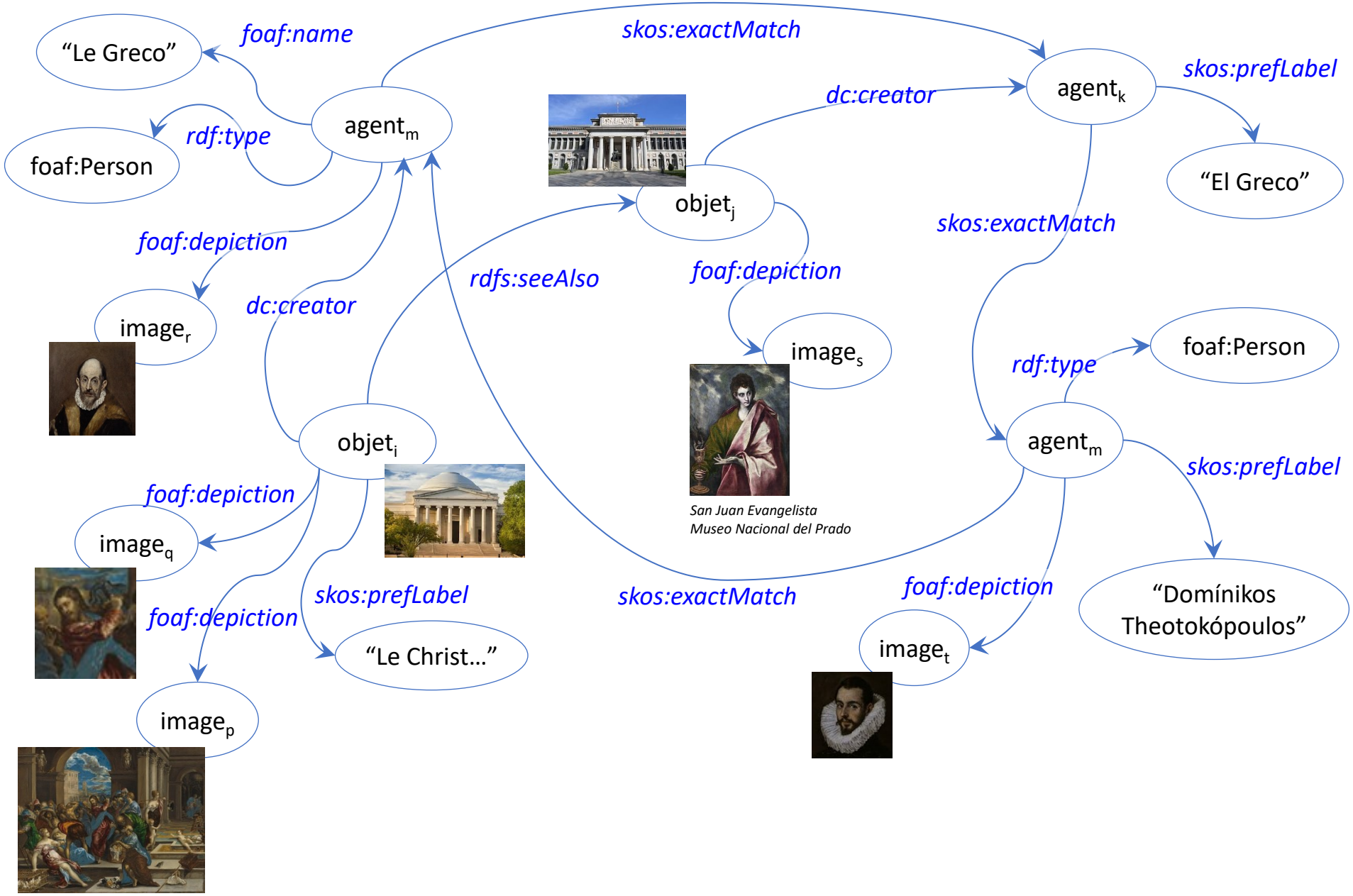
<http://viaf.org/viaf/100215785/>,
<http://wikidata.org/entity/Q301>,
<http://www.idref.fr/028513568> ;
Le Greco (1541?-1614)
DBpedia
About: El Greco
dbr:El_Greco
dbo:wikiPageExternalLink
<http://www.thecityreview.com/elgreco.html> ,
<http://www.el-greco-foundation.org/> ,
@prefix dbpedia-nl: <http://nl.dbpedia.org/resource/> .
dbr:El_Greco owl:sameAs dbpedia-nl:El_Greco .
@prefix dbpedia-de: <http://de.dbpedia.org/resource/> .
dbr:El_Greco owl:sameAs dbpedia-de:El_Greco .
@prefix dbpedia-pt: <http://pt.dbpedia.org/resource/> .
dbr:El_Greco owl:sameAs dbpedia-pt:El_Greco ,
common.wikimedia.org
WIKIDATA
1541-1614
About: Δομήνικος Θεοτοκόπουλος
An Entity of Type : καλλιτέχνης, from Named Graph : http://el.dbpedia.org, within Data Space : el.dbpedia.org
DEUTSCHE NATIONAL BIBLIOTHEK

Example


"Le Greco"
foaf:name
skos:exactMatch
agent_k
skos:prefLabel
rdf:type
agent_m
foaf:Person
dc:creator
"El Greco"
objet_j
foaf:depiction
skos:exactMatch
rdfs:seeAlso
image_r
dc:creator
foaf:depiction
image_s
rdf:type
foaf:Person
objet_i
agent_m
skos:prefLabel
foaf:depiction
image_q
skos:prefLabel
skos:exactMatch
foaf:depiction
"Le Christ…"
"Domínikos Theotokópoulos"
image_t
image_p
San Juan Evangelista
Museo Nacional del Prado
Le Christ chassant les marchands du Temple
Washington, National Gallery of Art