Objects, Process, Context in Time and Space: what we can do with the Europeana Data Model (EDM) - and what we cannot do

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Overview

- What is the EDM? And what it is not!
- Objects and Context modelled in EDM: Examples
- EDM and LoD
- A few words on RDF
- Potential, Problems and Limitations
- DM2E: Embedding the EDM in a Scholarly semantic Graph

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The Europeana Data Model (EDM) ...

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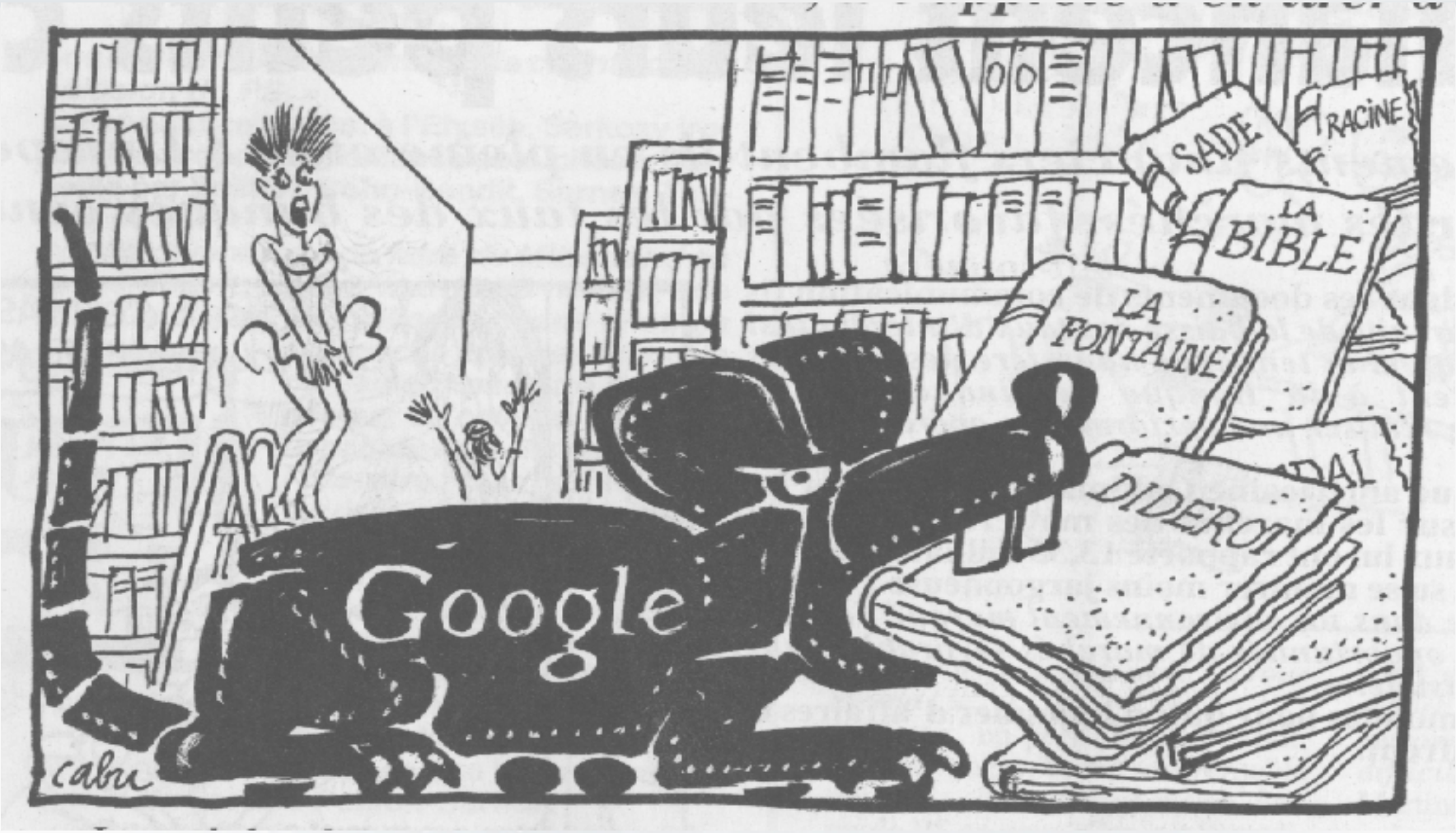
Pre-EDM: 2005



Google Books in 2005 as seen by the Canard Enchainé ...

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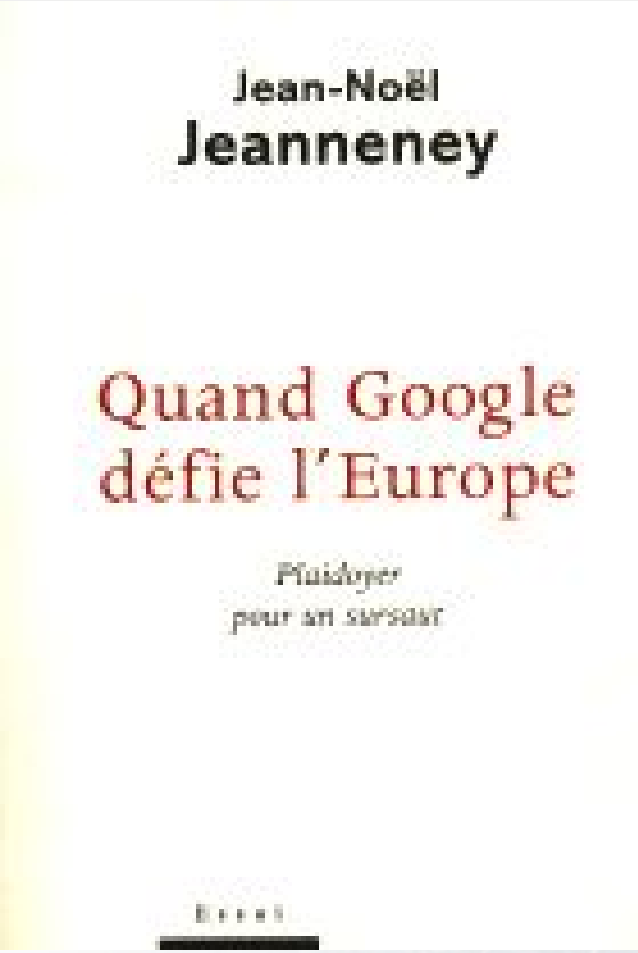
Europeana 2005 - 2011



- … and by Jean-Noel Jeanneney
- → Joint declaration of six European Governments … Chirac and Schröder among those!
- Declaration by Commissioner Reding on the "European Digital Library" flagship as part of i2010.
- Launch (and crash) of a first prototype 20.11.2008
- Constant growth and stable operations since then, > 20 M objects represented to date
- Still basically yet another portal, a big one – but nothing innovative ...

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ESE

"Europeana Semantic Elements" (ESE)

- Created for 2008 version of Europeana
- enforces interoperability by converting datasets to a Dublin-Core like **"flat"** representation
- "simple and robust" but:
  - original metadata is not visible anymore
  - no specializations to finer-grained models
  - no connections to external (open data) resources
- Probably shouldn't have been called "semantic" :-)

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ESE ...


```
<...xmlns:europeana="http://www.europeana.eu/schemas/ese/"
...
<!--National Library of Poland-->
<record>
  <dc:identifier>urn:repox.bn.org.pl:polona:oai:www.polona.pl:4445</dc:identifier>
  <europeana:uri>http://www.europeana.eu/resolve/record/01406/18A8F5DFCAE75694
  A8AAD18E2791861FBE92589A</europeana:uri>
    <dc:title>[Ośmiu powstańców uzbrojonych w kosy]</dc:title>
    <dc:subject>Powstanie 1863 r. styczniowe - ikonografia</dc:subject>
    <dc:date>[1863-1864]</dc:date>
    <dc:rights>Biblioteka Narodowa</dc:rights>
    <europeana:object>http://193.59.172.16/szzz/IsShownBy.do?
  id=6481</europeana:object>
    <europeana:isShownAt>http://193.59.172.16/szzz/ShowStart.do?
  id=6481</europeana:isShownAt>
</record>
```


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EDM – what is it? And what not?

- EDM is the **metadata model** in the course of replacing the ESE …
- … a model for making statements about **digital representations** of cultural heritage objects
- … a model for **contextualising** such representations
- EDM is **not an object model** (but might be combined with object and process models)!
- EDM is an **RDF based graph model**

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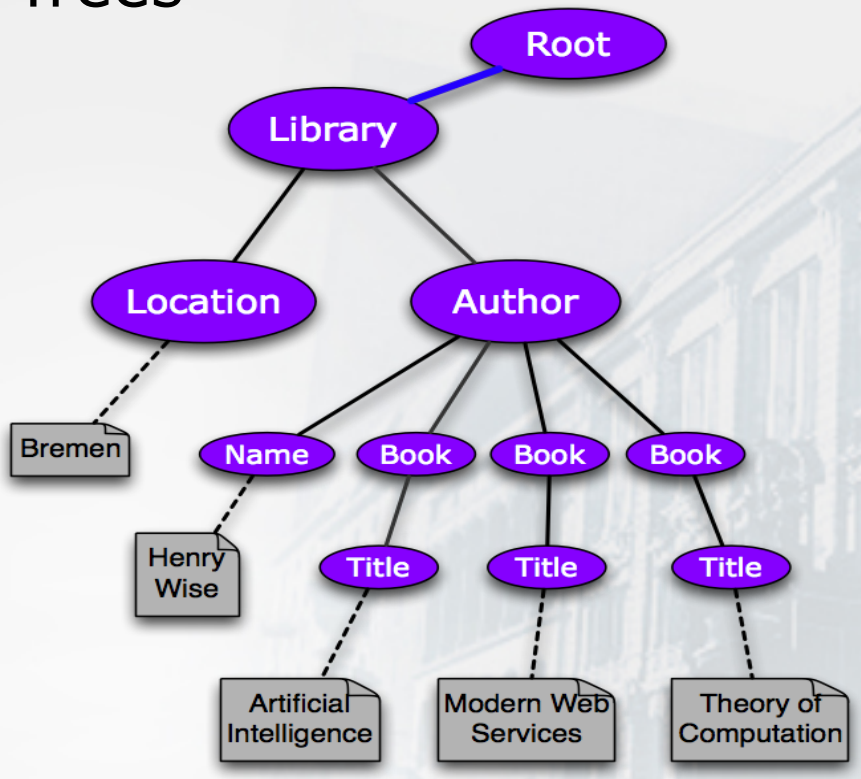
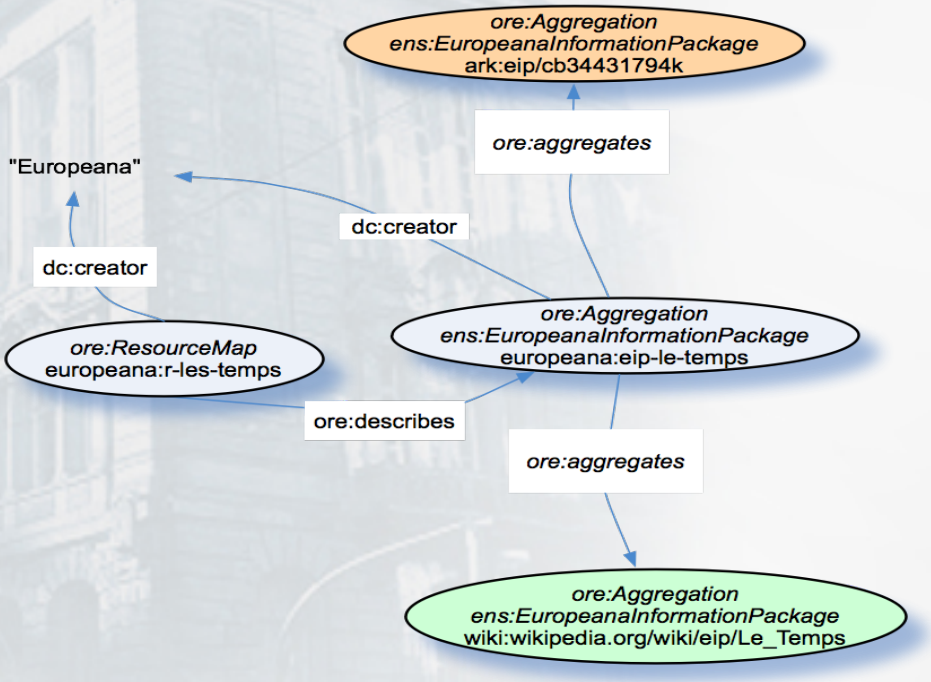
XML vs. RDF:
Trees vs. Graphs, Schema vs. Schema

XML models knowledge as 'Trees'



Schema: Elements & Types
"Validation", prescriptive

RDF models knowledge as graphs



Schema: Classes & Properties, Inheritance, "Inferencing"

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EDM: Requirements and Design Principles

- Distinction of real **object** (book, bicture, file, multimedia object) and its digital **representation**
- Distinction between **object properties** and descriptive **metadata** attributes
- **several perspectives of object** must be possible with potentially contradicting statements
- Support for complex **composite objects**
- **Standard** format for **metadata** with **specializing options**
- **Standard** format for **vocabularies** with **specializing options**
- Maximum **reuse** of existing standards

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EDM and Standards

- Simple Knowledge Organization System (**SKOS**)
  - Models the KOSs in the Semantic Data Layer of Europeana.
  - Allows for matching between KOSs.
- **DCMI** Metadata Terms
  - Used for a core of semantically interoperable properties for descriptive metadata about an object.
  - Ensures backwards compatibility to ESE.
- Open Archives Initiative Object Reuse & Exchange (**OAI ORE**)
  - Organizes the metadata about an object in Europeana:
    - Provided Object: Represents the described object of interest.
    - Digital Representation: Some digital view of the object.
    - Proxy: Description of the provided object from one given perspective.
    - Aggregation: Groups all information pieces together.

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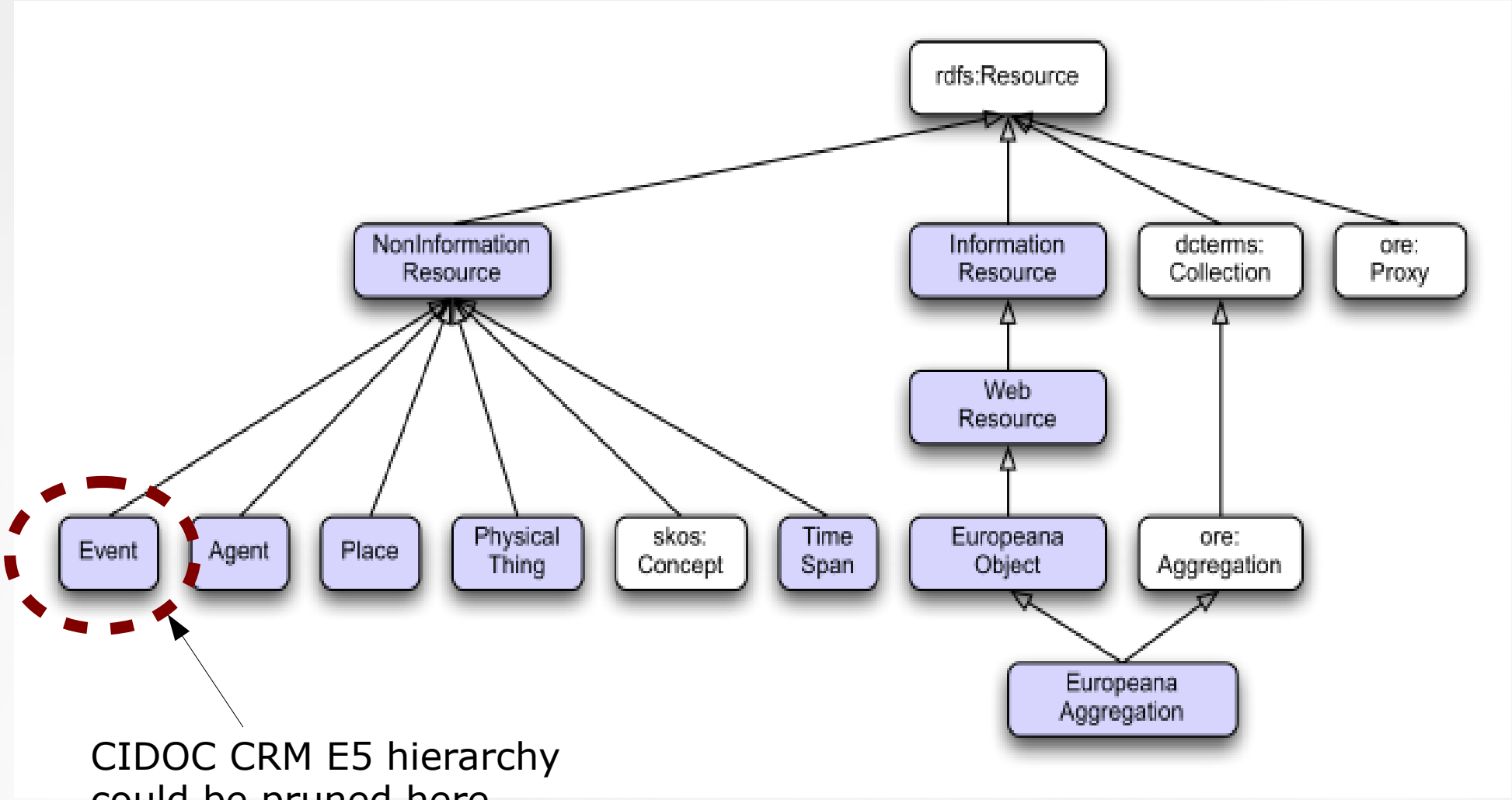
EDM: Classes



CIDOC CRM E5 hierarchy could be pruned here

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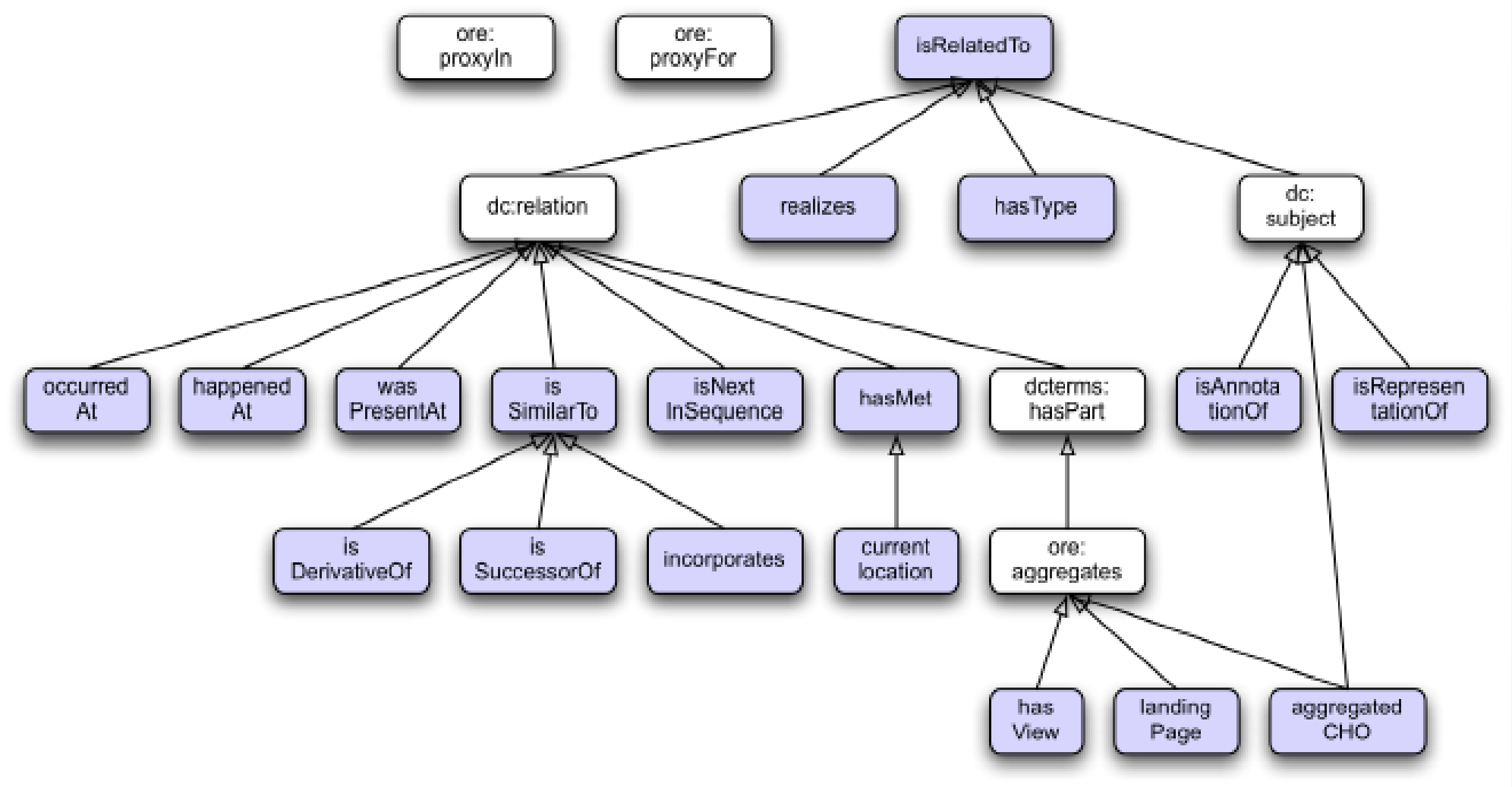
EDM: Properties



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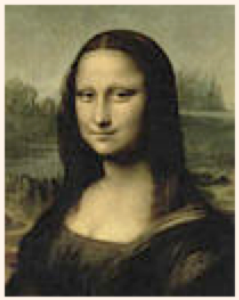
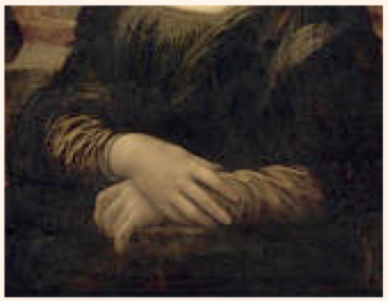
Mona Lisa: French Ministry of Culture

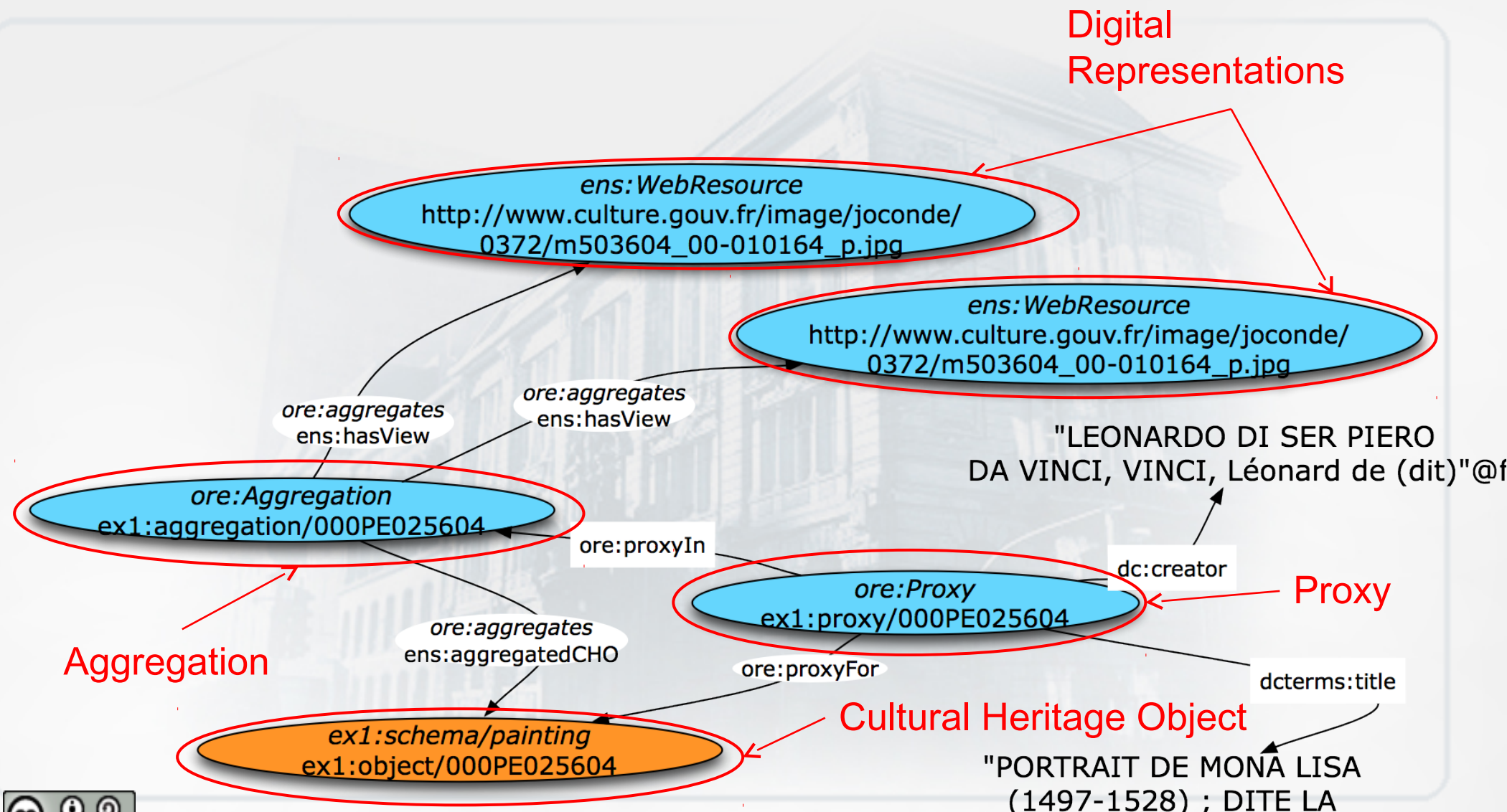
Réponse n° **1**





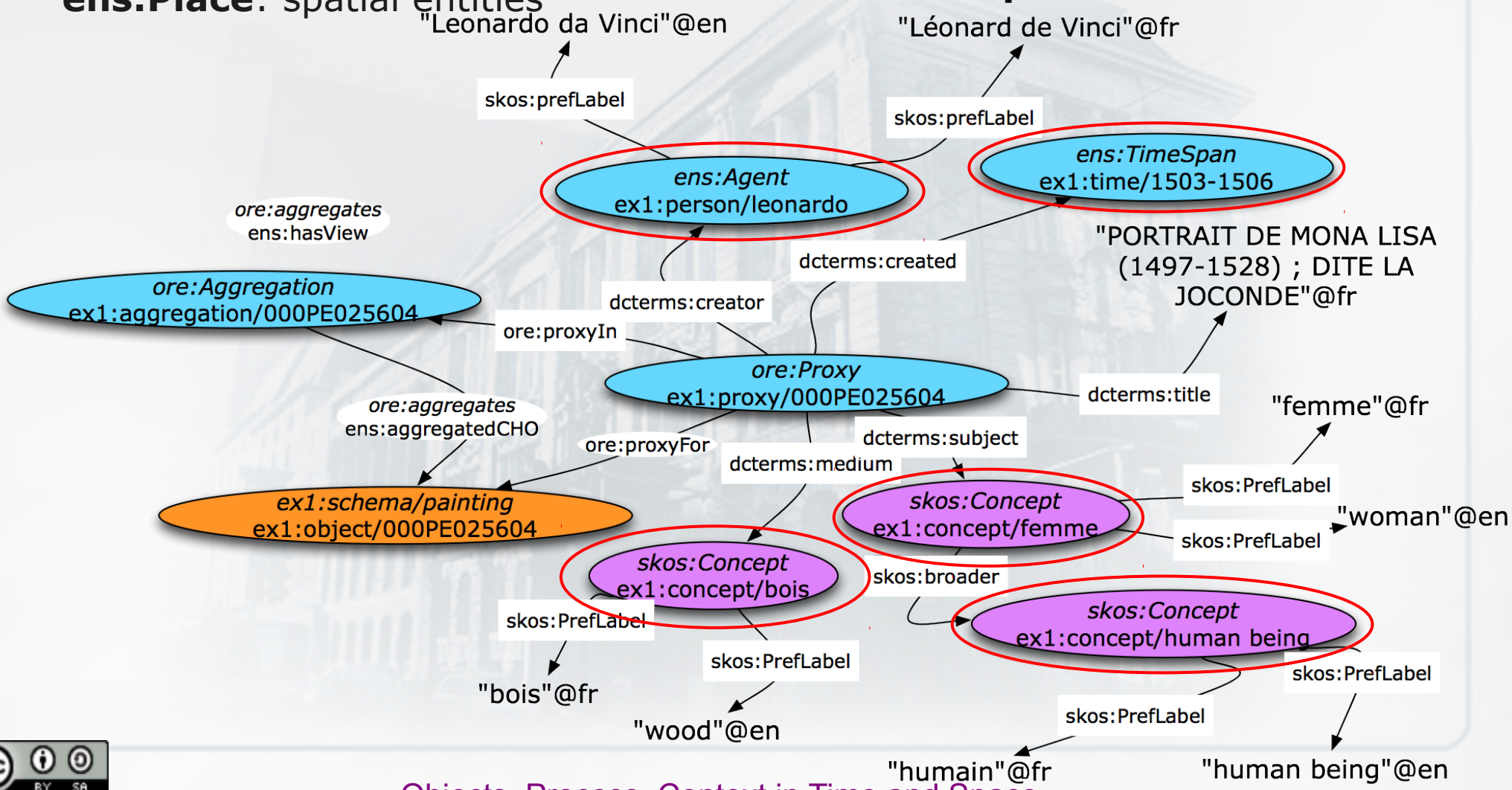
Domaine	peinture
Type d'objet	tableau
Titre	**PORTRAIT DE MONA LISA (1479-1528) ; DITE LA JOCONDE**
Auteur/exécutant	LEONARDO DI SER PIERO DA VINCI ; VINCI Léonard de (dit)
Précision auteur/exécutant	Vinci, 1452 ; Amboise, 1519
Ecole	Italie
Période création/exécution	1er quart 16e siècle
Millésime création/exécution	1503 entre ; 1506 et
Genèse	oeuvre en rapport ; reproduit en gravure
Historique	commandé par le florentin Francesco del Giocondo, époux de Mona Lisa entre 1503 et 1506 ; nombreuses copies dont une conservée au Louvre ; gravé par Fauchery, par Filhol, par Landon
Matériaux/techniques	peinture à l'huile ; bois
Mesures	77 H ; 53 L
Sujet représenté	portrait (Mona Lisa, femme, à mi-corps, de trois-quarts, assis, accoudé, loggia, Italien) ; fond de paysage (montagne, rocher, cours d'eau, pont, plaine, route)
Date sujet représenté	1479-1528
Lieu de conservation	Paris ; musée du Louvre département des Peintures
	Musée de France *au sens de la loi n°2002-5 du 4 janvier 2002*
Statut juridique	propriété de l'Etat ; musée du Louvre département des Peintures
Anciennes appartenances	François Ier ; Couronne de France
Numéro d'inventaire	INV 779
Commentaires	légère diminution du tableau sur les côtés (environ 7 mm) ; acheté vraisemblablement vers 1519, après la mort de l'artiste
Bibliographie	HEYDENRICH 6 ; OTTINO DELLA CHIESA 31 ; VILLOT I 484 ; HAUTECOEUR 1601 ; C.S.I. 1981, P 192
Copyright notice	© Musée du Louvre, © Direction des Musées de France, 1999
Crédits photographiques	© Réunion des musées nationaux ; © Hervé Lewandowski ; © Thierry Le Mage
	commande reproduction et/ou conditions d'utilisation
	renseignements sur le musée
	000PE025604

Metadata Record in EDM



Semantic Enrichment

ens:Agent: persons or organizations
ens:Place: spatial entities
ens:TimeSpan: time periods or dates
skos:Concept: entities from KOS



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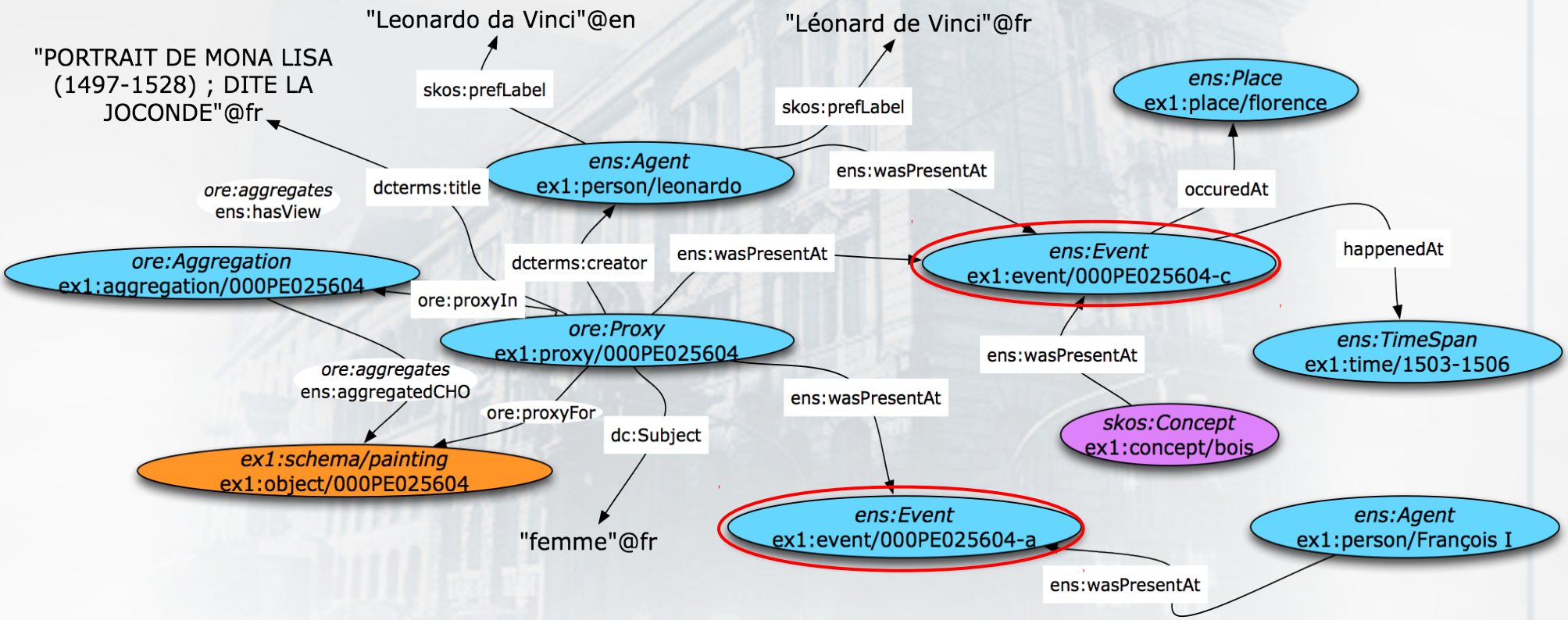
Event-Centric Modeling

Preserving and exploiting original data also means being compatible with descriptions beyond simple object level (→ CIDOC CRM!)



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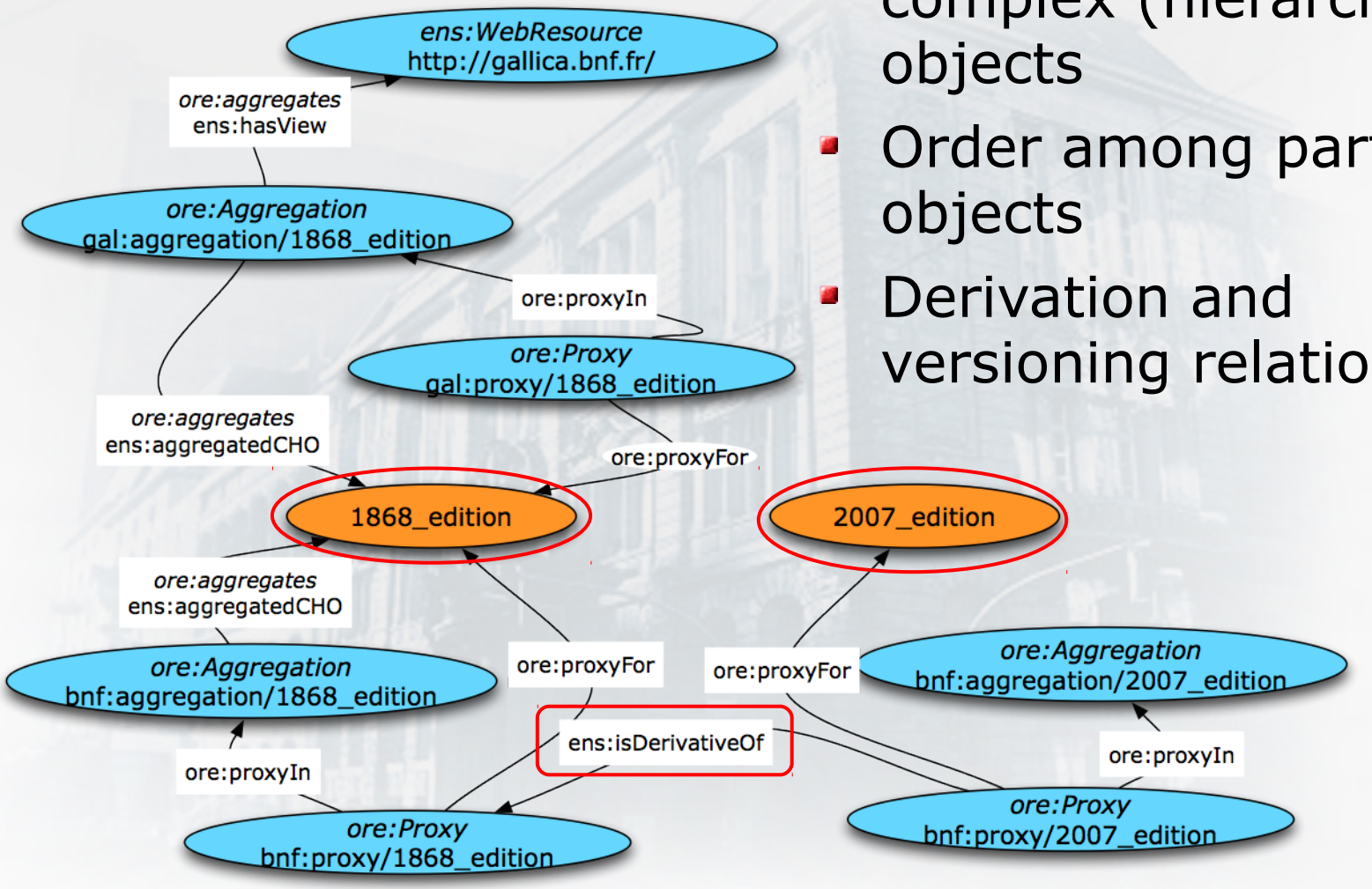
Complex Objects



- Part-whole links for complex (hierarchical) objects
- Order among parts of objects
- Derivation and versioning relations

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Les Fleurs du Mal: UNIMARC

http://catalogue.bnf.fr/ark:/12148/cb37367035f

000 nam 22 450
001FRBNF373670350000003
009http://catalogue.bnf.fr/ark:/12148/cb37367035f
039 $oGEA$a000288182
100 $a19920409d1857 m y0frey50 ba
1010 $afre
102 $aFR
105 $a||||z 00|||
106 $ar
2001 $a^Les ‰fleurs du mal$bTexte imprimé$fpar Charles Baudelaire
210 $aParis$cPoulet-Malassis et De Broise$d1857
215 $a248 p.$d19 cm
676 $a841.8$v22
686 $a840$2Cadre de classement de la Bibliographie nationale française
700 |311890582aBaudelaire$bCharles$4070
801 0aFRbBNF$c19920409$gAFNOR$2intermrc

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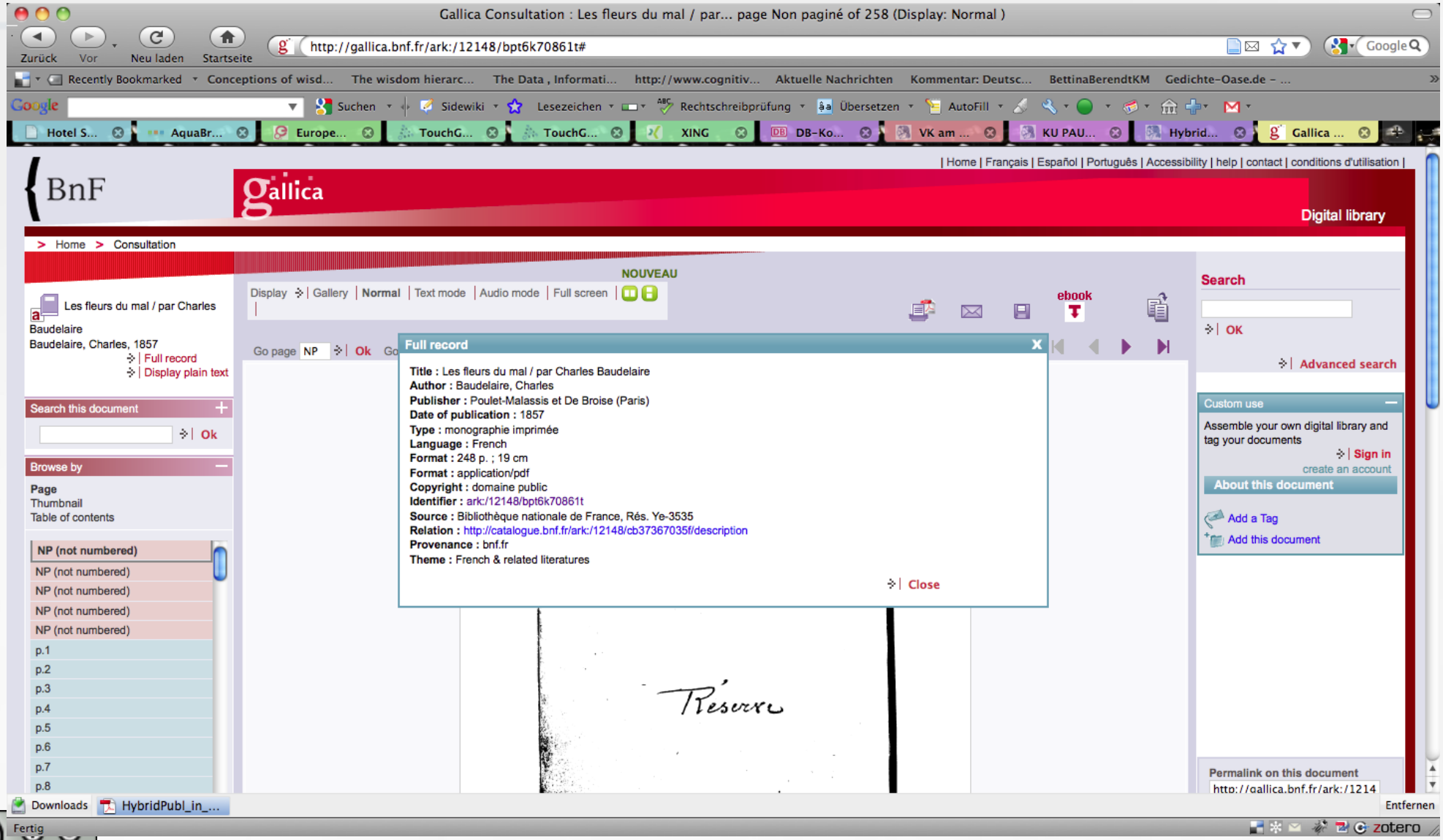
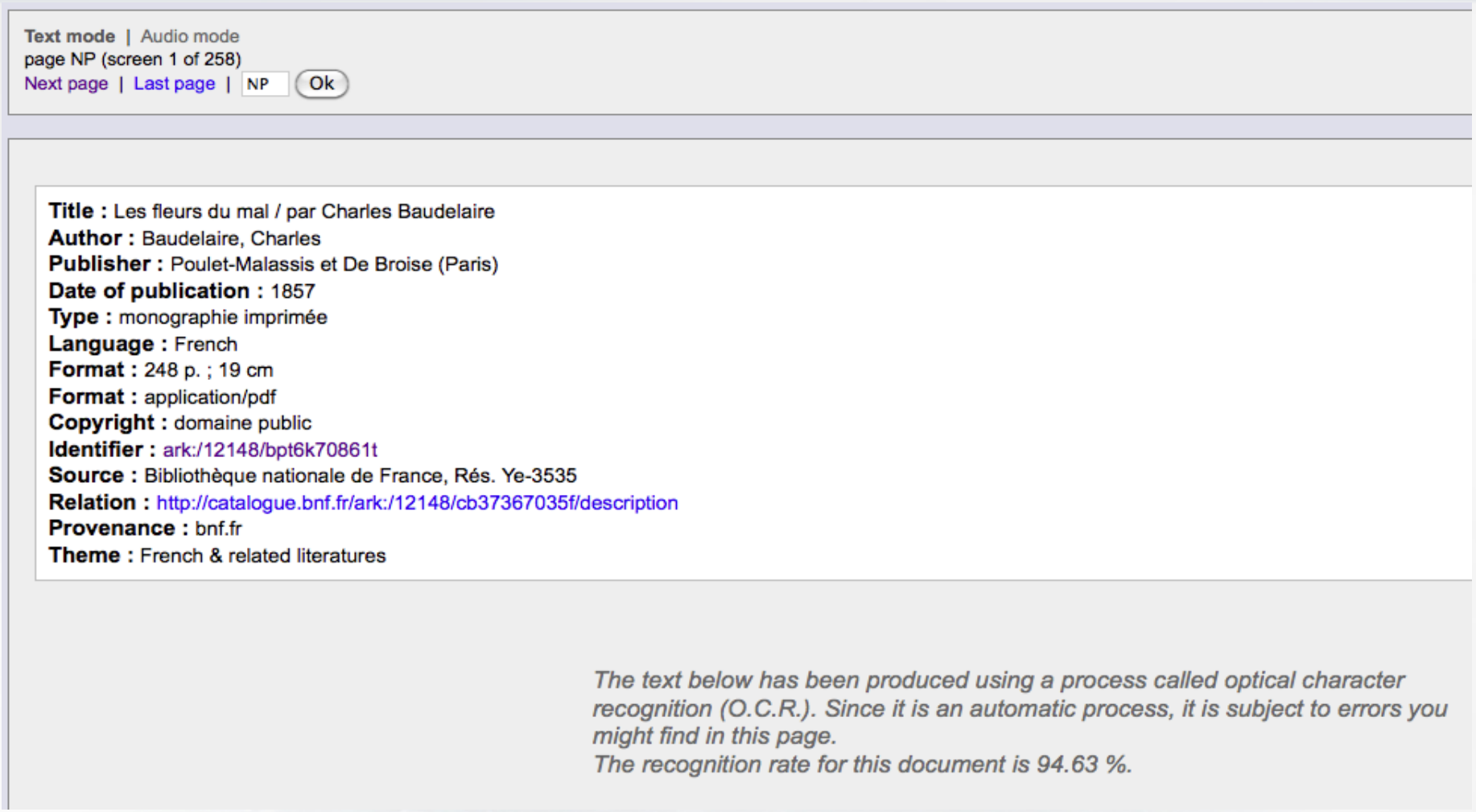
Les Fleurs du Mal: Gallica

http://gallica.bnf.fr/ark:/12148/bpt6k70861t



Les Fleurs du Mal: Digitised

http://gallica.bnf.fr/ark:/12148/bpt6k70861t.textePage.f1



Text mode | Audio mode
page NP (screen 1 of 258)
Next page | Last page | NP Ok

Title : Les fleurs du mal / par Charles Baudelaire
Author : Baudelaire, Charles
Publisher : Poulet-Malassis et De Broise (Paris)
Date of publication : 1857
Type : monographie imprimée
Language : French
Format : 248 p. ; 19 cm
Format : application/pdf
Copyright : domaine public
Identifier : ark:/12148/bpt6k70861t
Source : Bibliothèque nationale de France, Rés. Ye-3535
Relation : http://catalogue.bnf.fr/ark:/12148/cb37367035f/description
Provenance : bnf.fr
Theme : French & related literatures

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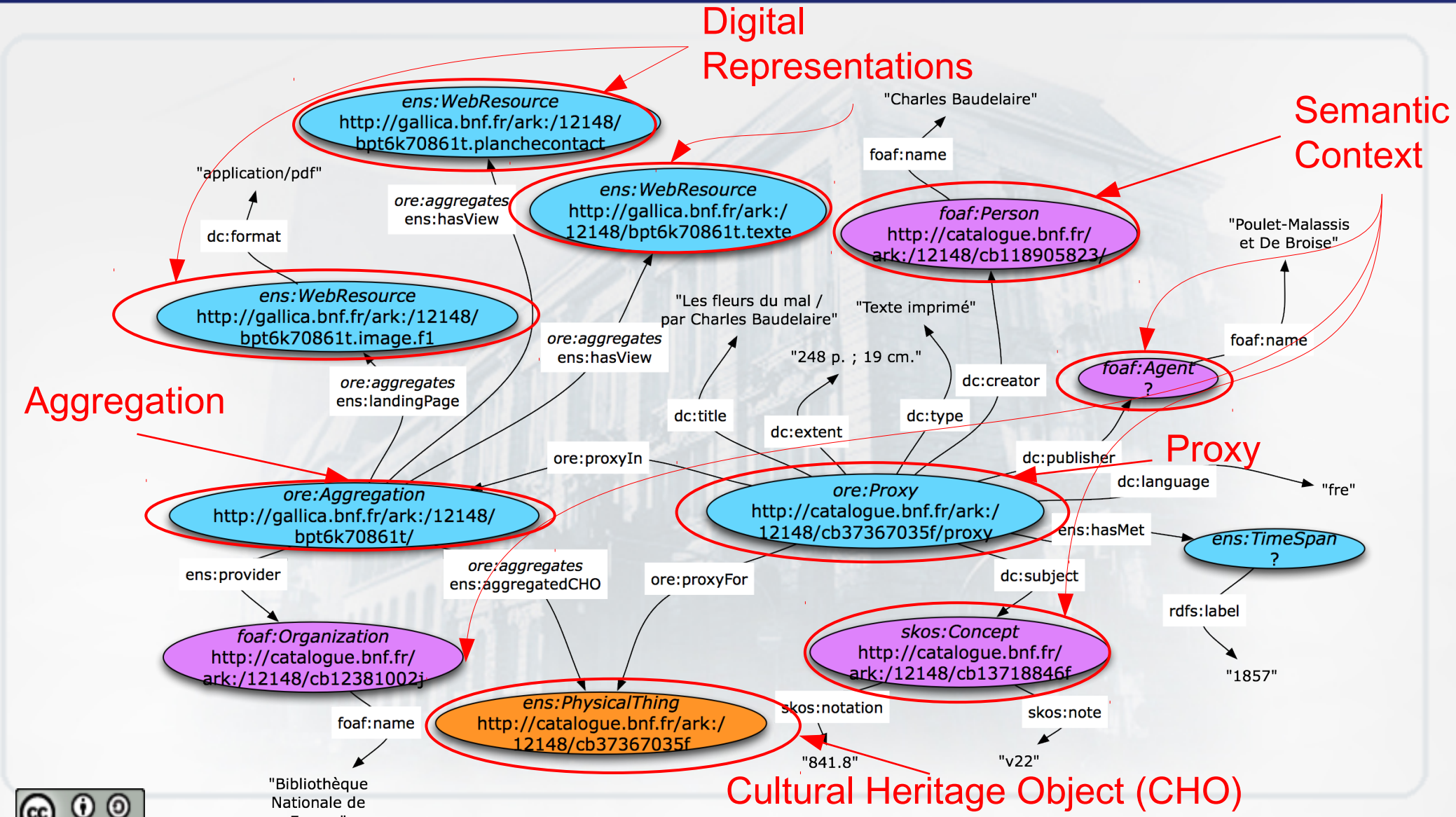
Les Fleurs du Mal: EDM



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Current State of EDM

- Confirmed feasibility in community workshops (archives, libraries, audiovisual archives, museums)
- EDM is already deployed in the Europeana Linked open Data pilot at data.europeana.eu
- EDM Specifications and Primer
  - http://www.pro.europeana.eu/web/guest/edm-documentation
- Martin Doerr, Stefan Gradmann, Steffen Hennicke, Antoine Isaac, Carlo Meghini, Herbert van de Sompel: The Europeana Data Model. IFLA 2010 (Gothenburg).
  - http://www.ifla.org/files/hq/papers/ifla76/149-doerr-en.pdf
- Development documentation + Ontology @ EuropeanaLabs:
  - http://europeanalabs.eu/

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… and LoD: into contextualisation

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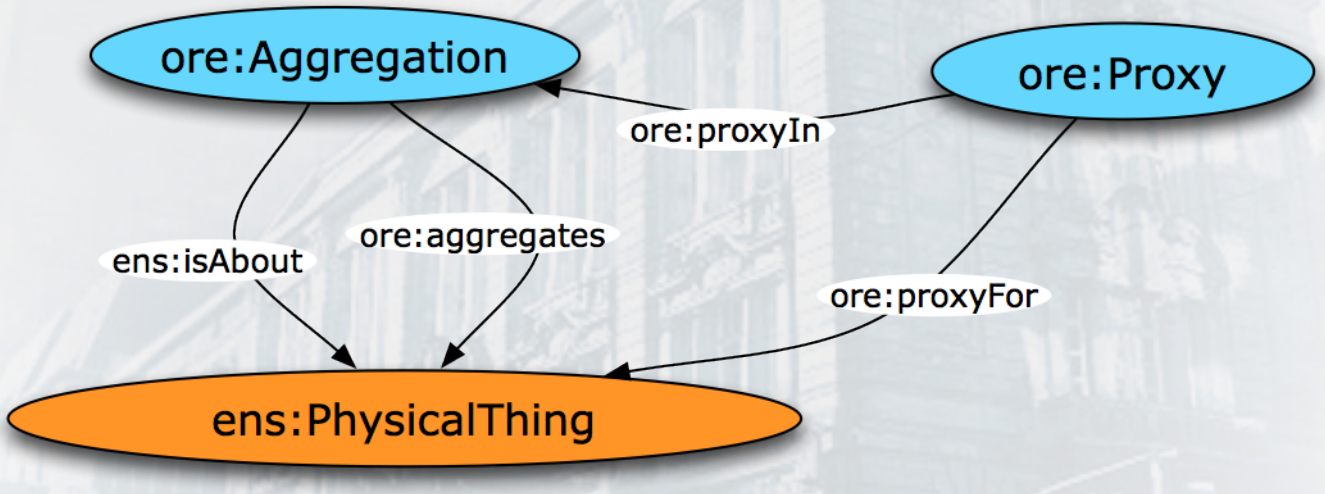
An Aggregation ...



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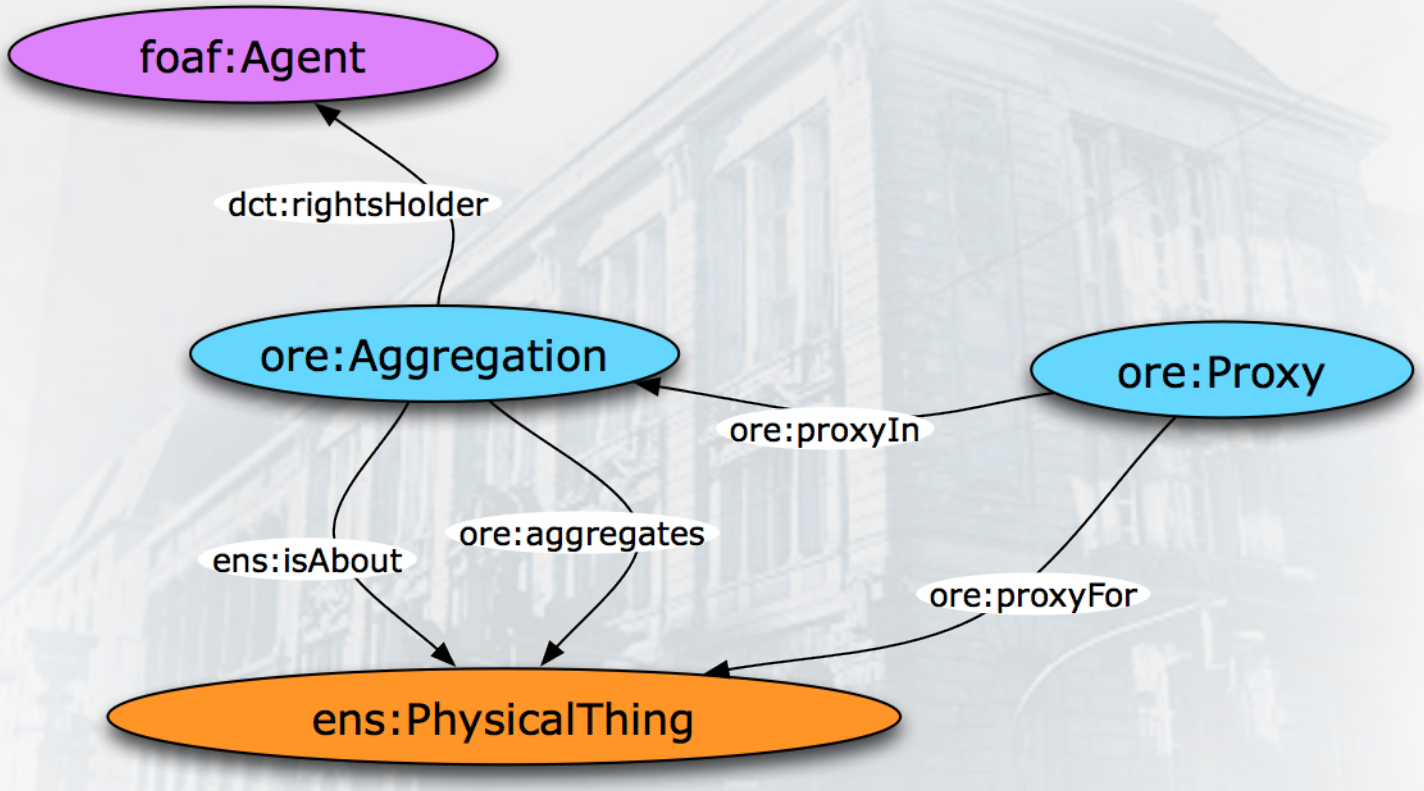
… some context



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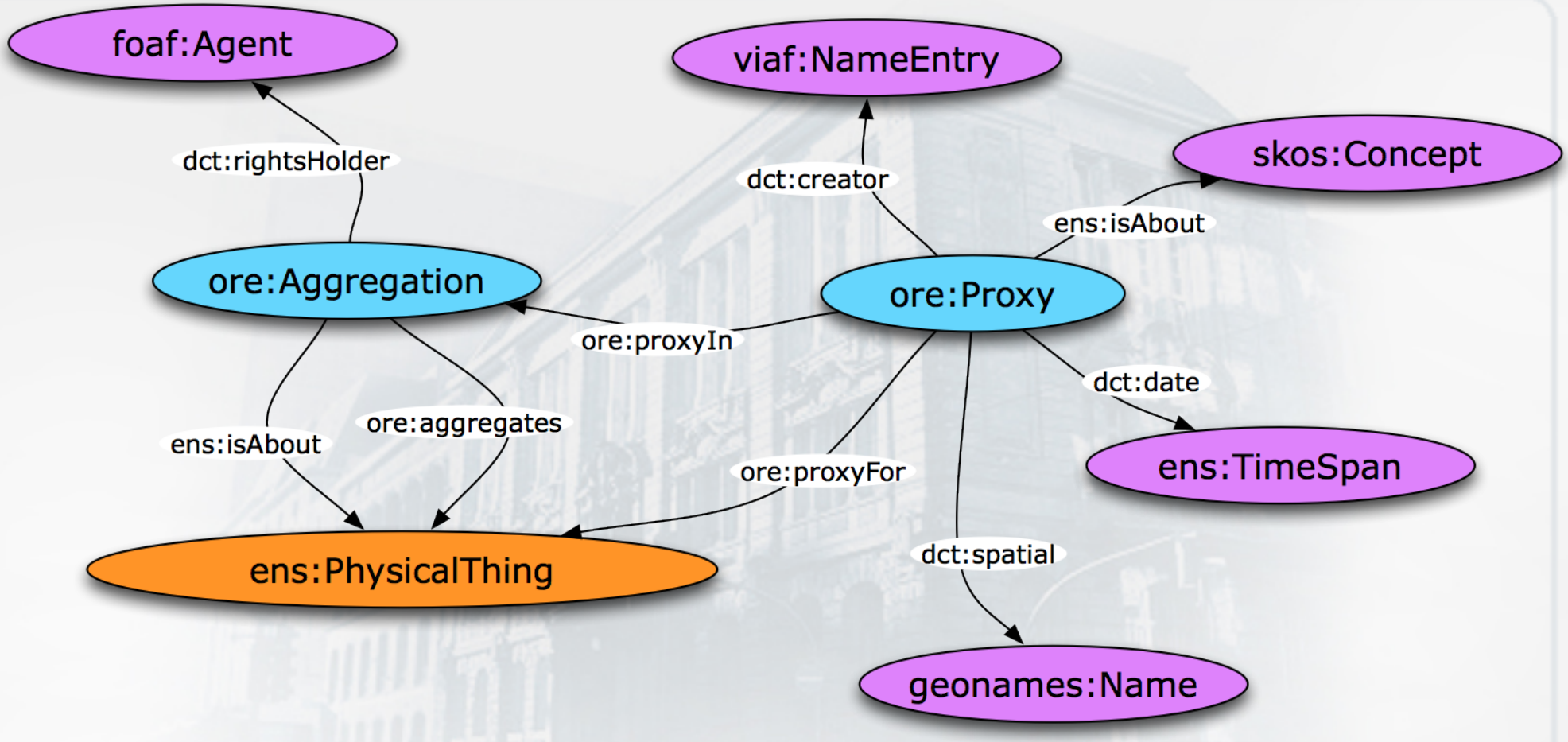
… more context



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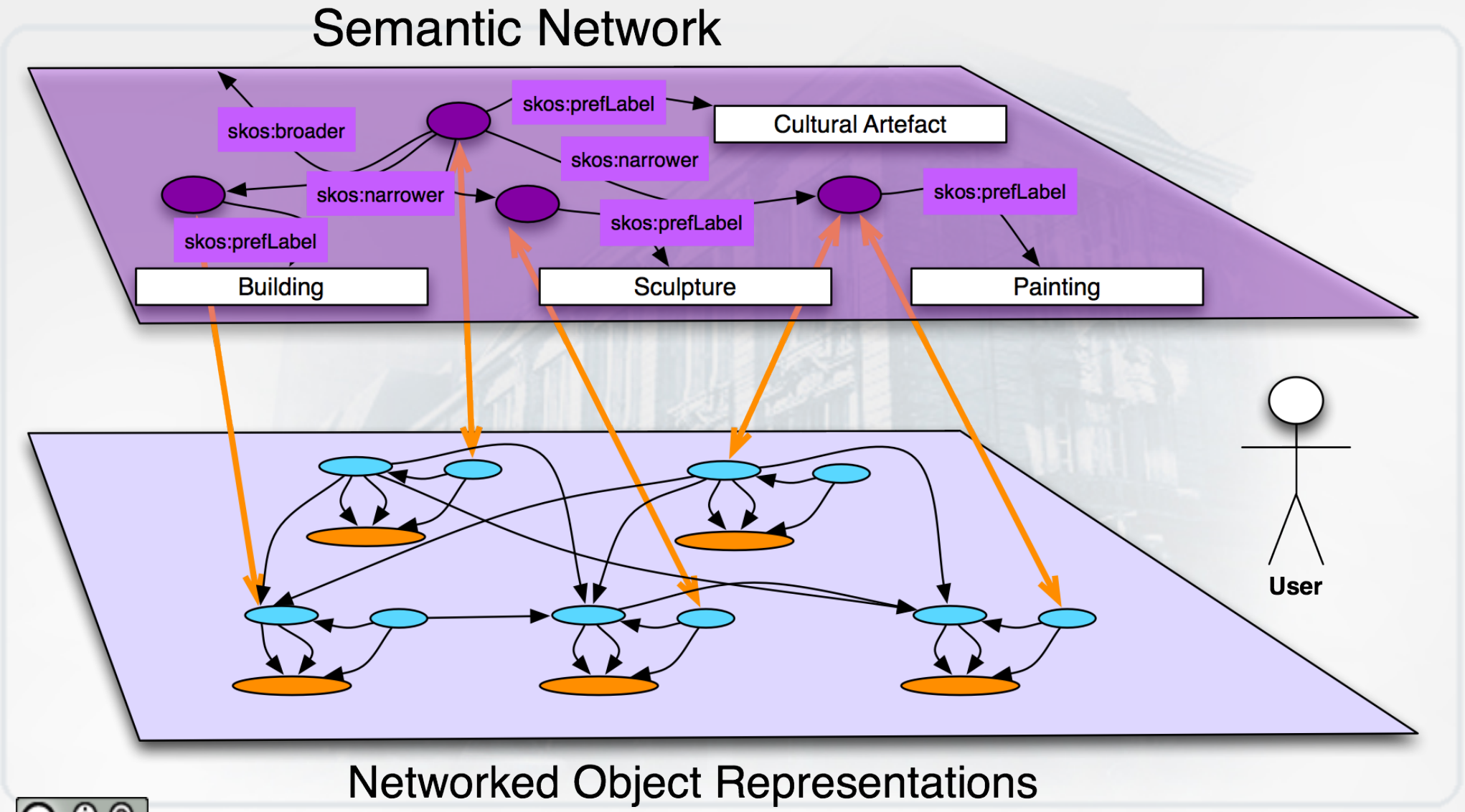
… and the Big Picture: The Semantic Data Layer



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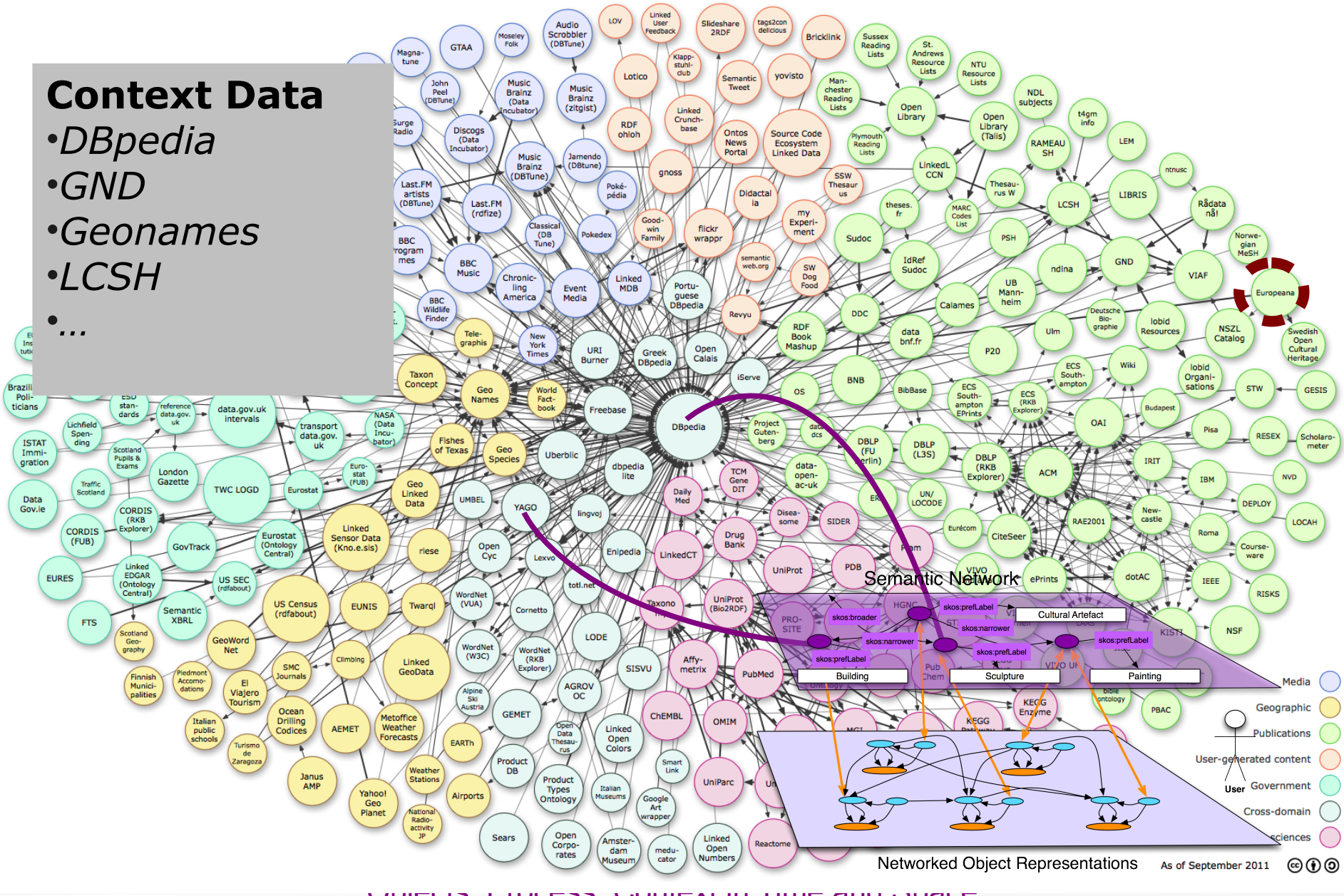
EDM and Linked Open Data

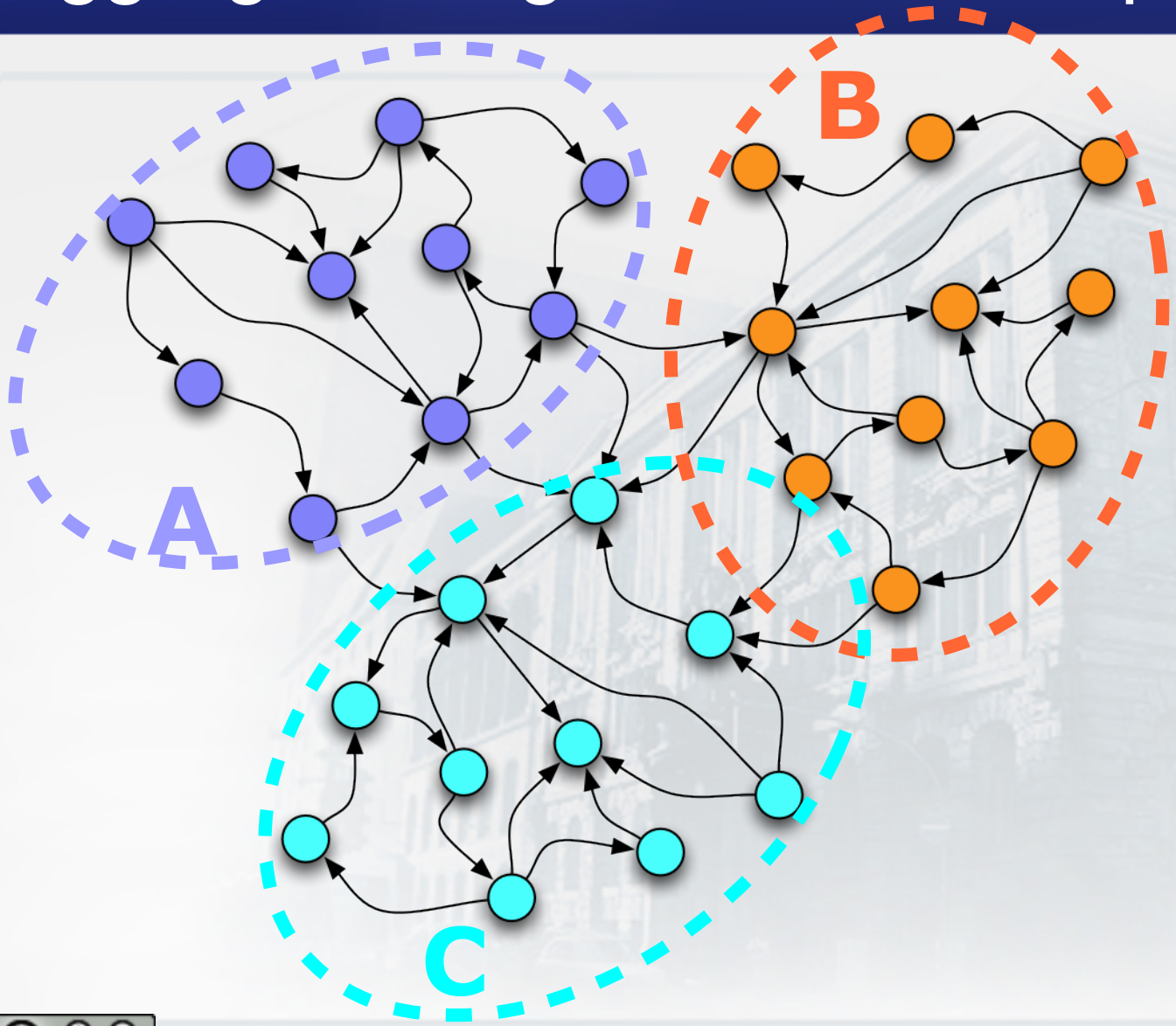
Context Data

- *DBpedia*
- *GND*
- *Geonames*
- *LCSH*
- *...*



Objects, Process, Context in Time and Space

Modelling Object Representations as RDF Aggregations generates new questions ...



- Where do resource aggregations 'start'? Where do they 'end'?
- And what constitutes document boundaries??
- And which node was connected to which one at a given time???

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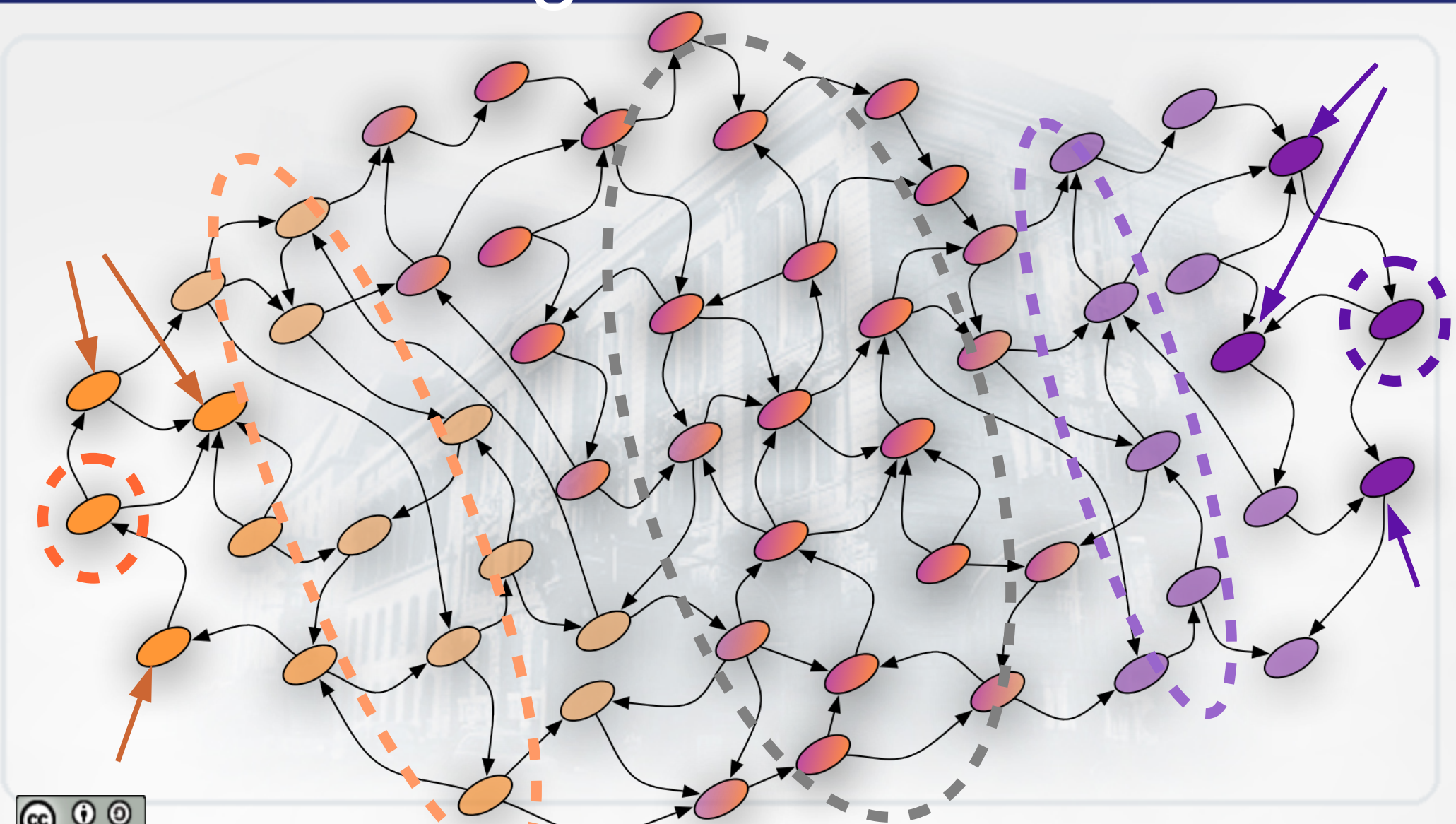
Aggregations and Context: Calculating Closeness



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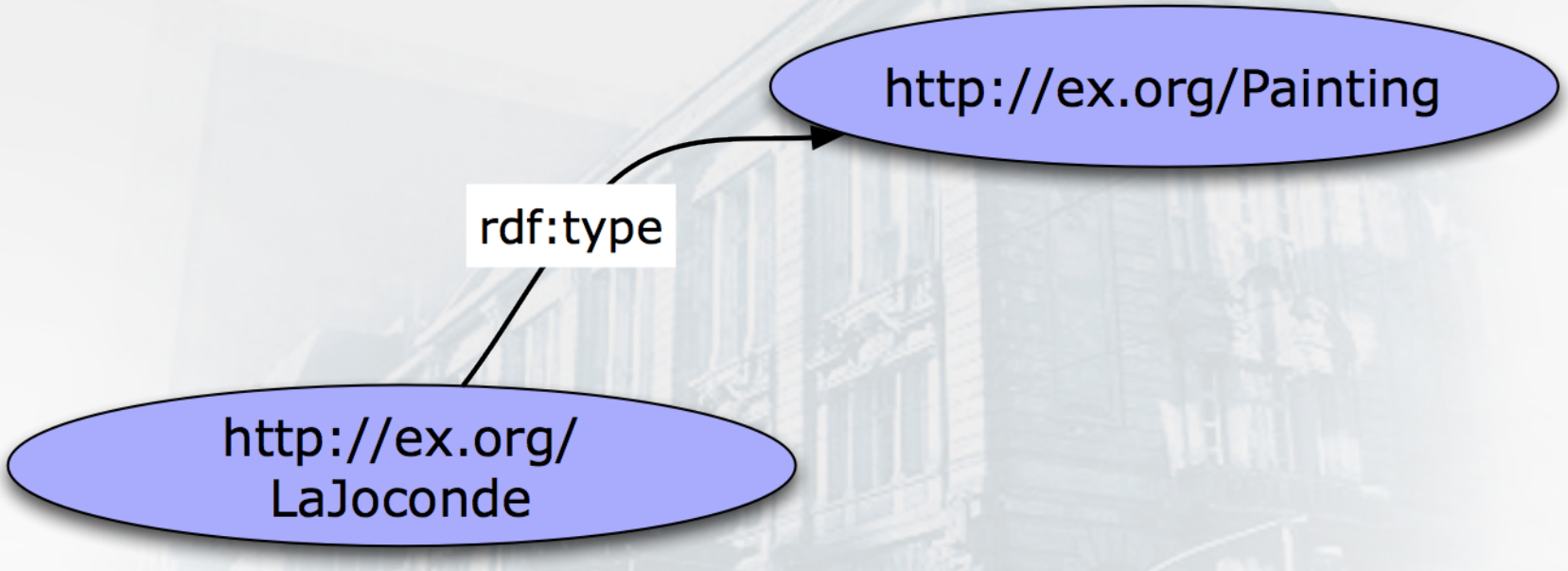
… and new opportunities: Triple Sets and Reasoning (1)



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Triple Sets and Reasoning (2)

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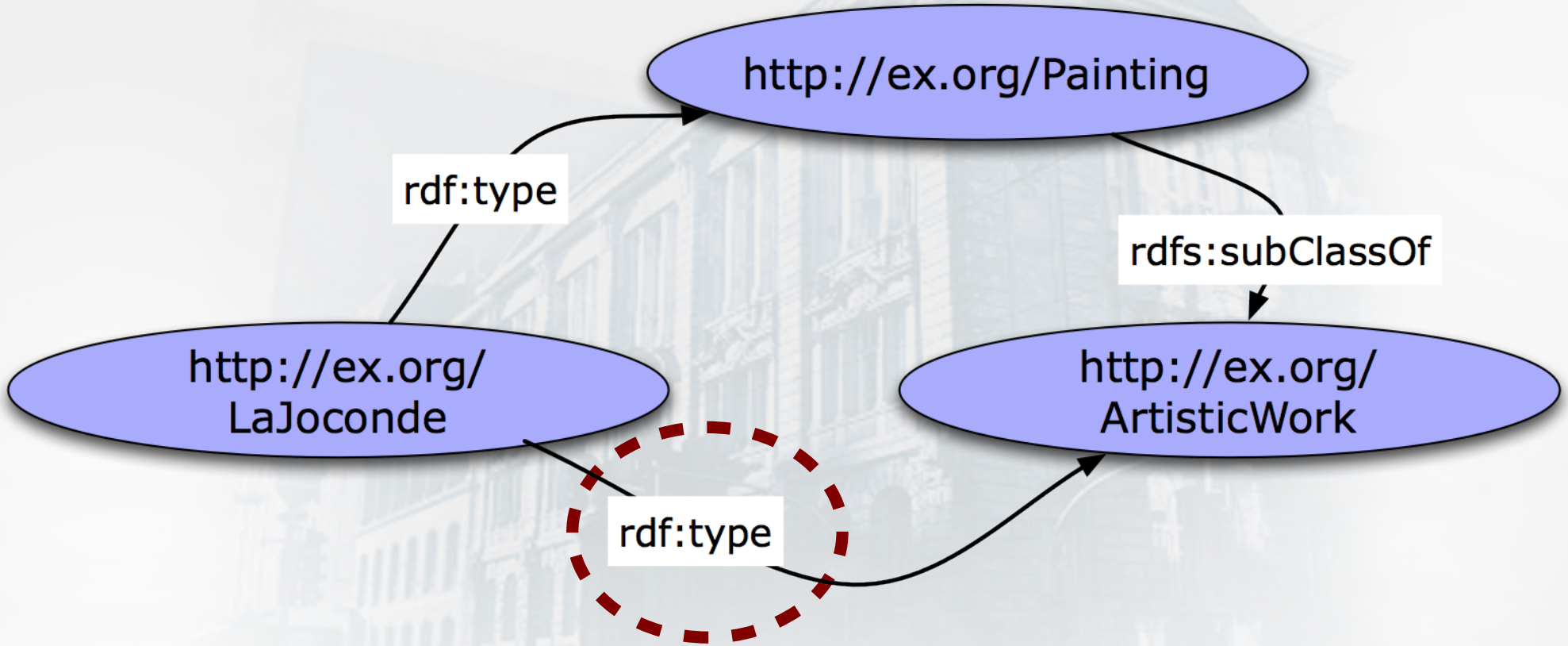
Triple Sets and Reasoning (3)



→ simple, deterministic 'reasoning' may have some potential of enabling novel digital heuristics!

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… and shares the more general pros and cons of RDF

- **Pros**: Simple, lightweight, robust, atomistic and scalable
- Limitations of triple syntax and problems of expressing
  - provenance
  - versioning
- Hence W3C work on 'Named Graphs' to **avoid systematic reification**
- How to deal with '**similarity**' and '**ambiguity**'?
- Lacking support for complex signification modes **beyond mere denotation**
- … and the **data quality issues** of the LoD cloud

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→ **WP3 experiment**

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Digitised Manuscripts to Europeana (DM2E): What?

- WP1: Provide substantial amounts of **digital content** to Europeana with a focus on **digitised manuscripts**
- WP2: Integrate existing **technical building blocks**
  - from Europeana development
  - as well as from generic LoD oriented development
  - into a **generic production chain** for migrating data from various sources to the EDM as well
  - as and for the **contextualisation** of the object representations.
- WP3: Explore usage scenarios of such content in a specialised platform for **humanities research** generating digital heuristics and making data as well as heuristics available to specialised visualisation or reasoning environments.

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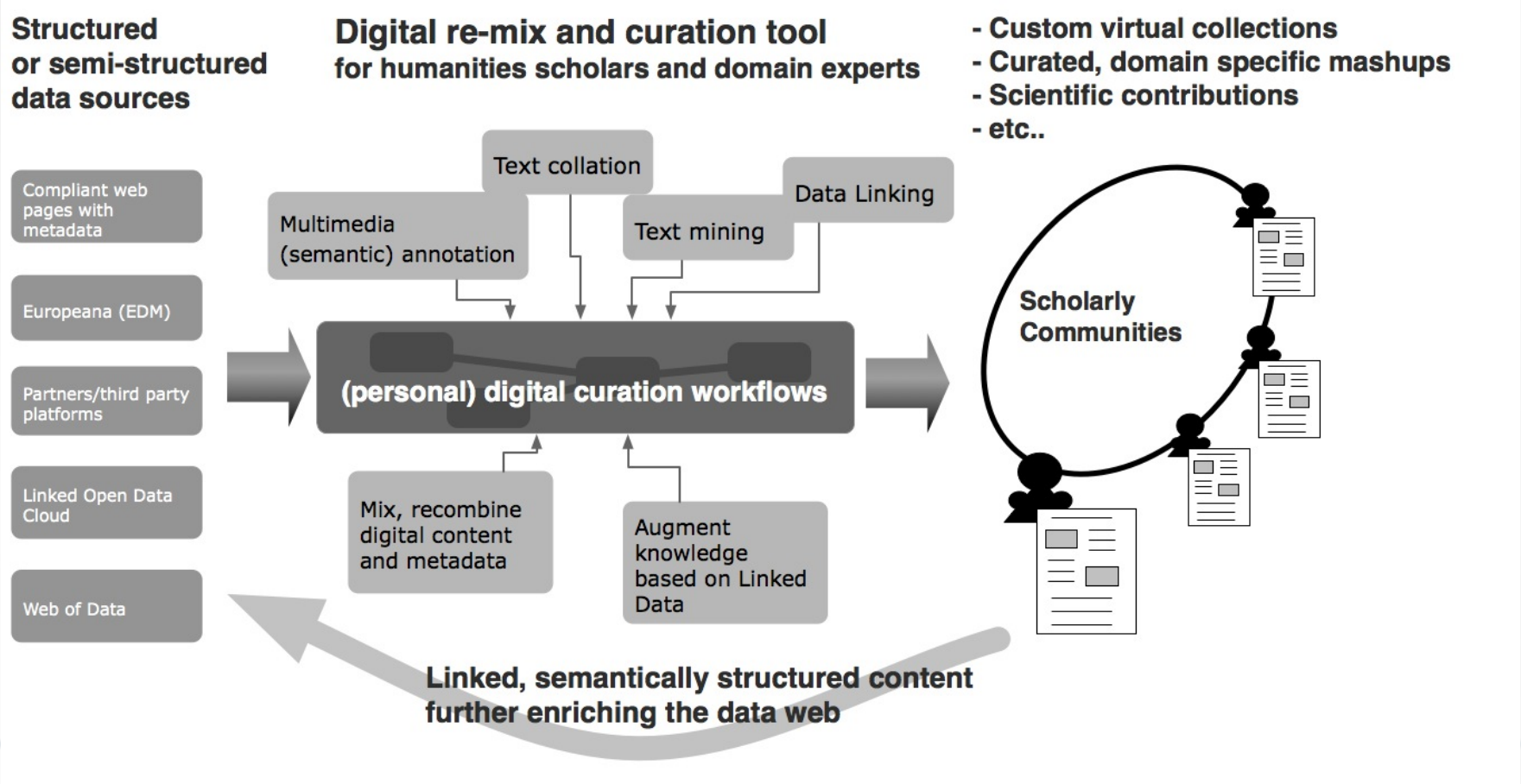
WP3: Digital Humanities Related Engineering

Goal: lower the barriers for **digital content curation** by providing an integrated, flexible, semantic based environment targeted to **digital humanities scholars**



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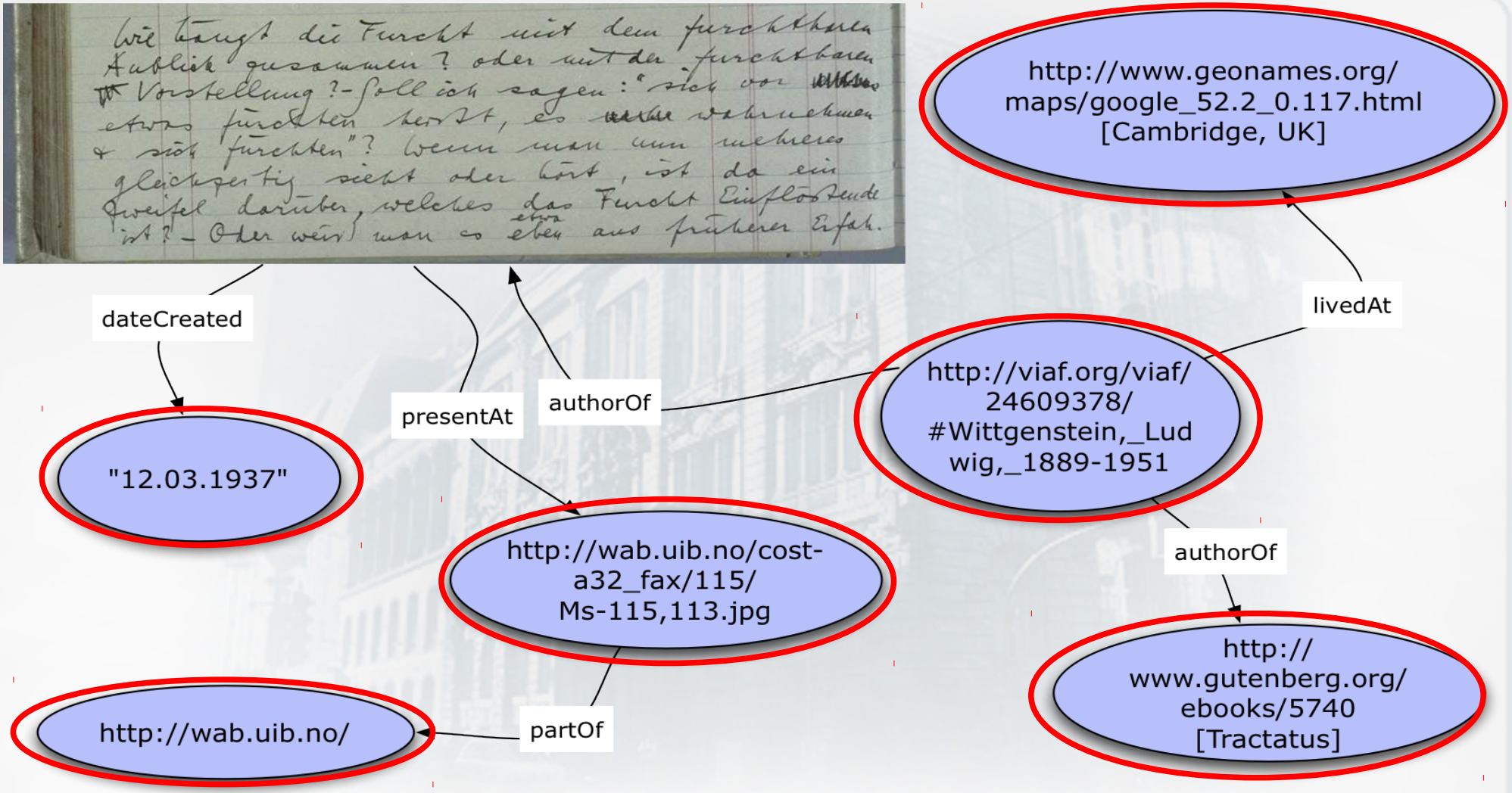
Contextualisation



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Digital Humanities Functionality (WP3)

- Can we enable **digital scholarship** building on combined EDM metadata and digital surrogates ...
- … building on an ontological, granular representation of John Unsworth's **scholarly primitives** (or their successors according to Blanke/Hedges 2011)?
- And what is the use of the resulting increasingly complex **social semantic scholarly graph** that extends the EDM data with RDF statements such as
  - Version_A – isSuccessorOf – Version_B
  - Scribe_Y – copiedFrom – Scribe_Z
  - Statement_1 – contradicts - Statement_2
- → what do you **obtain** from on inferencing on this graph …
- → and which are the **limitations** of such an approach?

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Selected Reading

- Martin Doerr, Stefan Gradmann, Steffen Hennicke, Antoine Isaac, Carlo Meghini, Herbert van de Sompel (2010): The Europeana Data Model. IFLA 2010 (Gothenburg). Session on „Libraries and the Semantic Web". http://www.ifla.org/files/hq/papers/ifla76/149-doerr-en.pdf
- Stefan Gradmann (2010): Knowledge = Information in Context: on the Importance of Semantic Contextualisation in Europeana. Europeana White Paper 1. http://www.scribd.com/doc/32110457/Europeana-White-Paper-1
- John Unsworth (2000): Scholarly Primitives. What methods do humanities researchers have in common, and how might our tools reflect this? In the seminar on Humanities Computing, King's College, London. http://www3.isrl.illinois.edu/~unsworth/Kings.5-00/primitives.html
- Tobias Blanke, Mark Hedges (2011): Scholarly primitives. Building institutional infrastructure for humanities e-Science. Future Generation Computer Systems, Available online 13 July 2011, http://www.sciencedirect.com/science/article/pii/S0167739X11001178

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Thank you!

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