

How, When, and Why to use Linked Data

Starting and Sustaining an Institutional Conversation

Museums and the Web: 8 April 2015



Design for Context

Making software applications and web sites easy to use
www.designforcontext.com

Duane Degler

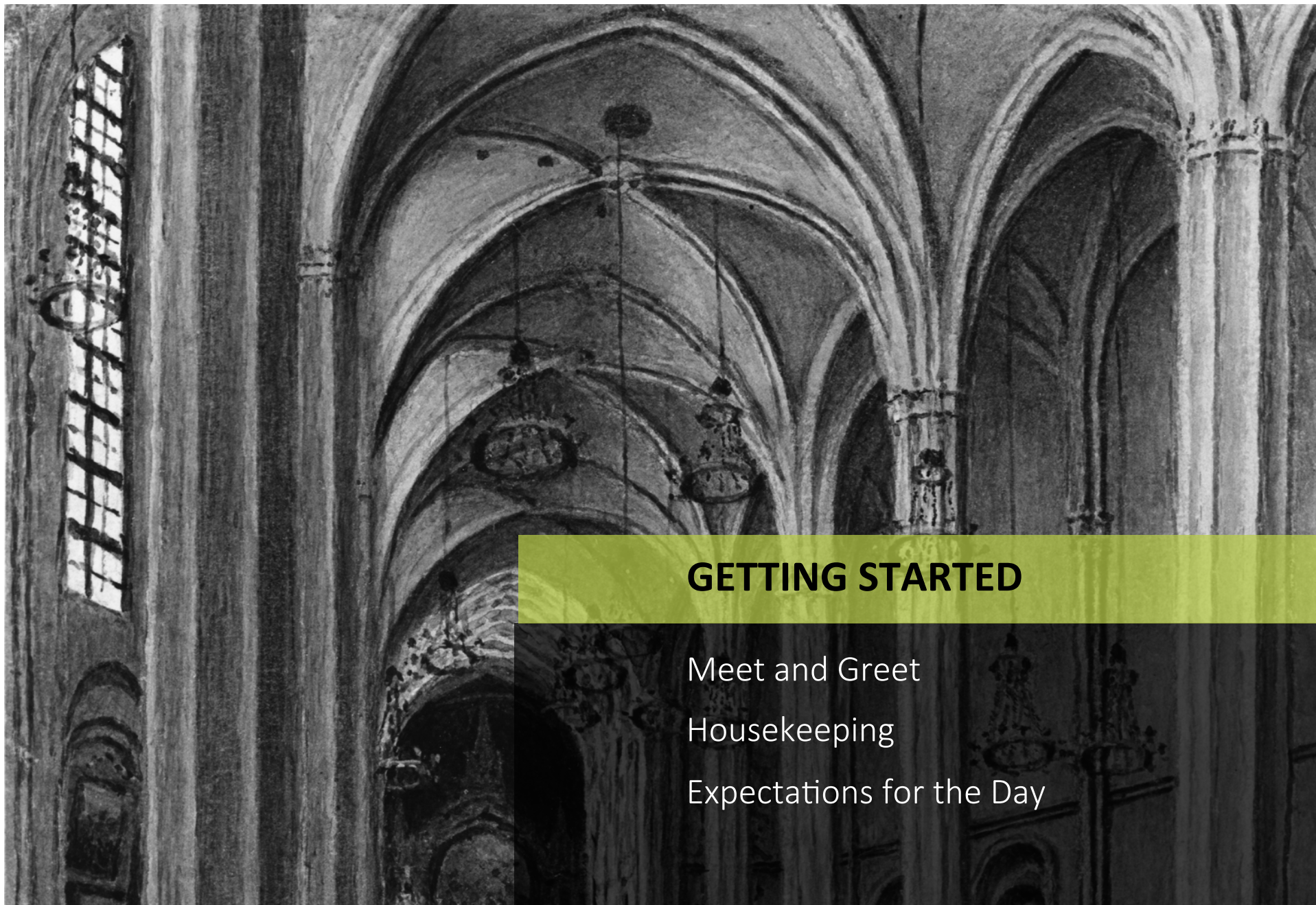
🐦 @ddegler

✉ duane@designforcontext.com

Neal Johnson

🐦 @vanWinkleTunes

✉ neal@designforcontext.com



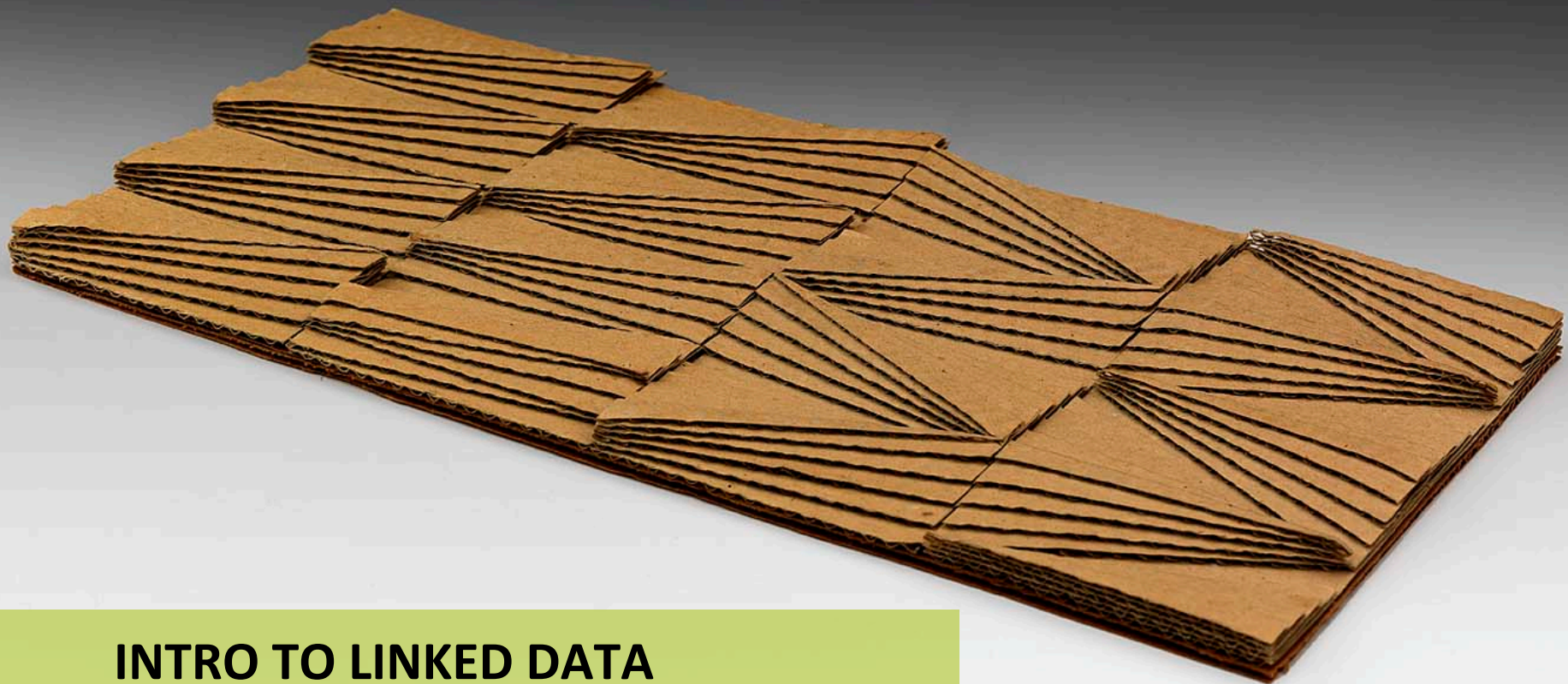
GETTING STARTED

Meet and Greet

Housekeeping

Expectations for the Day

Jakob Alt, "Interior of a Gothic Church", 1864, The Walters Art Museum <http://bit.ly/1wQpaiu>



INTRO TO LINKED DATA

Why should we care about Linked Data?

The Magic of “Triples”

Semantic Infrastructure

Building Semantic Graphs to do Cool Stuff

Athena Tacha, “Maquette for Ripples”, 1979, Smithsonian American Art Museum <http://americanart.si.edu/collections/search/artwork/?id=23595>

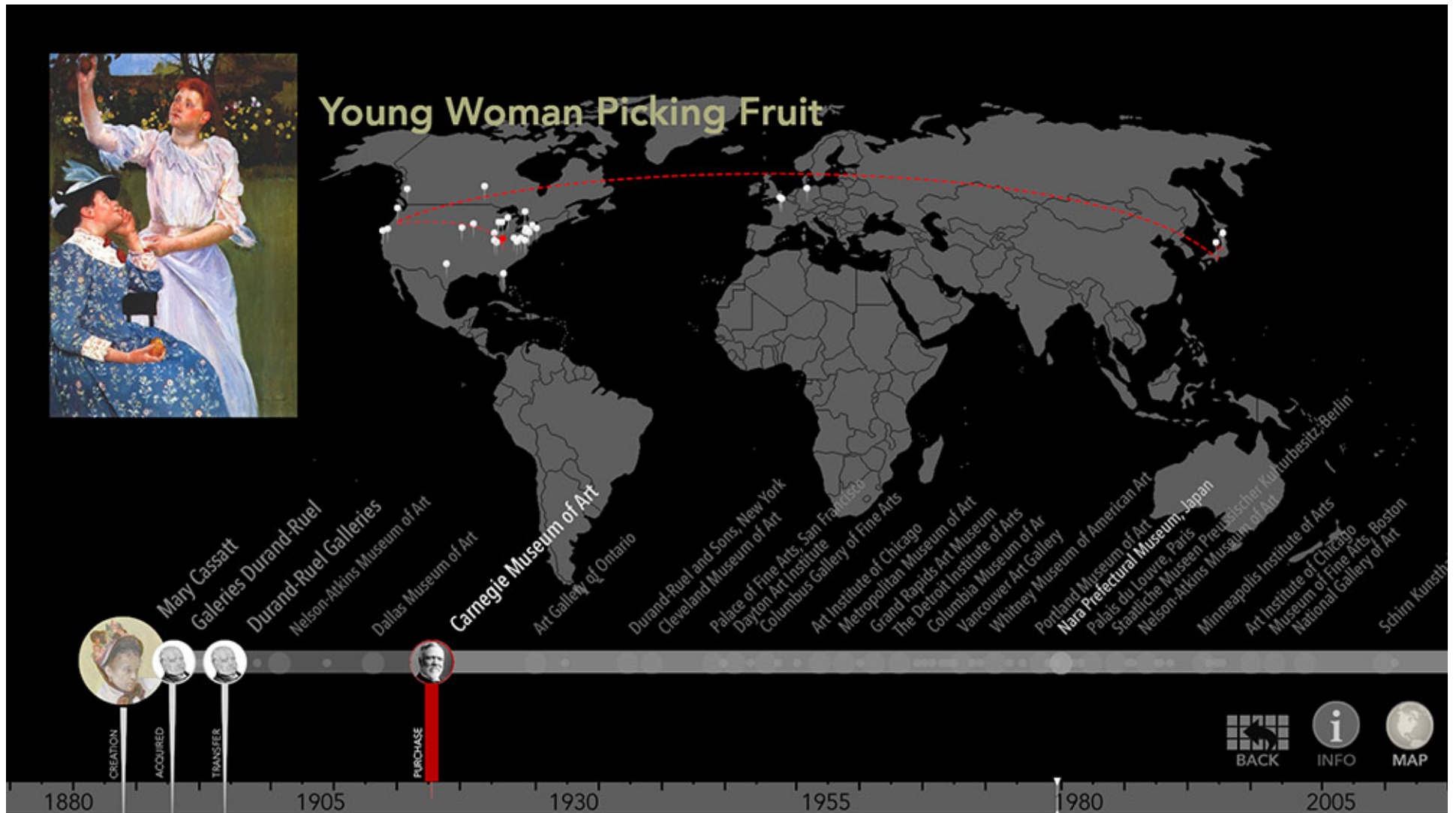
INTRO TO LINKED DATA

- Why should we care about Linked Data?

The Web with/without Linked Data

The image shows a screenshot of the Smithsonian American Art Museum website. The header includes the museum's logo and name, navigation links (About, Blog, Multimedia, Sign up, Shop, Press, Contact), a 'Donate Now' button, and search options. A main navigation bar contains dropdown menus for Visit, Calendar, Exhibitions, Collections, Conservation, Research, Education, and Support, along with a search box. A sidebar on the left lists various collection and acquisition categories. The main content area is filled with placeholder text 'blah blah blah' in various colors and sizes, arranged in paragraphs and columns. A large grey rectangular area is present in the middle of the page. The footer contains the text 'Design for Context' and 'Museums and the Web 2015: How and When to use Linked Open Data 8 April 2015'.

Carnegie Museum of Art program idea: *Art Tracks*



Carnegie Museum of Art provenance app: *Elysa*



Documentation



Madonna and Child Enthroned with SS. Leonard, Jerome, John the Baptist, and Francis [1472]

Nicola di Maestro Antonio d'Ancona

71.4

Nicola di Maestro Antonio d'Ancona; Possibly commissioned by Girolamo Ferretti, San Francesco delle Scale, Ancona, Italy. Unnamed owner, Rome, Italy, by 1828 [1]. Alexander Barker, London, England, by 1854 [2]; *Unnamed owner, Hall's Place, Canterbury, England, until 1880* [3]; (sold at Colnaghi, London, England); George Richmond, R.A; *sale, Christie, Manson & Woods, London, lot, May 1, 1897, lot 46. Vernon J. Watney, Cornbury Park, 1899-?; Lady Margaret Watney, Cornbury Park, Charlbury; Oliver Vernon Watney, Cornbury Park, Charlbury; sale, Christie, Manson & Woods, Ltd., London, in "Highly Important Pictures by Old Masters", lot, June 23, 1967. , 31 CE; Wildenstein & Company, Inc., New York; purchased by Museum, February 1971.*

copy

NOTES: [1] This information comes from correspondence with Matteo Mazzalupi, see curatorial file. [2] The work is recorded as being in Barker's ownership in 1854 by the German art historian Gustav Friedrich Waagen. See Waagen, "Treasures of Art in Great Britain" 1854, v. II, page 128. [3] Hall's Place, in Harbledown near Canterbury, was a country home that underwent several changes in ownership and had many residents. It is uncertain which individual or family purchased this work.

Provenance Party Records ?

Nicola di Maestro Antonio d'Ancona

Girolamo Ferretti

Unnamed owner

Alexander Barker

Unnamed owner

Colnaghi

George Richmond

unknown party

Vernon J. Watney

Lady Margaret Watney

Oliver Vernon Watney

unknown party

unknown party

Wildenstein & Company, Inc.

Original Record

Current Period

Party Lookup

Location Lookup

Exhibition History

Original Text ?

sold, c. 1828 in Rome (information from Matteo Mazzalupi, see curatorial file)

Current Text ?

Alexander Barker, London, England, by 1854

Party Name ?

Alexander Barker

Text Certain ?

yes

Year of Birth ?

click to edit

Direct Transfer?

yes

Year of Death ?

click to edit

Primary Owner?

yes

Party Location ?

London, England

Ownership Dates

by 1854

Acq. Method ?

select a method

Stock Number

click to edit

Footnote

The work is recorded as being in Barker's ownership in 1854 by the German art historian Gustav Friedrich Waagen. See Waagen, "Treasures of Art in Great Britain" 1854, v. II, page 128.

Show Extended Fields

International Image Interoperability Framework (IIIF): *Connecting the diaspora of cultural materials:*

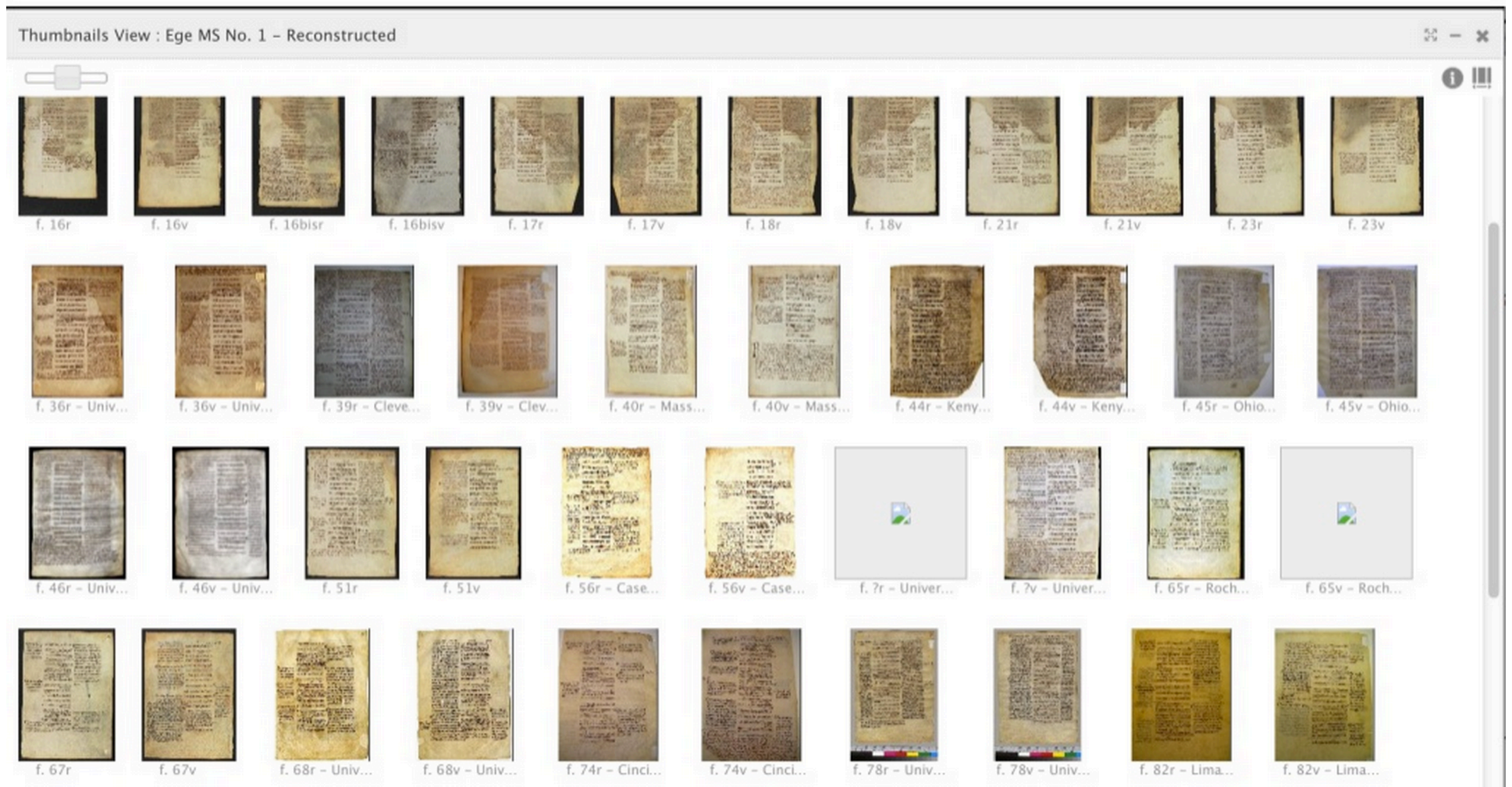
Remnants of Otto Ege MS 1, as of 2014



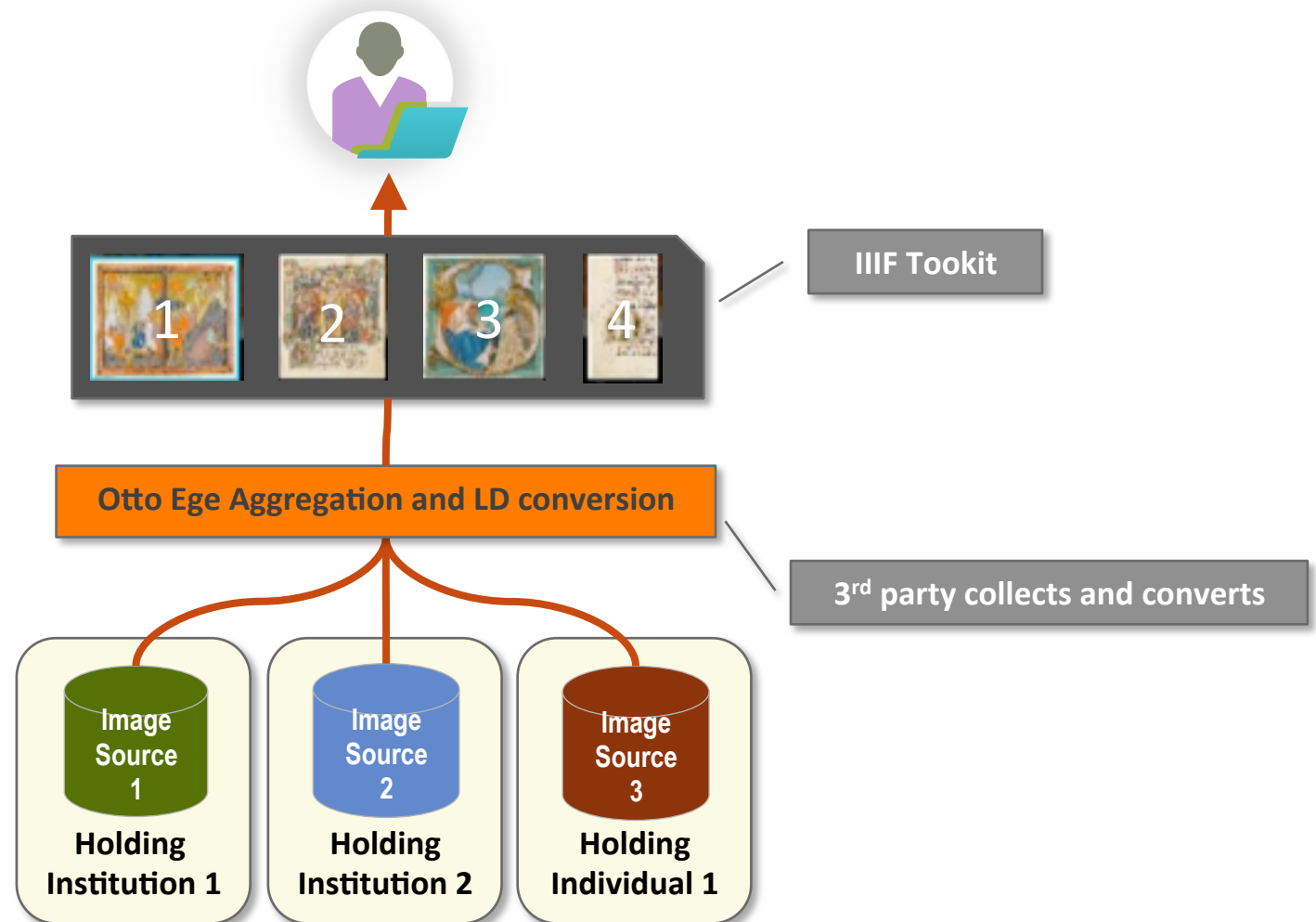
Map data ©2014 Google, INEGI

International Image Interoperability Framework (IIIF): *Connecting the diaspora of cultural materials:*

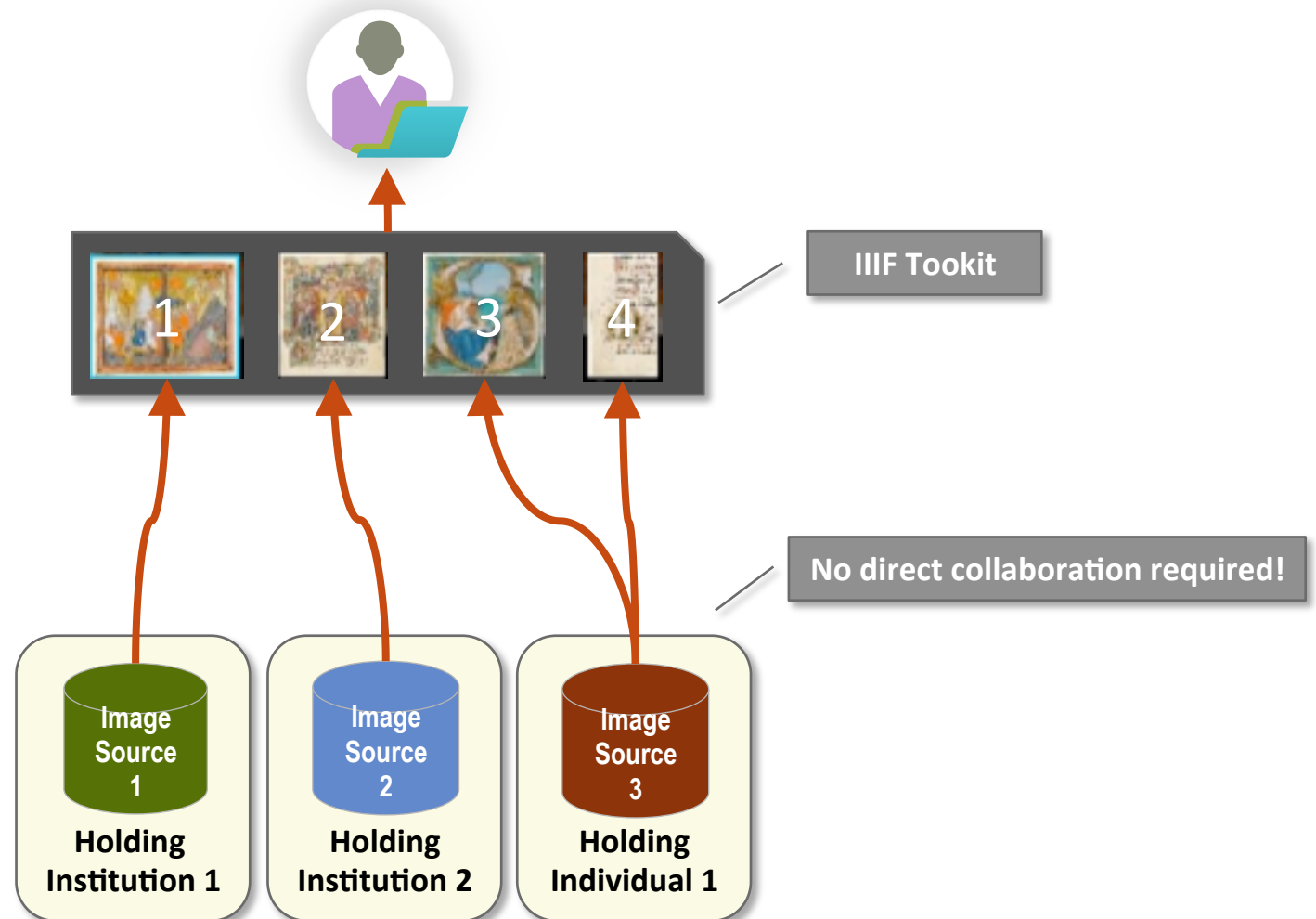
Otto Ege MS 1, Reconstructed, in 2014



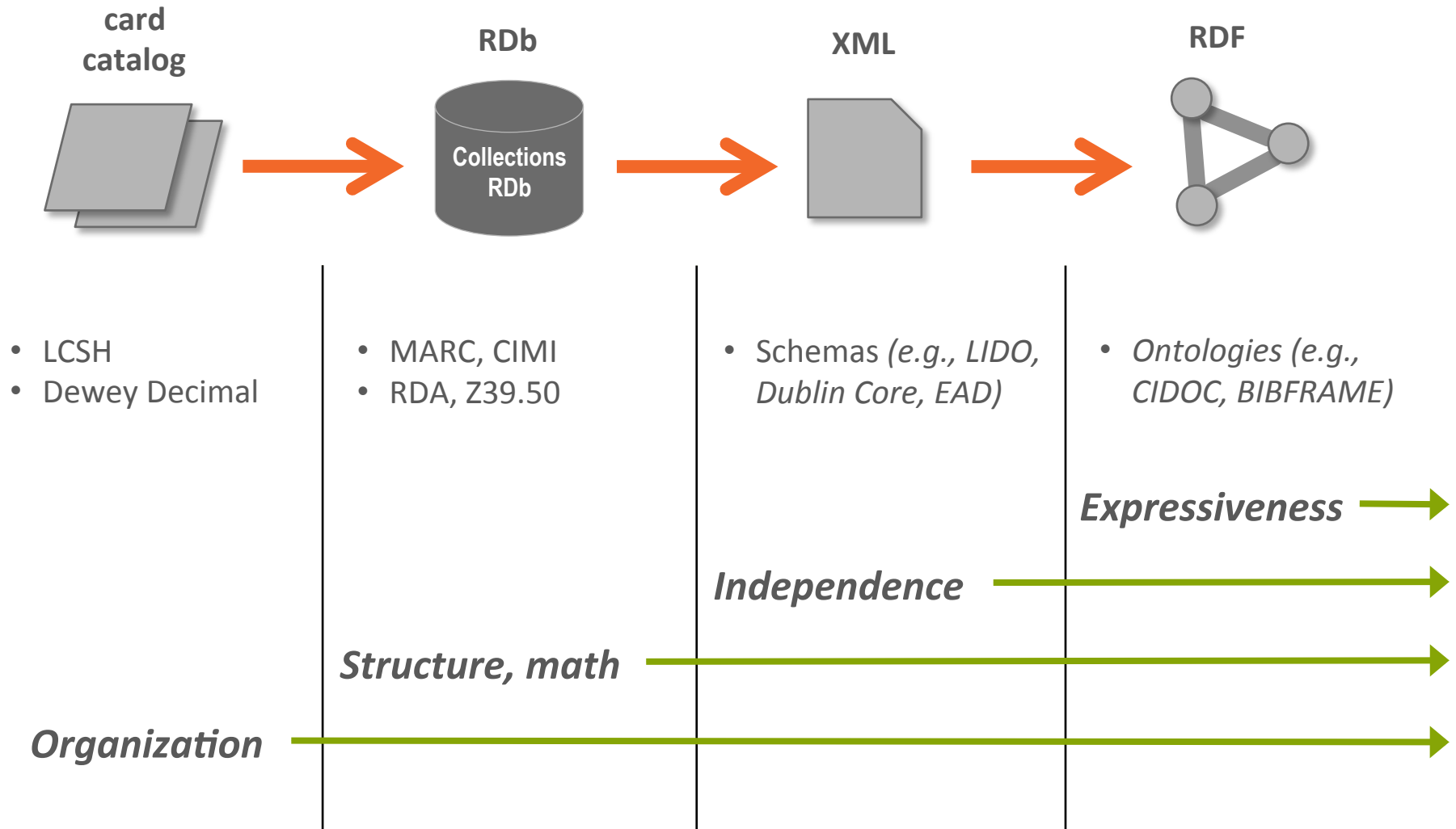
International Image Interoperability Framework (IIIF): *Otto Ege MS1: Aggregated model*



International Image Interoperability Framework (IIIF): *Otto Ege MS1: Federated model*



Linked Data is a “Next Gen” data standard



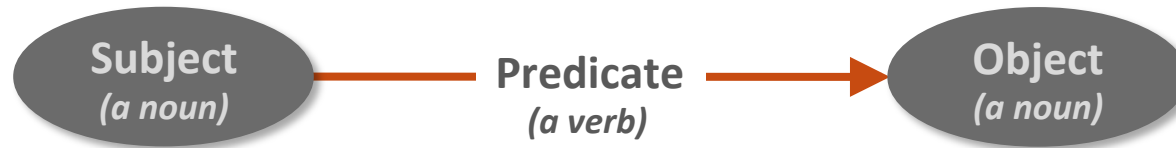
Linked Data value for cultural heritage

- Do more with my content
 - Eliminate silos
 - Enhance scholarship
 - Enhance the museum experience
 - Serve new audiences
 - Manage content more effectively
- Stay relevant and visible (discoverable)
 - In my domain AND at web scale
- Avoid one-off, single-use content and applications
- Enhance/extend my institutional relationships
- ...and more!

INTRO TO LINKED DATA

- Why should we care about Linked Data?
- You need a few key ingredients:
 - RDF Triples: *Assert facts, create “Knowledge Graphs” using URIs*

Semantic Triples: Asserting “facts”



ter Brugghen

Painted



Bagpipe Player (c. 1624)

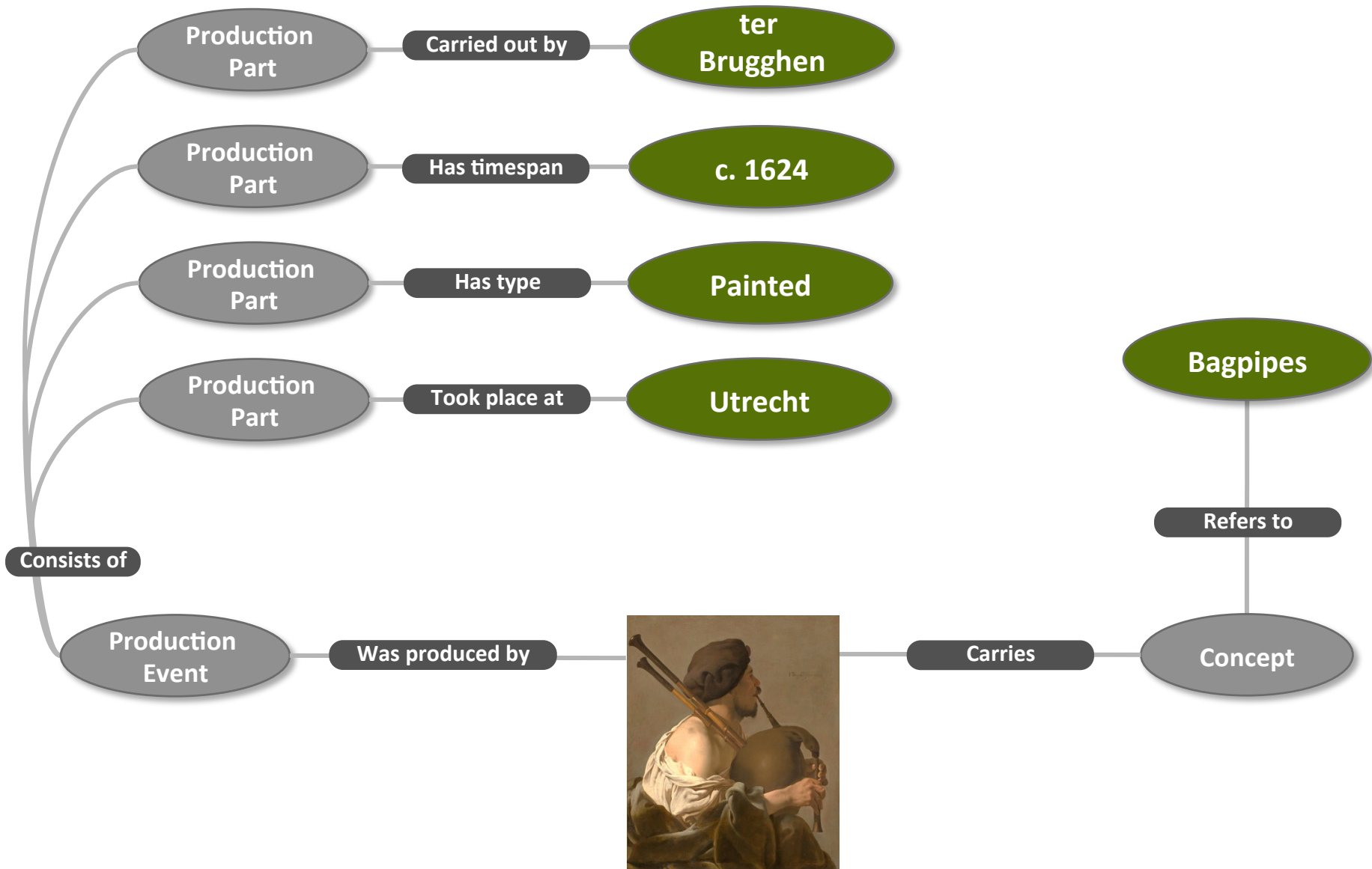
is about



bagpipes

http://en.wikipedia.org/wiki/File:P_Bodart_Portrait_of_Henric_Ter_Brugghen.jpg
<http://www.music.iastate.edu/antiqua/bagpipe.htm>
<http://www.nga.gov/content/ngaweb/Collection/art-object-page.144298.html>

Linking many concepts creates a “Knowledge Graph”



<http://www.nga.gov/content/ngaweb/Collection/art-object-page.144298.html>

URIs establish the unique ID of an instance of a concept

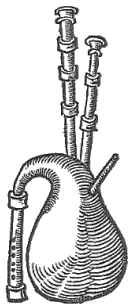
These “resources” are at the heart of RDF



Hendrick ter Brugghen: <https://rkd.nl/en/explore/artists/13338>
<http://purl.org/nga/collection/constituent/9714>
<https://www.freebase.com/m/07x8fh>



Bagpipe Player: <http://purl.org/nga/collection/artobject/144298>
<https://www.freebase.com/m/04rhvt5>



bagpipes: <http://en.wikipedia.org/wiki/Bagpipes>
<https://www.freebase.com/m/0192l>

RDF = Resource Description Framework...a flavor of XML

```
<?xml version="1.0"?>
```

```
<rdf:RDF
```

```
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
```

```
xmlns:cd="http://www.nga.gov/object/144298">
```

```
<rdf:Production
```

```
  <rdf:has_title>Bagpipe Player</rdf:has_title>
```

```
  <rdf:carried_out_by>Hendrick ter Brugghen</rdf:carried_out_by>
```

```
  <rdf:has_timespan>c. 1624</rdf:has_timespan>
```

```
  <rdf:has_type>painted</rdf:has_type>
```

```
  <rdf:took_place_at>Utrecht</rdf:took_place_at>
```

```
</rdf:Production>
```

-
-
-

```
</rdf:RDF>
```

RDF...the Resource Description Framework

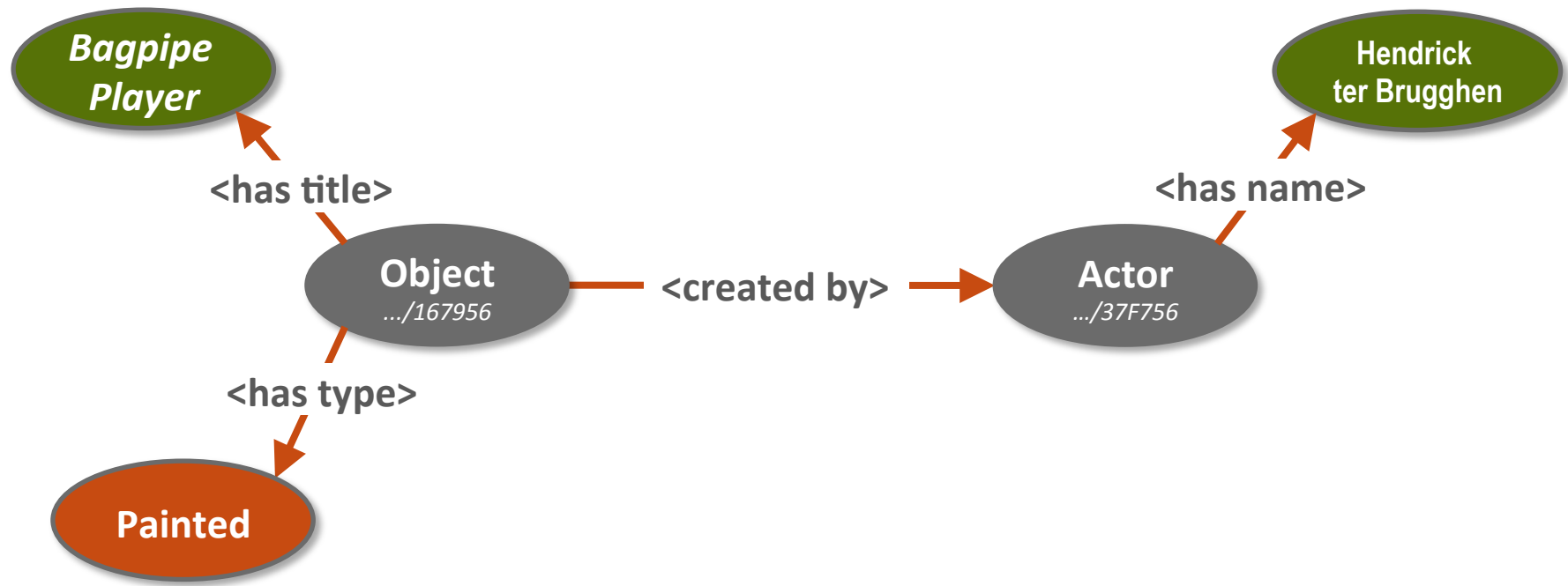
- There are many flavors of RDF *syntax*
 - RDF-XML
 - Turtle
 - N-Triples
 - JSON-LD
 - RDFa
 - ...etc.
- Many tools and platforms do syntax conversion on demand, so this isn't a concern.
- Choose what works for your internal processing, and know you can change or add if needed!

INTRO TO LINKED DATA

- Why should we care about Linked Data?
- You need a few key ingredients:
 - RDF triples: *Assert facts, create “Knowledge Graphs” using URIs*
 - Ontologies and Vocabularies to establish a common language

Ontologies

- They codify meaning and structure around a set of concepts
 - Define entities and predicates that connect them
 - Guidance for linking to formulate assertions
 - Guidance for mapping instances of data (names/types) to concepts



Ontologies

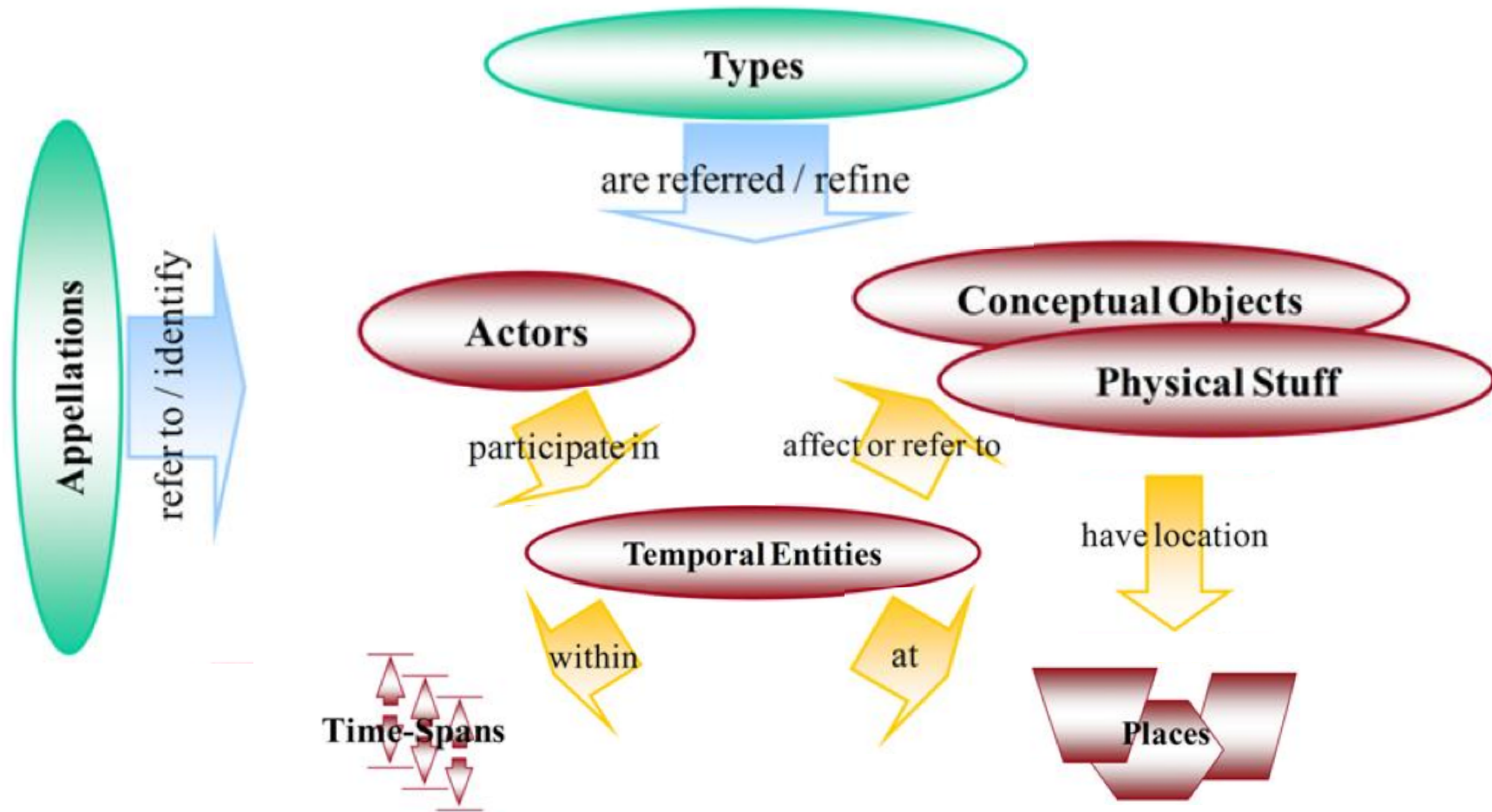
- ***General-purpose ontologies***
 - schema.org
 - Commonly used in the industry: **skos, bibo, foaf, geonames, prov, etc.**

- ***Domain-specific ontologies***
 - **Conceptual Reference Model (CRM)** for cultural heritage writ large
 - **FRBR** and **BIBFRAME** for libraries
 - A few contenders in development for archives

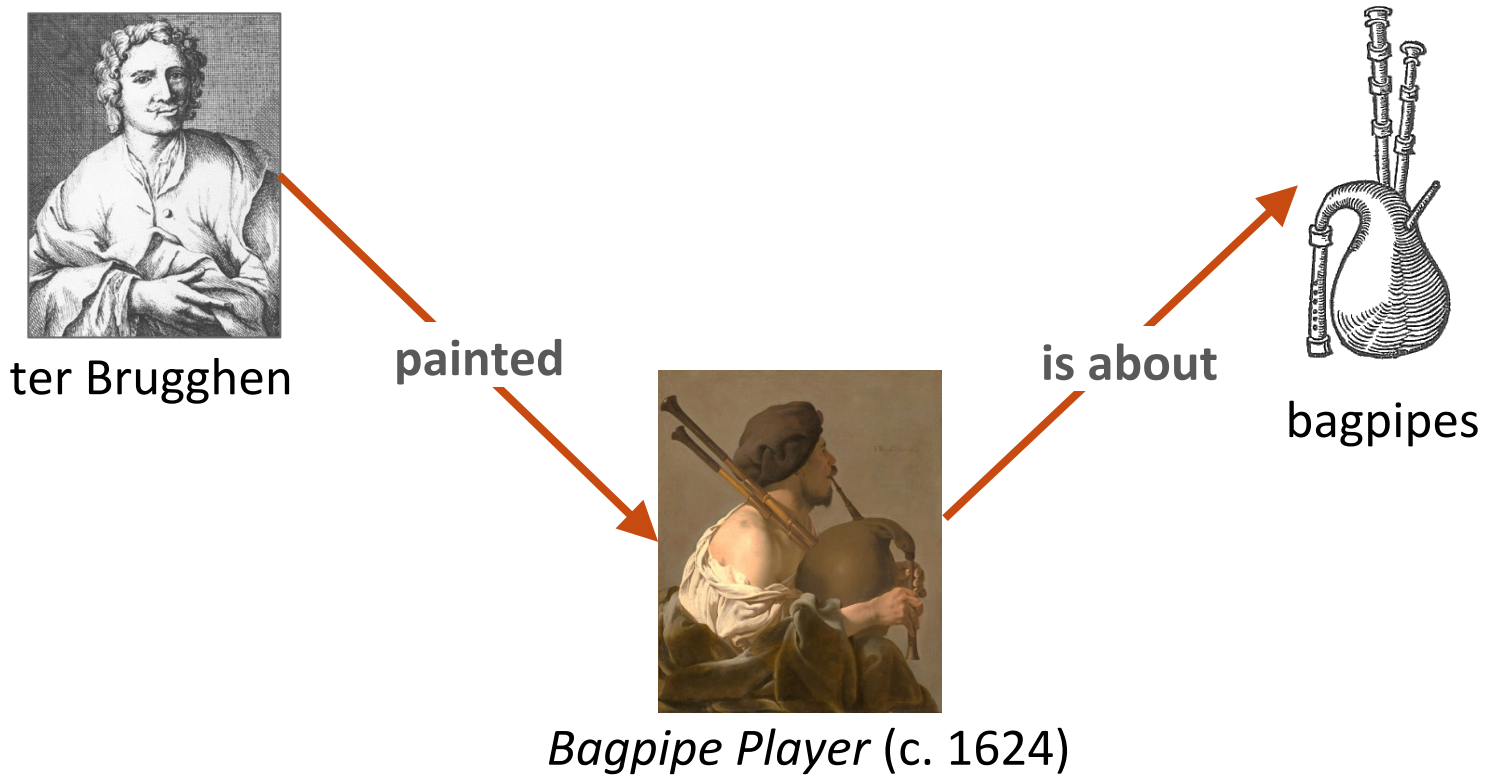
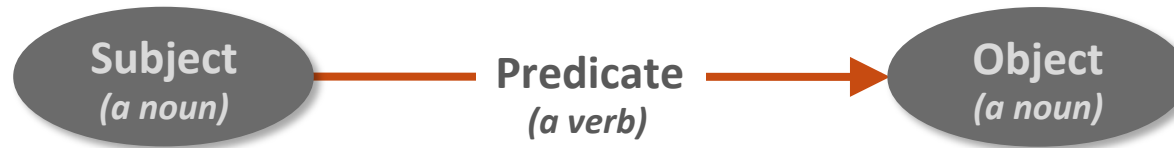
CIDOC-CRM, an ontology for cultural heritage

- Created by the International Council of Museums
- The product of more than 20 years of work
- An ISO standard
- Only 86 classes and 137 properties
- Event-based (both persistent things and temporary things)
- Easily extended
- Proving robust in the face of modeling a broad array of cultural heritage data

Ontologies: *CIDOC-CRM* – a relatively simple model



Semantic Triples: Asserting “facts”



http://en.wikipedia.org/wiki/File:P_Bodart_Portrait_of_Henric_Ter_Brugghen.jpg
<http://www.music.iastate.edu/antiqua/bagpipe.htm>
<http://www.nga.gov/content/ngaweb/Collection/art-object-page.144298.html>

Exercise: *Predicate Playground*

- Connect the dots!
 - Split into small groups
 - Use the elements on the page to create a graph of triples
 - Use your personal knowledge and/or the web to build your graph. Don't worry about the CRM for now...and name your predicates as you see fit.
 - Brief out your examples. Can you divine a general topic from your elements?
 - Wouldn't it be a more interesting and complete picture if this data were connected into one big graph? With a resource like VIAF you can do it easily!
 - What if a teach could make use of this graph to discover the availability of resources?

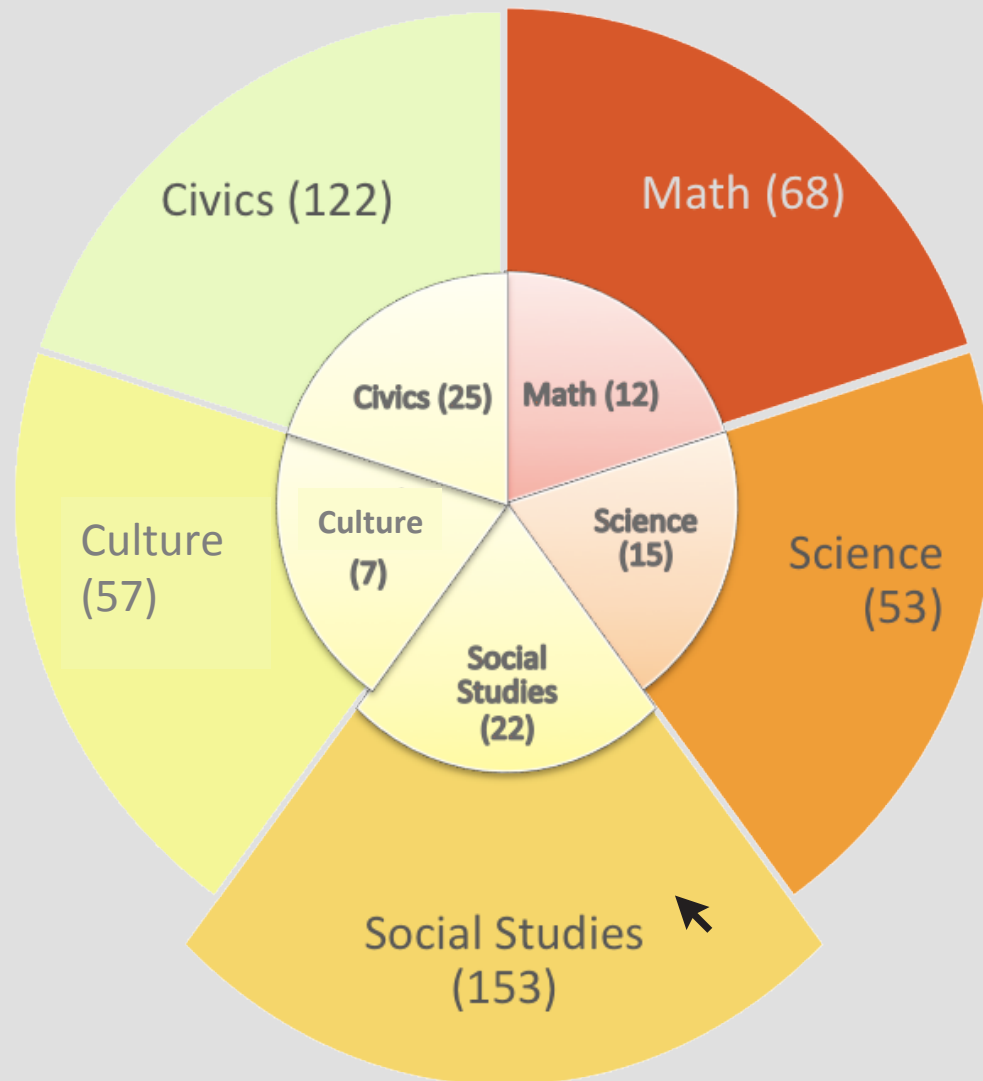
Subject: All

Curricula: Core

Grade Level: 6-12

Results for Benjamin Franklin

534 results total



Available online



Available in school district

My Lesson Plans

Benjamin Franklin: A Great Thinker

Math

- Worksheet

Science

- On seasonal time (Hudson)
- Electricity Worksheet

Civics

-

Social Studies

-

Culture

- Vie de Franklin, écrite par lui-même - Tome I (French)
- Vie de Benjamin Franklin, écrite par lui-même - Tome II (French)

Social Studies

Texts

11 Internal
74 External

Videos

2 Internal
12 External

Visuals

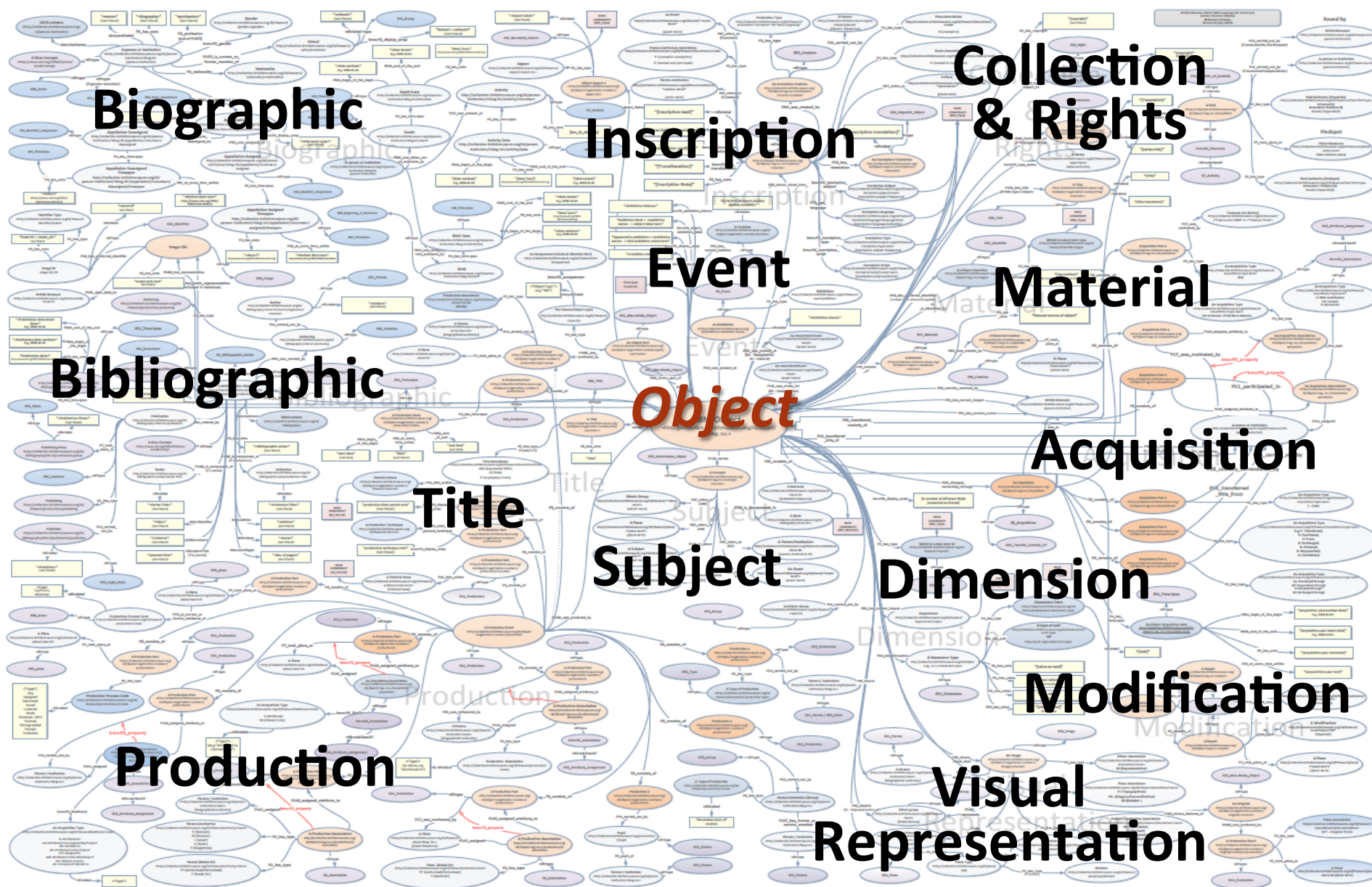
8 Internal
59 External

Activity Guides

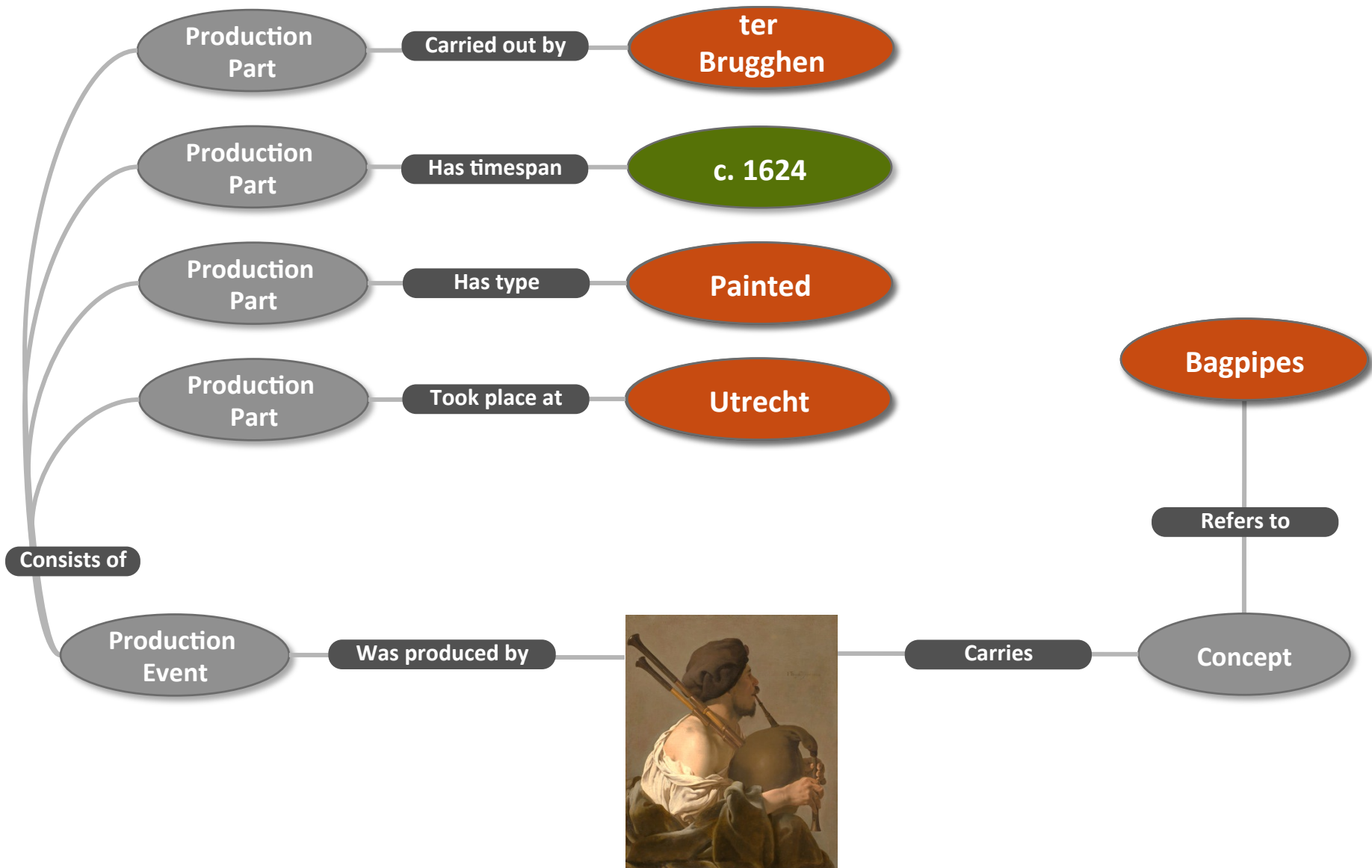
1 Internal
8 External

[See details](#)

British Museum Collection Mapping using CIDOC-CRM



Mapping to the CRM model for “production”



Vocabularies and Instance Data

- 3rd party authorities, e.g.
 - Getty Vocabularies
 - GeoNames
 - Virtual International Authority File (VIAF)
 - DBpedia
- Local authorities
 - Vocabularies unique to your institution (e.g., department names)
 - Your variation on an existing authority (e.g., we prefer a variant name of the artist)

INTRO TO LINKED DATA

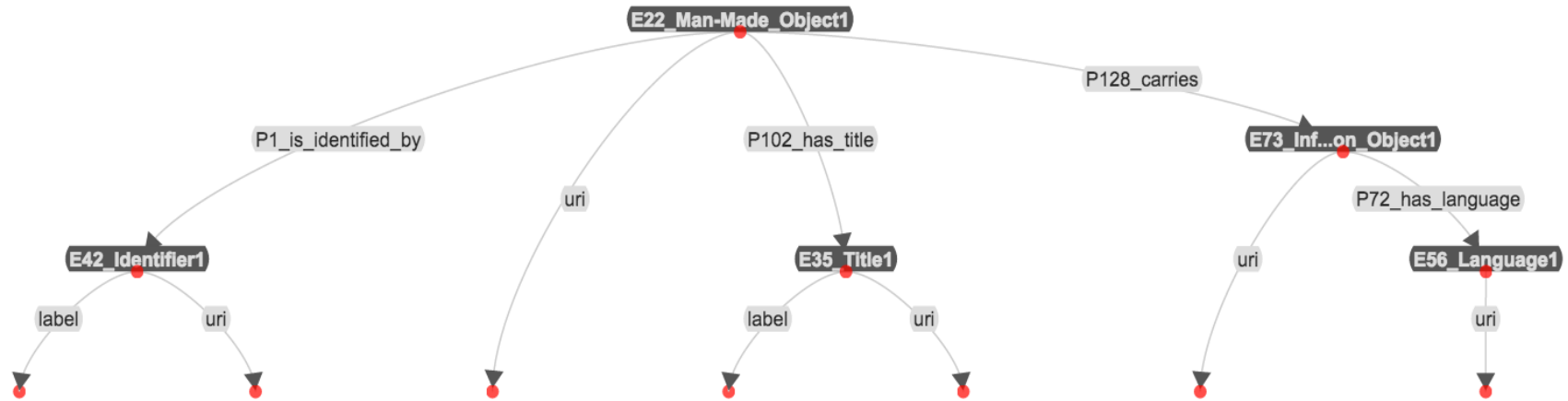
- Why should we care about Linked Data?
- You need a few key ingredients: RDF triples, Ontologies and Vocabularies
- Modeling and Mapping

Modeling and Mapping

- **Modeling**
 - Defining the concepts in our domain of interest
 - *What to call them, how to type them*
 - *Their relationships to one another*
 - Rules for linking “things” together
 - Based on analysis of your existing data and your knowledge of the domain
- **Mapping**
 - Translating your data to triples using the model, linking rules and vocabularies

Mapping view in KARMA tool

museum-data.json ✓
Name: museum-data.json | **Prefix:** s | **Base URI:** http://localhost:8080/source/



doc ▾

descriptiveNonRepeating ▾

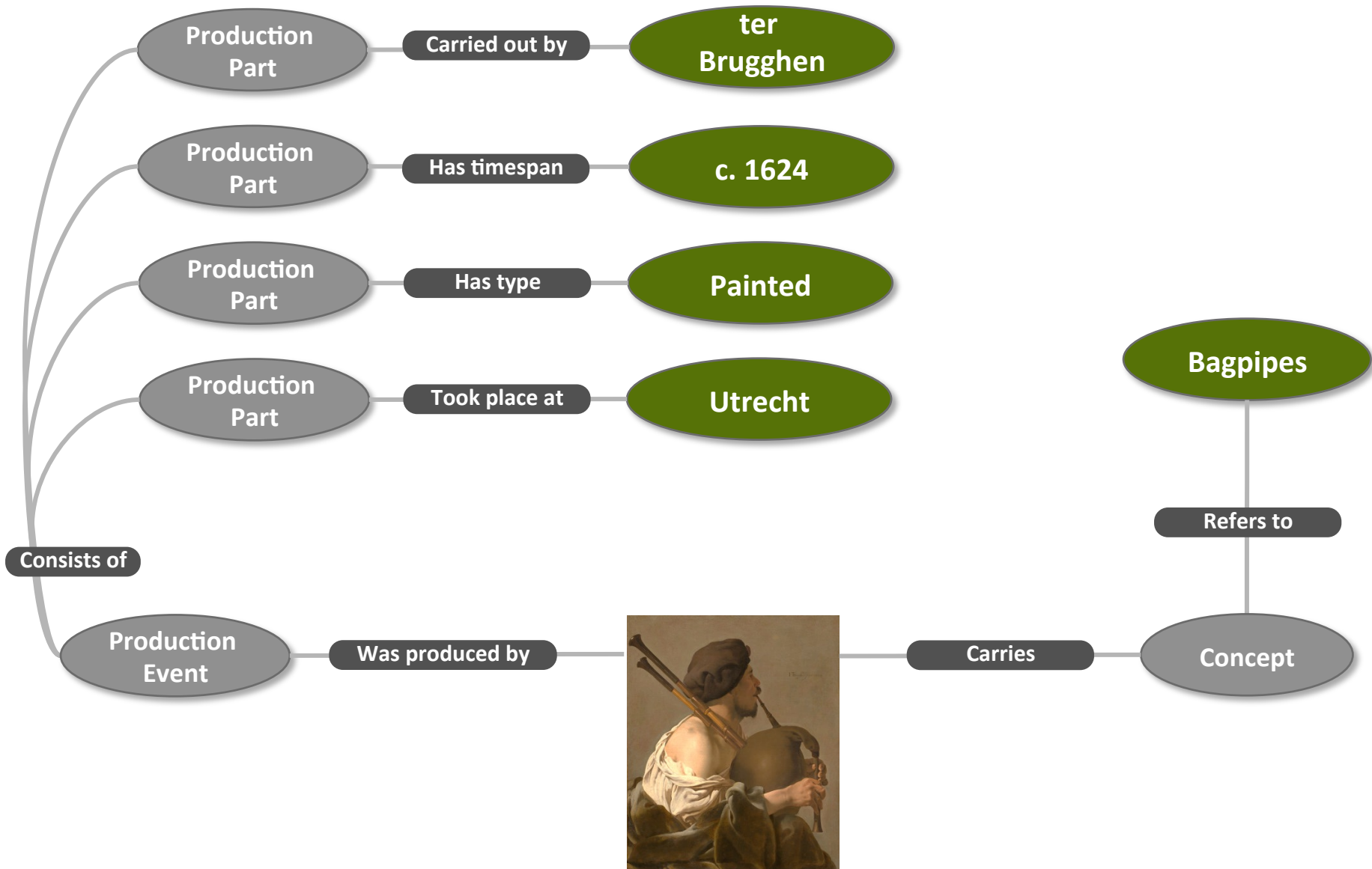
record_ID ▾	record_identifier_uri ▾ G	record_uri ▾ G	title ▾ content ▾	record_title_uri ▾ G	information_object_uri ▾ G
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indexedStructure ▾

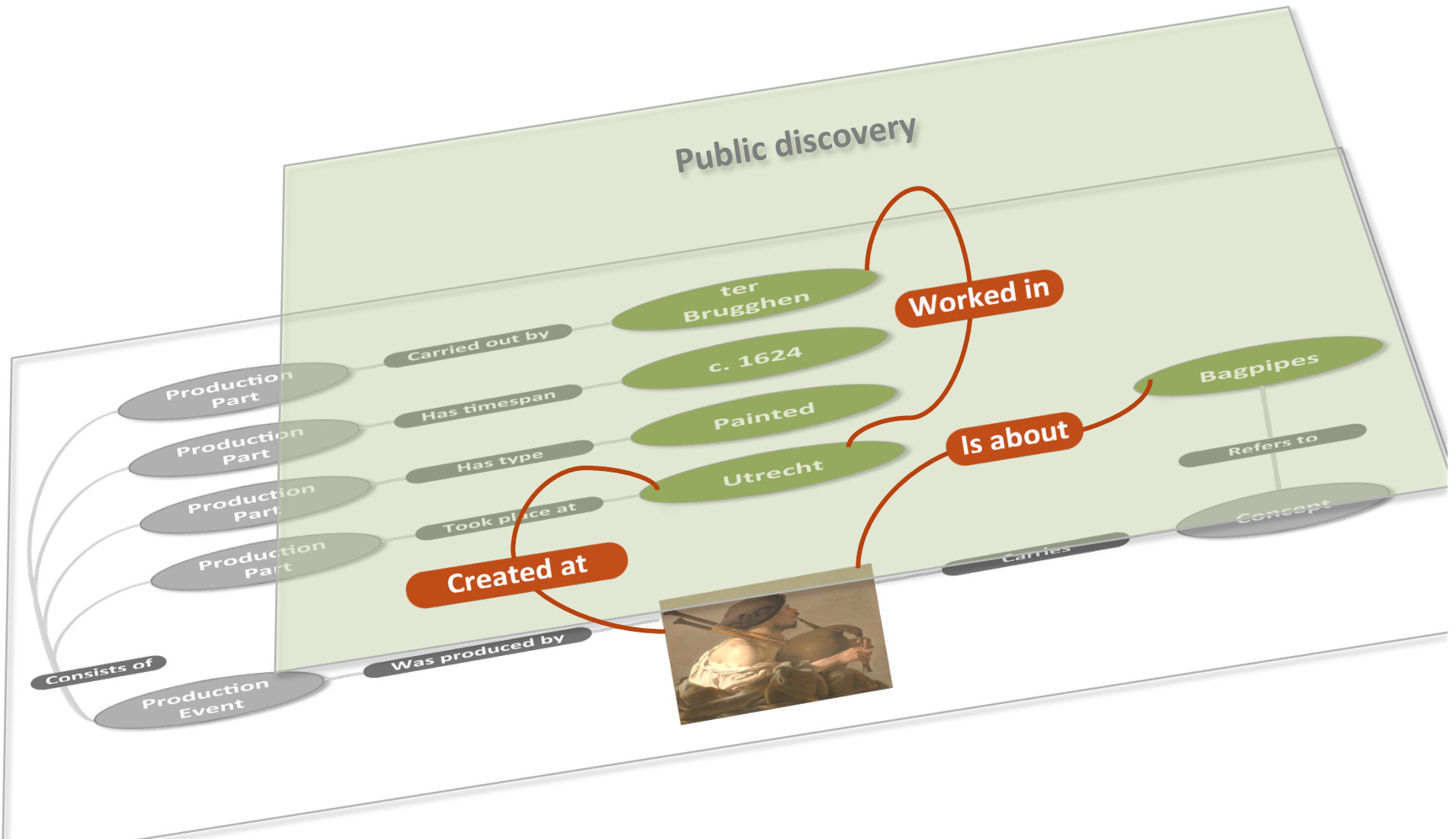
language ▾
language_uri ▾ G

siris_sil_73088	object/siris_sil_73088...	object/siris_sil_73088	Everyday Lakota : an English-Sioux dictionary for beginners / General	object/siris_sil_73088...	record/siris_sil_73088...	thesauri/language/da... Da la
siris_arc_87459	object/siris_arc_8745...	object/siris_arc_87459	Letter in English	object/siris_arc_8745...	record/siris_arc_8745...	thesauri/language/en... Er la

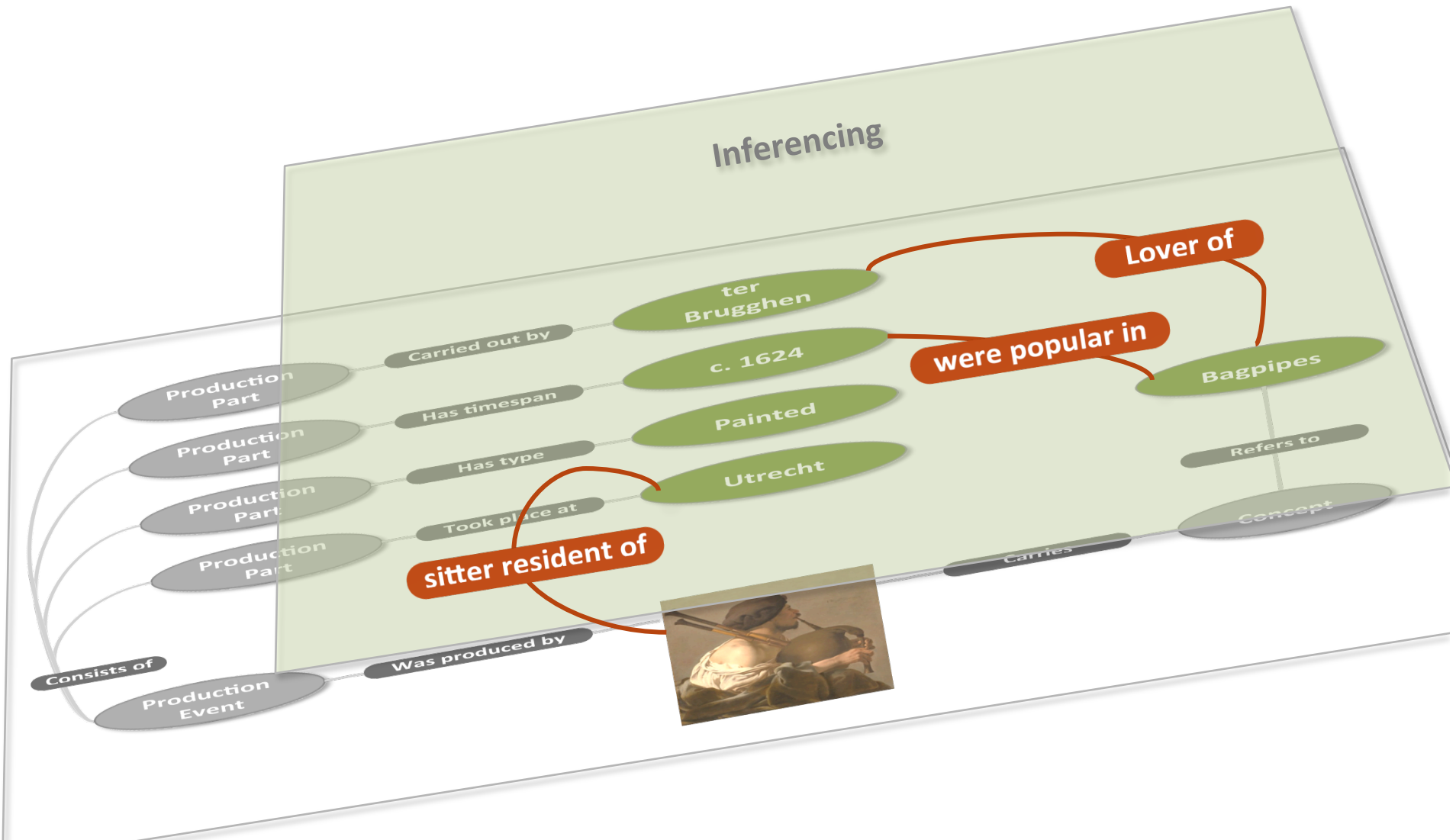
Mapping: *Shortcuts for user convenience*



Shortcuts and non-destructive contexts

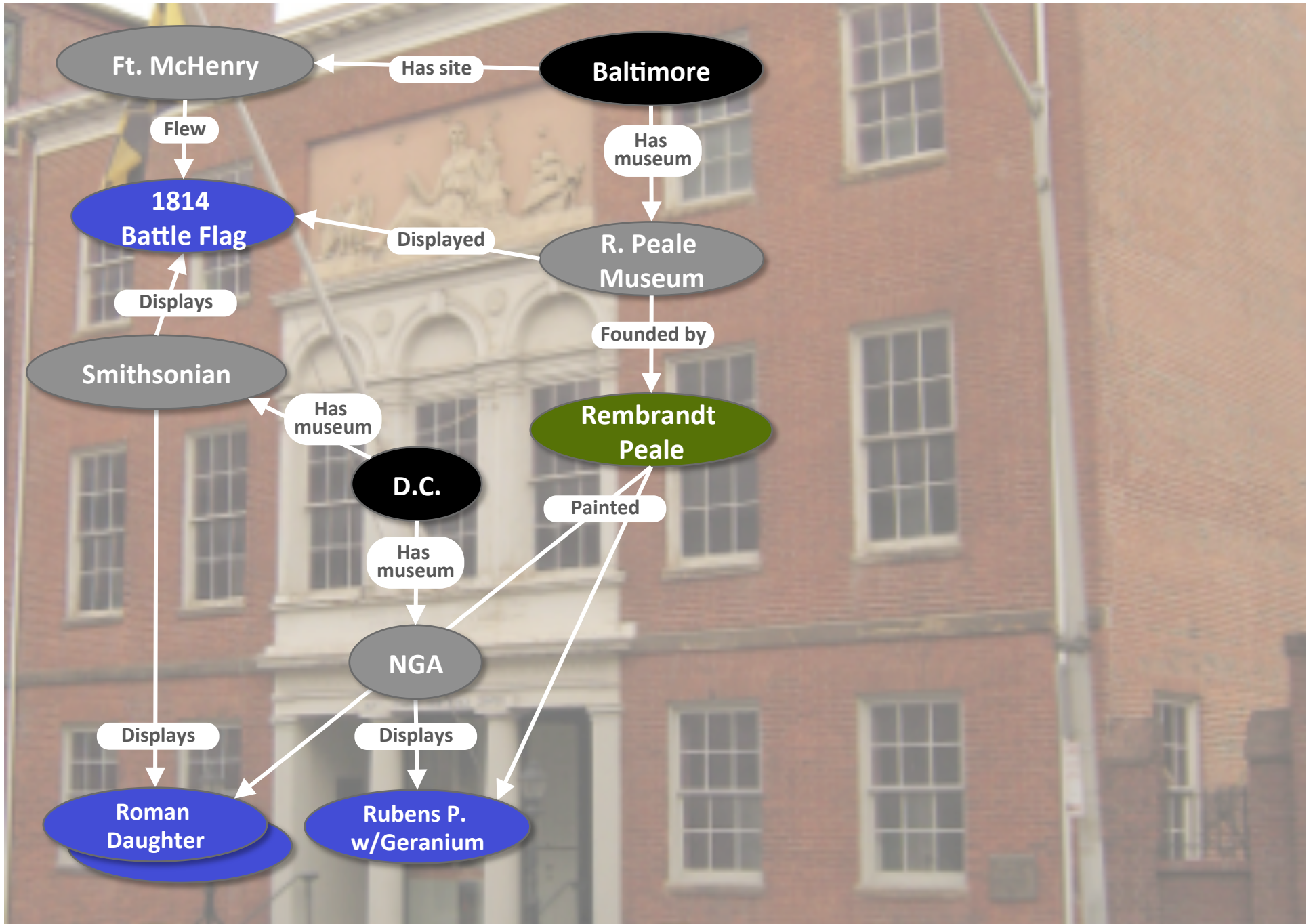


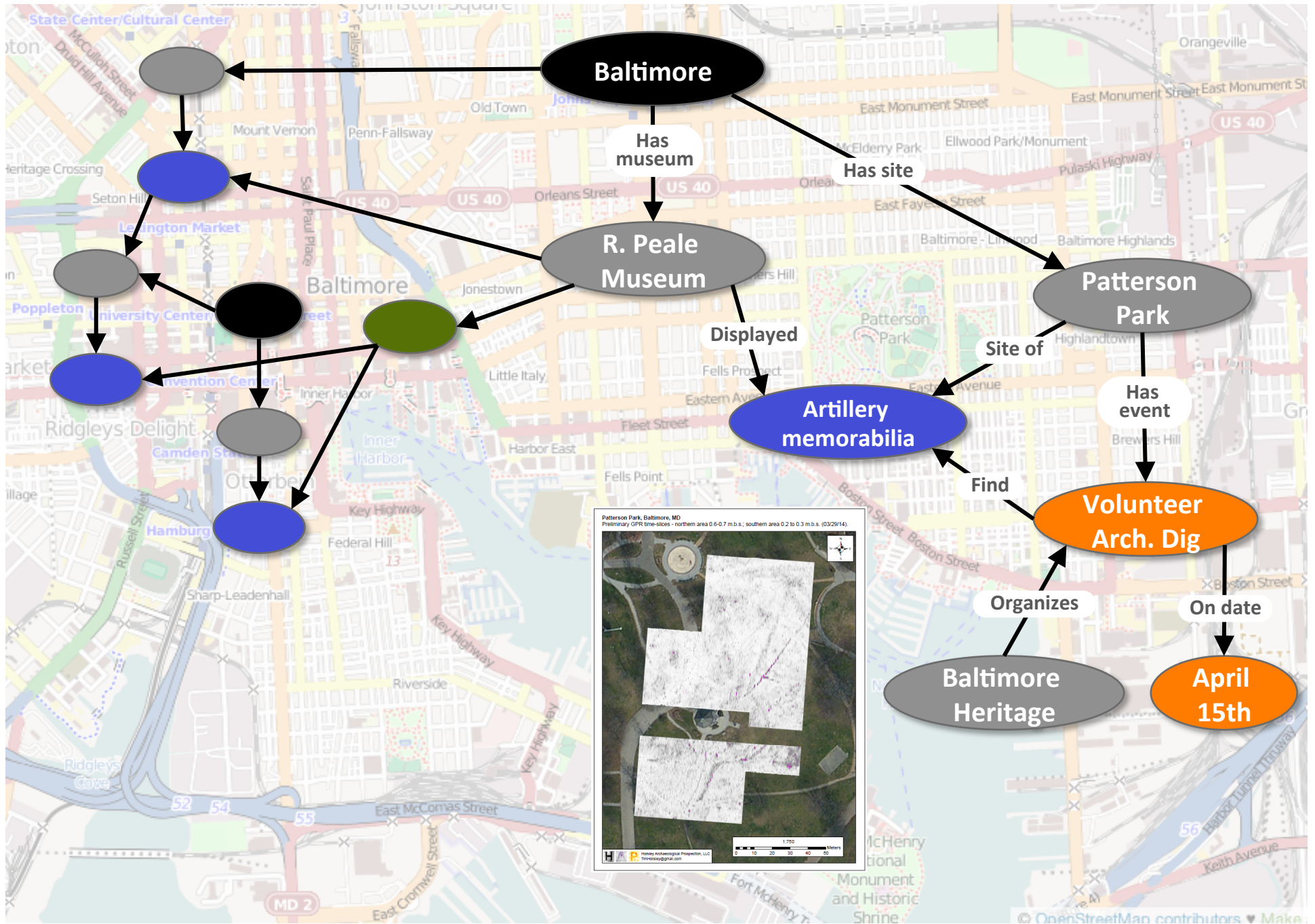
Inferencing: *Eliciting facts without linking explicitly*



INTRO TO LINKED DATA

- Why should we care about Linked Data?
- You need a few key ingredients: RDF triples, Ontologies and Vocabularies
- Modeling and Mapping
- Enhancing capacity for “serendipitous discovery” by linking between LD sources





List of potential data sources for Peale example

- Cultural data
 - Cultural object information
 - Historical exhibition information
 - Images/media
- Geographic data
 - Placenames
 - Geolocations
 - Maps
 - Building registry
- Public data
 - Public events
 - Organizational events
- Historical data
 - State and city history
 - Art history
 - American, British, Canadian History
 - Historical biography



WHAT'S OUT THERE IN THE WILD?

Examples of linked data applications on the web

Design exercises and thought pieces to extend our thinking on some concepts

William Suttle, "Untitled", 1938, Smithsonian American Art Museum <http://americanart.si.edu/collections/search/artwork/?id=23561>





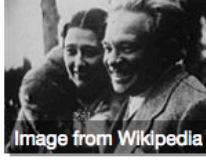






Social Networks & Archival Context (SNAC)

social networks and archival context PROTOTYPE HOME ABOUT PROTOTYPE **snac**

Search by: All Person Family Organization

enter a name or keywords search


Explore featured identities

 <p>Image from Wikipedia</p> <p>2 related collections</p> <p>Anderson, Nicholas Longworth, 1838-1892</p>	 <p>Image from Wikipedia</p> <p>14 related collections</p> <p>Bohm, Max, 1868-1923</p>	 <p>Image from Wikipedia</p> <p>18 related collections</p> <p>Elsasser, Walter M., 1904-</p>	 <p>Image from Wikipedia</p> <p>9 related collections</p> <p>Laurance, John, 1750-1810</p>	 <p>Image from Wikipedia</p> <p>3 related collections</p> <p>Respighi, Elsa, 1894-1996</p>
 <p>Image from Wikipedia</p> <p>3 related collections</p> <p>Brainerd, David, 1718-1747</p>	 <p>Image from Wikipedia</p> <p>9 related collections</p> <p>Brainerd, David, 1718-1747</p>	 <p>Image from Wikipedia</p> <p>7 related collections</p> <p>Herring, Thomas, 1693-1757</p>	 <p>Image from Wikipedia</p> <p>2 related collections</p> <p>Metz, Jamie Frederic</p>	 <p>Image from Wikipedia</p> <p>15 related collections</p> <p>Robertson, William, 1721-1793</p>
				 <p>SHAKE-SPEARES</p>

<http://socialarchive.iath.virginia.edu/snac/search>

Social Networks & Archival Context (SNAC)

social networks and archival context **PROTOTYPE HOME** ABOUT PROTOTYPE **snac**

 **Bohm, Max, 1868-1923** Alternative names

Dates: birth 1868 death 1923	Authority Source: WorldCat, VIAF, LC Nationality: Language:
---	--

Gender:

Biographical notes:




Image from Wikipedia

Max Bohm (1868-1923) was a painter in Provincetown, Mass.

Max Bohm was born on January 21, 1868, in Cleveland, Ohio. He began his study of art in 1887 and studied in artist communities in Brittany and in Paris at the Academie Julian with Boulanger, Lefebvre, and Benjamin Constant. He and his family spent the next several decades moving between France, England, and various places in the U.S. Eventually, they settled in Bronxville, N.Y. and had a cottage in Provincetown, Mass., where Bohm died on September 19, 1923.

From the description of Max Bohm papers, 1873-1970, bulk 1880-1959. (Unknown). WorldCat record id: 430380032

From the description of Max Bohm papers, 1870-1970, bulk 1880-1959. (Unknown). WorldCat record id: 422875086

Painter; Provincetown, Mass.

Born in Cleveland, Ohio.

From the description of Max Bohm papers, 1856-1964. (Unknown). WorldCat record id: 227190065

American painter.

From the description of Receipt, 1898 Aug. 13. (Getty Research Institute). WorldCat record id: 82151837

Links to collections

[Archival Collections](#) 14

creator of **referenced in**

[BOHM, MAX. Artist file : miscellaneous uncataloged material.](#)
Museum of Modern Art (MOMA)

[Bohm, Max, 1868-1923. Artist file.](#)
Brooklyn Museum Libraries & Archives

[Bohm, Max, 1868-1923. Max Bohm papers, 1856-1964.](#)
Unknown (ISIL:DSI-AAA)

[Bohm, Max, 1868-1923. Max Bohm papers, 1870-1970, bulk 1880-1959.](#)
Unknown (ISIL:DSI-AAA)

[Bohm, Max, 1868-1923. Max Bohm papers, 1873-1970, bulk 1880-1959.](#)
Unknown (ISIL:DSI-AAA)

[Bohm, Max, 1868-1923. Receipt, 1898 Aug. 13.](#)
Getty Research Institute

[Bohm, Max. \[Max Bohm\] : artist file](#)
John and Mable Ringling Museum of Art Library

[Milch Gallery. Milch Gallery records, 1911-1980.](#)
Unknown (ISIL:DSI-AAA)


[Milch Gallery. Milch Gallery records, 1911-1980.](#)
Unknown (ISIL:DSI-AAA)

Design for Context


Museums and the Web 2015: How and When to use Linked Open Data 8 April 2015

Europeana

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View item at [Nationalmuseum, Sweden](#) [↗](#)

[Share](#)

[W](#) Cite on Wikipedia

[🗨️](#) [🌐](#) Translate details

Select language ▾

Victor Hugo (1883)

Description:
Signerad: A.Rodin

Creator:
[Auguste Rodin, Rodin, Auguste](#) (Auguste Rodin; Rodin, Auguste) To: 1917-11-01+02:00, 1917-11-17+02:00
Related concept: http://dbpedia.org/resource/Auguste_Rodin Date of birth: 1840-11-12+02:00 Date of death: 1917-11-01+02:00 , 1917-11-17+02:00

Type:
[Sculpture](#); [sculpture \(visual work\)](#); [kipi](#)

Format:
Mått 46 cm; brons; Brons

Subject:
[Victor Hugo](#)

Identifier:
(Inv. Nr.:NMSk 943); 27252

Data provider:
[Nationalmuseum, Sweden](#)

Provider:
[AthenaPlus](#)

Providing country:
Sweden

[Auto-generated tags ▾](#)

<http://www.europeana.eu/portal/>

RelFinder

The screenshot shows the RelFinder web application interface. On the left, there is a search panel with the following elements:

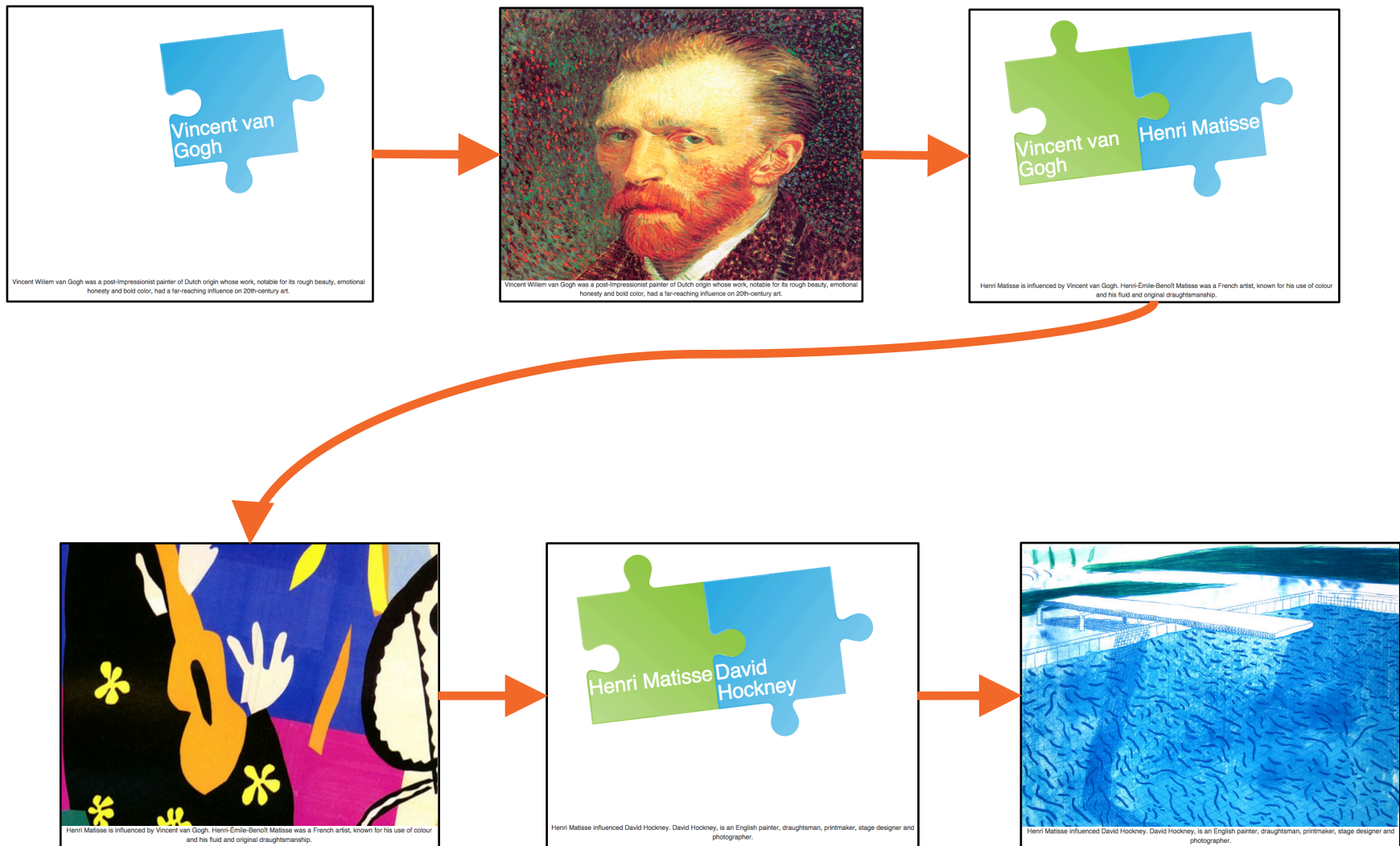
- Buttons for "between" and "examples".
- Input fields for search terms: (1) Benjamin Franklin, (2) Thomas Jefferson.
- Buttons: "add", "clear", "Find Relations".
- Filter by: relations: (51/51). Filter options: length, class, link, connect...
- A table showing the number of objects for different relation lengths:

number of objects	num	vi
0	2/2	🗖
1	10/10	🗖
2	39/39	🗖

The main area displays a complex network graph. The nodes represent entities, and the edges represent relationships. The nodes are labeled with names and titles, such as "Benjamin Franklin", "Thomas Jefferson", "George Washington", "John Adams", "Thomas Paine", "Christopher Hitchens", "William Short (Americ...", "Samuel Dexter", "Richard Henry Lee", "Gideon Granger", "Thomas Mifflin", "Jonathan Russell", "Democratic-Republic...", "Martha Jefferson Rand...", "James Madison", "Aaron Burr", "George Clinton (vice p...", "Early life and career of...", "children", "child", "successor", "vicePresident", "president", "treasury", "office", "appointer", "for", "appointed", "associate", "List of counties in Ohio", "gress of the Confe...", "influenced", "influences", "influencedBy", "title", "predecessor", "successor", "before", "vicePresident", "inaugural", "United States Postmas...", "United States Ambass...", "Thomas Paine", "Christopher Hitchens", "William Short (Americ...", "Samuel Dexter", "John Adams", "George Washington", "Richard Henry Lee", "Gideon Granger", "Thomas Mifflin", "Jonathan Russell", "Democratic-Republic...", "Martha Jefferson Rand...", "James Madison", "Aaron Burr", "George Clinton (vice p...", "Early life and career of...", "children", "child", "successor", "vicePresident", "president", "treasury", "office", "appointer", "for", "appointed", "associate", "List of counties in Ohio", "gress of the Confe...", "influenced", "influences", "influencedBy", "title", "predecessor", "successor", "before", "vicePresident", "inaugural", "United States Postmas...", "United States Ambass...", "Thomas Paine", "Christopher Hitchens", "William Short (Americ...", "Samuel Dexter", "John Adams", "George Washington", "Richard Henry Lee", "Gideon Granger", "Thomas Mifflin", "Jonathan Russell", "Democratic-Republic...", "Martha Jefferson Rand...", "James Madison", "Aaron Burr", "George Clinton (vice p...", "Early life and career of...", "children", "child", "successor", "vicePresident", "president", "treasury", "office", "appointer", "for", "appointed", "associate", "List of counties in Ohio", "gress of the Confe...", "influenced", "influences", "influencedBy", "title", "predecessor", "successor", "before", "vicePresident", "inaugural", "United States Postmas...", "United States Ambass...".

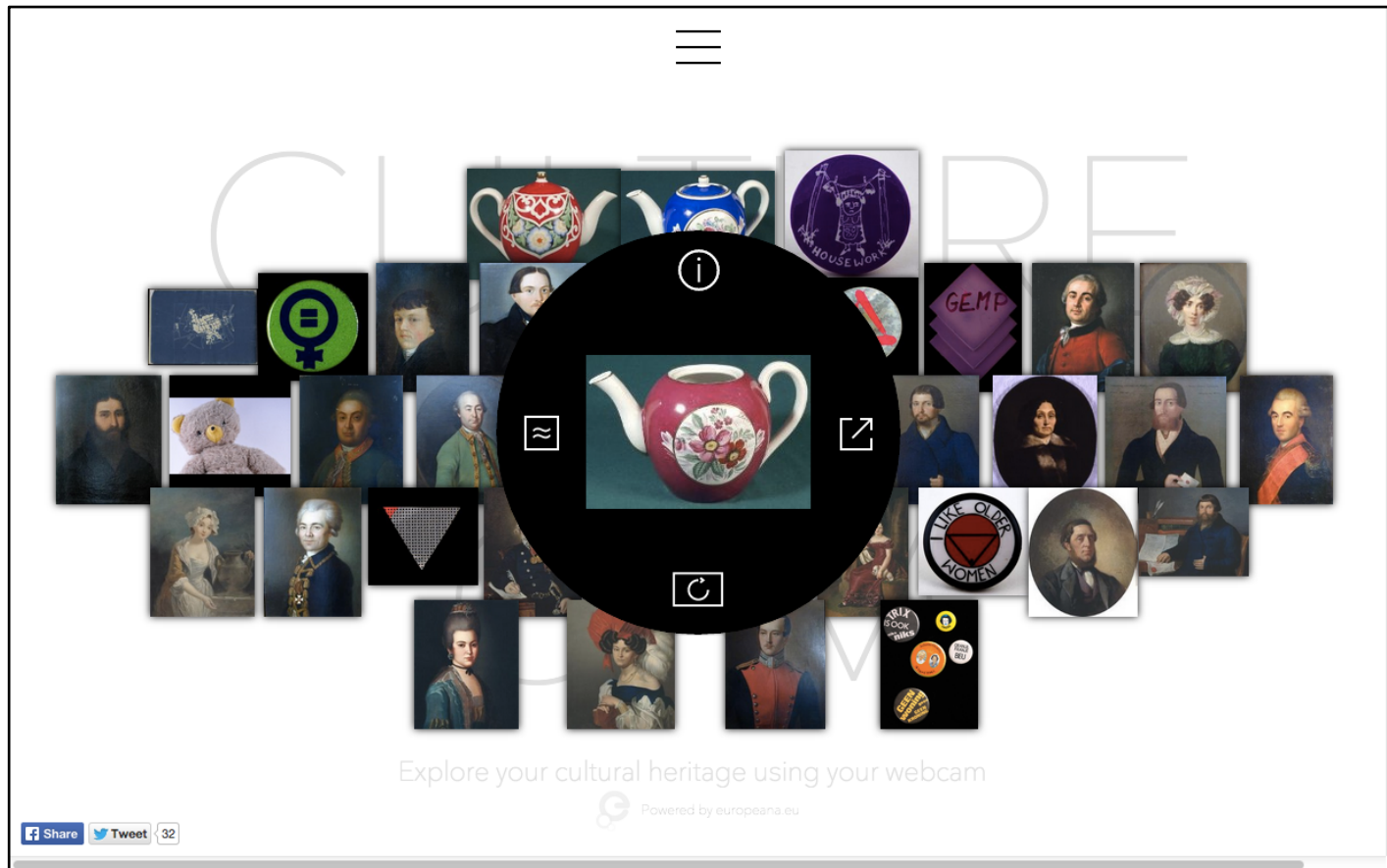
<http://www.visualdataweb.org/refinder/refinder.php>

USC Information Sciences Institute: *LOD Stories* app



http://lodstories.isi.edu/L_ODStories/html/linkedataeduapp.html

Culture Cam



<http://culturecam.eu/>

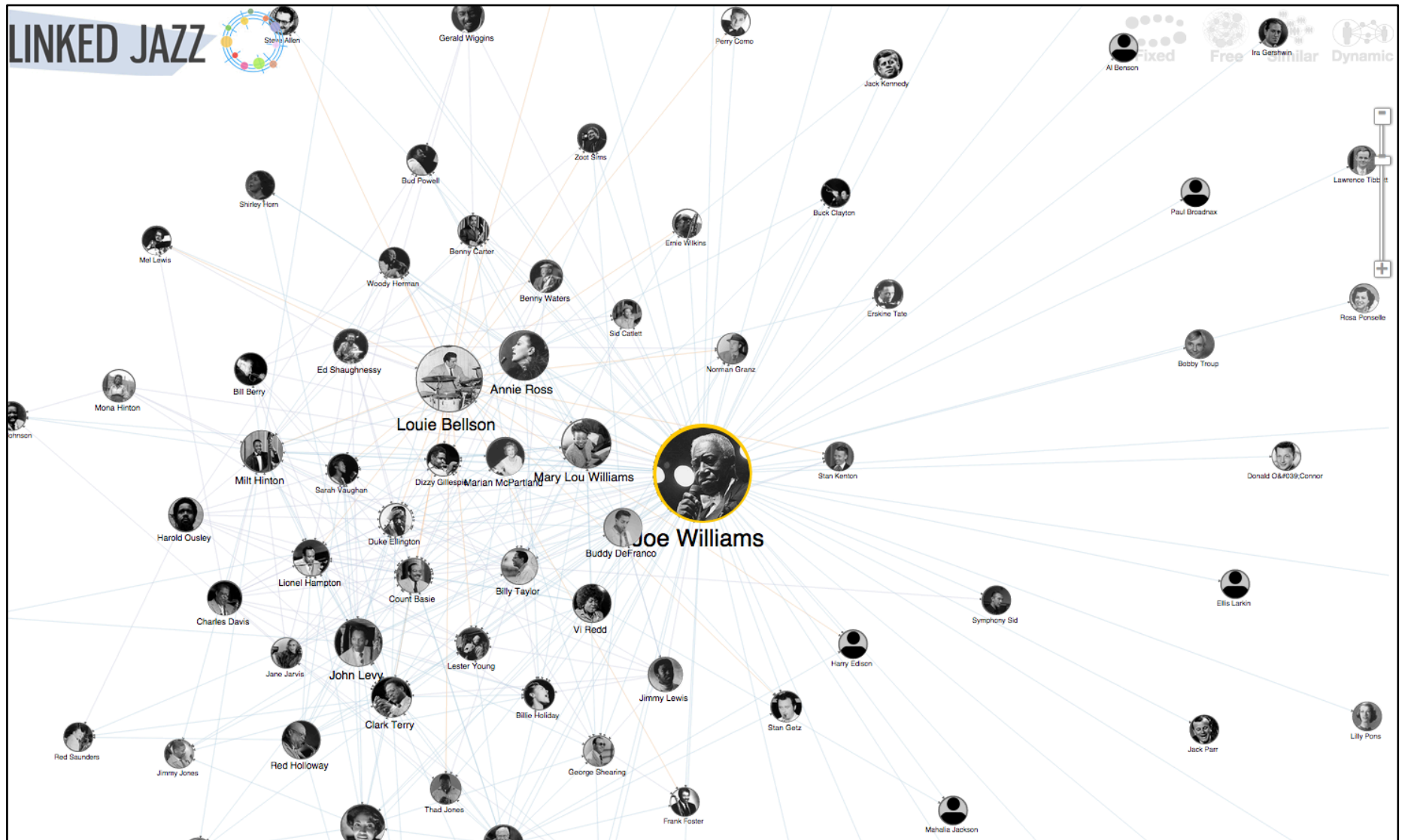
DIVE

The screenshot displays the DIVE interface with three search results. Each result includes a title, a count, a filter bar, and a set of icons representing different types of data or actions.

- REGETS** (499): Includes a portrait of a man. Filter bar: 500 relations, 112, 96, 98, 81, 112, 1.
- ARNHEM** (34): Includes the logo of the University of Arnhem. Filter bar: 34 relations, 14, 5, 6, 6, 3, 0.
- BRANDWEER SPOEDT WEG** (3): Includes a video player showing a fire scene. Filter bar: 3 relations, 0, 1, 1, 0, 1, 0.

<http://dive.beeldengeluid.nl/>

Network Visualization: *Linked Jazz*



<https://linkedjazz.org/>

OCLC and The European Library

- LD-driven access to multiple sources, faceted search/browse, and more

The screenshot shows the search results for 'derida' on The European Library website. The interface includes a search bar with the query 'derida', navigation tabs for 'Everything', 'Newspapers', 'Collections', 'Full text', and 'Remote Search', and a 'REFINE' section with filters for Accessibility, Discipline, Language, Contributor, and Collection. A 'YEAR OF PUBLICATION' bar chart shows two bars for the years 1990 and 2010. A 'COUNTRY OF CONTRIBUTOR' map shows the distribution of results across various countries.

Home → Search for "derida"

Everything Newspapers Collections Full text Remote Search

Related Concepts: [Jacques Derrida \(Person\)](#) More...

You are looking at 20 items out of 38 for **derida** (total time: 1.374 seconds)

[A Derida reader](#)
National Library of Czech Republic
Jacques Derrida (Peggy Kamuf)
New York: Columbia University Press, 1991
[At Contributor](#) ↗

[Haideggä-to-Derida](#)
German National Library
Herman Rapaport
Tōkyō: Hōsei Daigaku Shuppanyoku, 2003
[At Contributor](#) ↗

[Glasät na Žak Derida](#)
Bavarian State Library
Jacques Derrida; Ivajlo B. Znepolski
Sofija: Dom na Naukite za Čoveka i Obšttestvoto, 2003
[At Contributor](#) ↗

[Derida, Kristeva, and the dividing line](#)
The British Library
Julia. De Nooy
New York ;; Garland, 1998
London
[At Contributor](#) ↗

[Derida Dance Centre - първият център за съвременен танц в България](#)
National Library of Bulgaria
Живко. Желязков (Зорница. Каменова)
2010
[At Contributor](#) ↗

[Die Souveränität der Kunst : ästhetische Erfahrung nach Adorno und Derida](#)
National Library of France
Meinke, Christoph (1958-)

REFINE

Search within results **GO**

Accessibility ▾
At Contributor (33)
Access Online (7)

Discipline ▾
Language ▾
Contributor ▾
Collection ▾

YEAR OF PUBLICATION

GO

10
1
1910 1930 1970 1990 2010

Zoom

COUNTRY OF CONTRIBUTOR

World Europe Western Asia
Zoom

<https://www.oclc.org>
<http://www.theeuropeanlibrary.org/tel4/>

ResearchSpace

Projects Tools Dominic Bookmark web link in RS Databasket

ResearchSpace search

Dashboard Forum Rembrandt and 1606 - 1669 PDO10606 A young woman sleeping (Hendrickje Stoffels) PDO12496 The Last Supper, after an Italian drawing

Find all objects with images created/modified by Rembrandt and date interval 1606 - 1669 and created/modified by Rijksmuseum

Search Add To Data Basket Export Print

500 Results

List Thumbnails Timeline

Object Type

- 1 album
- 3 book-illustration
- 4 counterproof
- 182 drawing
- 1 forgery

Creator

- 9 Abraham Furnerius
- 3 Abraham van Dijk
- 2 Anonymous
- 2 Anthonie van Borssom
- 3 Anthony de Haen

Places

- 76 Europe
- 75 Gaul
- 75 France
- 75 Ile-de-France departement
- 75 Paris France
- 1 Netherlands

Created

- 1 1600-01-01
- 1 1625-12-31
- 3 1626-01-01
- 13 1626-01-01
- 1 1629

Technique

- 1 aquatint
- 182 drawn
- 90 drypoint

sorted by Title, then by...

Andromeda by Rembrandt

Anatole with a Bust of Homer by Rembrandt

Borststuk van een man met een gevederde baret by Rembrandt

Man in Oriental Costume by Rembrandt

PDO10606 A young woman sleeping (Hendrickje Stoffels);... by Dutch and Rembrandt

PDO12496 The Last Supper, after an Italian drawing;... by David Teniers the Younger, Flemish, and Rembrandt

PDO13552 Landscape with a road by an inn and a distant... by Lambert Doomer, Philips Koninck, Dutch, and Rembrandt

PDO13555 Landscape with a windmill on the banks of... by Philips Koninck, Dutch, and Rembrandt

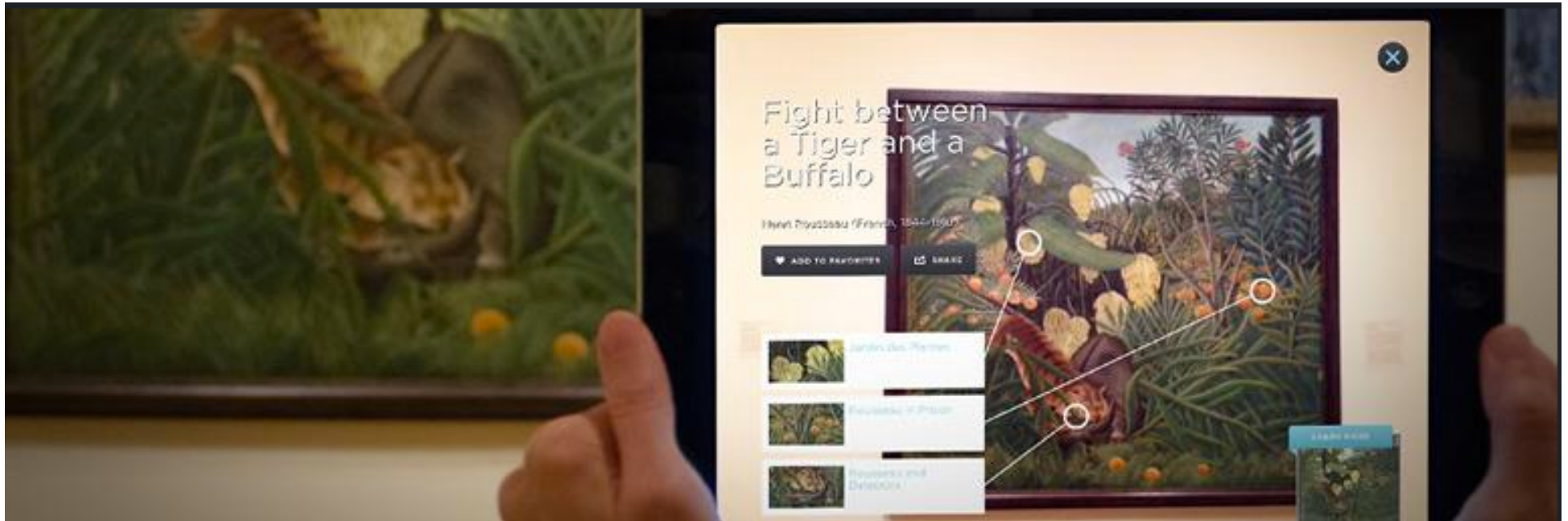
PDO13612 A horse lying down; with head to right, ... by Jan Lievens, Anonymous, Dutch, and Rembrandt

PDO13615 Seated old man; an academic nude, old man... by Abraham van Dijk, Jan Lievens, Dutch, and Rembrandt

<http://www.researchspace.org/>

Personalization and Federation

Cleveland Museum of Art "Gallery One"



Users take their selections with them through the museum's galleries

...but what if user selections were persistent and available to other applications?

Personalization and Federation

1



Phillips Collection

**Anonymous 19th Century
American c. 1880**

-Tropical Forest with Birds



National Gallery of Art

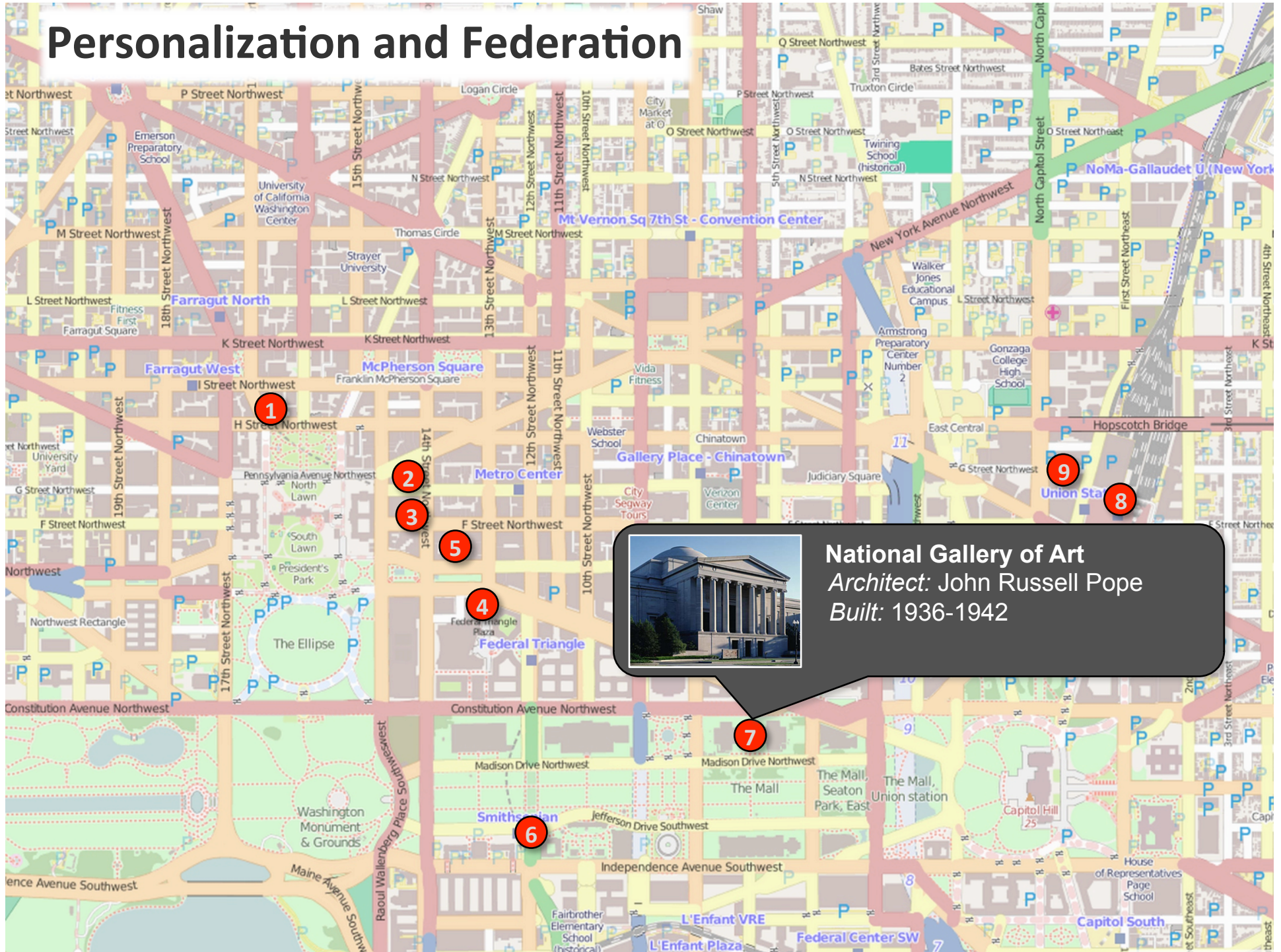
**Rousseau, Henri
French 1844-1910**

-Tropical Forest with Monkeys

-The Equatorial Jungle

2

Personalization and Federation



Historic Places LA (Arches Platform)

The screenshot displays the Los Angeles Conservancy website interface. At the top, there is a navigation bar with links for 'Sign in', 'DONATE', 'ABOUT', 'NEWS', 'CONTACT', and 'NEWSLETTER'. Below this is the organization's logo and a tagline: 'Preserving the historic places that make L.A. County unique. Learn More >'. A secondary navigation bar includes 'Explore L.A.', 'Events & Tours', 'Important Issues', 'What We Do', 'Get Involved', and 'Resources'. The main content area features a map of Los Angeles County with numerous black pins indicating historic sites. A popup window for 'Cox House' is open, showing a photograph of the building and a description by John Galbraith: 'A remarkable Mid-Century Modern residence that literally embraces the natural environment, so much so it's aptly nicknamed "The Tree House."'. Below the map is a search interface with fields for 'Keyword' (containing 'house'), 'Location' (containing '100'), and a distance unit dropdown set to 'Miles'. There are also dropdown menus for 'Architectural Style', 'Architect', 'Community', 'Decade', and 'Property Type', each with a 'Choose some options' button. 'Search' and 'Clear' buttons are at the bottom of the search area.

<https://www.laconservancy.org/>



VINCENT VAN GOGH

1853-1890

BIRTHPLACE:
ZUNDERT, NL

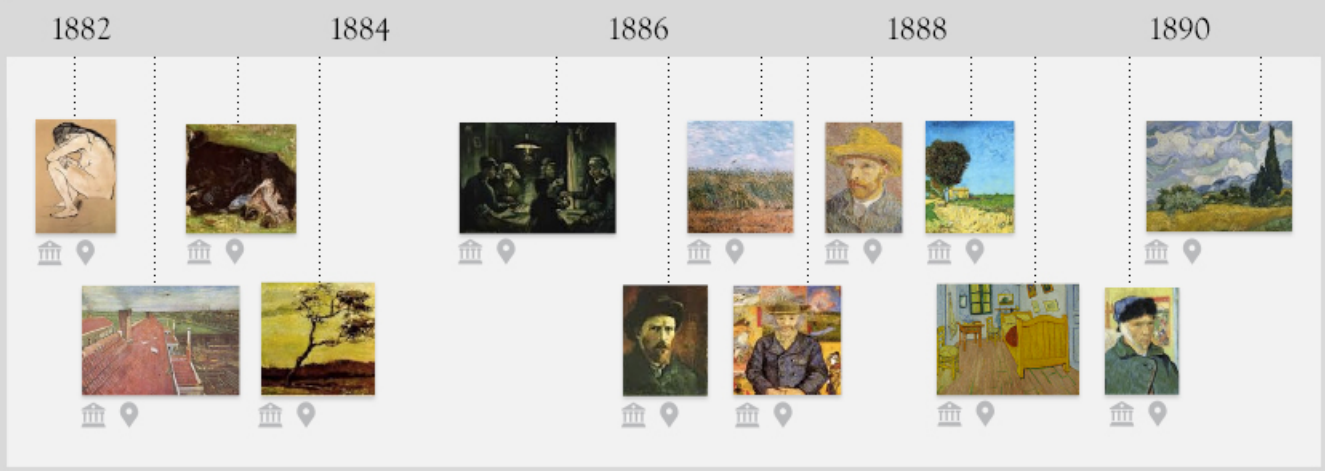
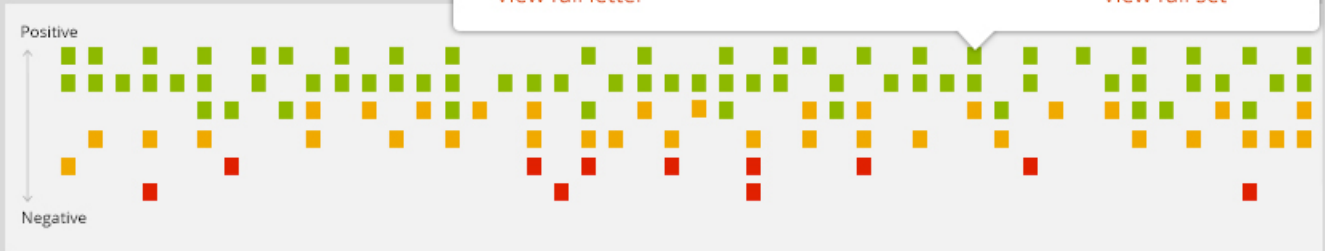
PLACES WORKED:
NUENE, ANTWERP,
PARIS, ARLES, [more...](#)

Letters from the artist provide insight into his mood. A sentiment analysis on those letters identifies the frequency of positive and negative sentiments expressed by the artist over time.



Letter to Paul Gauguin
Arles, Wednesday, 17 October 1888

[View full letter](#) [View full set](#)



Did van Gogh
suffer from depression?



1-Alex Ruger, Director
2- Arthur Wheelock, Curator
3- Abraham Bredius, Scholar

Measuring van Gogh's Mood



Bedroom in Arles
Vincent van Gogh
Painting, Oil on canvas
Arles: October, 1888

Sentiment analysis of Vincent's letters
challenges traditional thinking...



Explore van Gogh's moods

Letters from Theo to Vincent written 1885-1892

VINCENT VAN GOGH
1888-1890
ARLES, FRANCE

Letter to Theo van Gogh
Arles, Wednesday, 17 October 1888

1882 1884 1886 1888 1890

Who uses linked data effectively out in the world?

- ***Big Aggregators***

- Google knowledge graph
- Google Culture (emerging)
- FB open graph for embedding
- IBM Watson

- ***Companies***

- BBC
- Disney
- NBC SNL
- Best Buy
- Nature

- ***Open Data Repositories***

- DBpedia
- Freebase
- Wikidata
- Open Street Map
- Data.gov, data.gov.uk, etc.

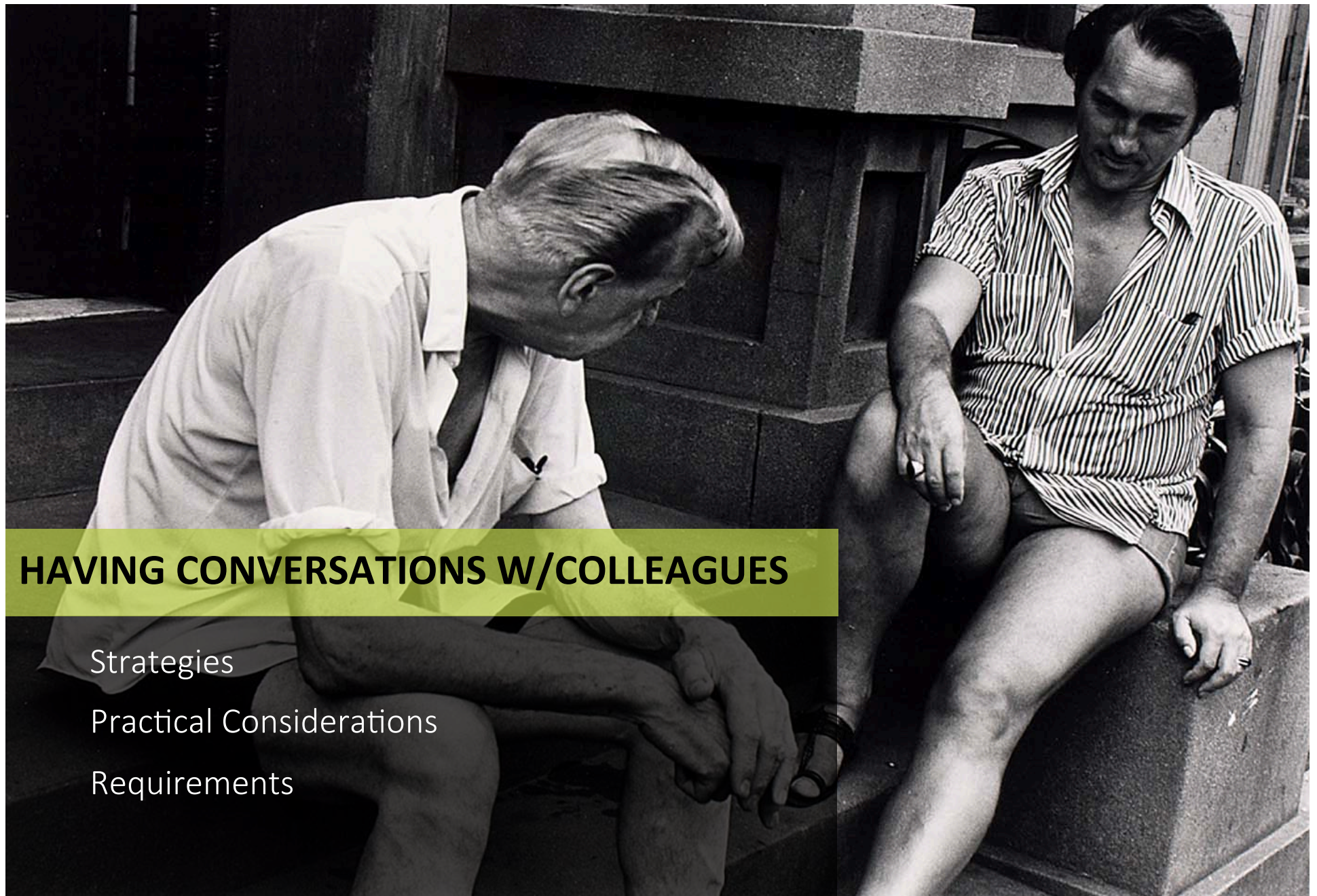
- ***Cultural Heritage***

- Europeana
- Various Dutch Institutions
- Yale Center for British Art
- Mellon ConservationSpace & ResearchSpace
- European Libraries
- IIF
- HistoricPlaces LA (Arches)
- Kultursampo

- ***Vocabularies***

- Getty
- Library of Congress Subject Headings (LCSH)
- OCLC
- GeoData

Not a complete list!



HAVING CONVERSATIONS W/COLLEAGUES

Strategies

Practical Considerations

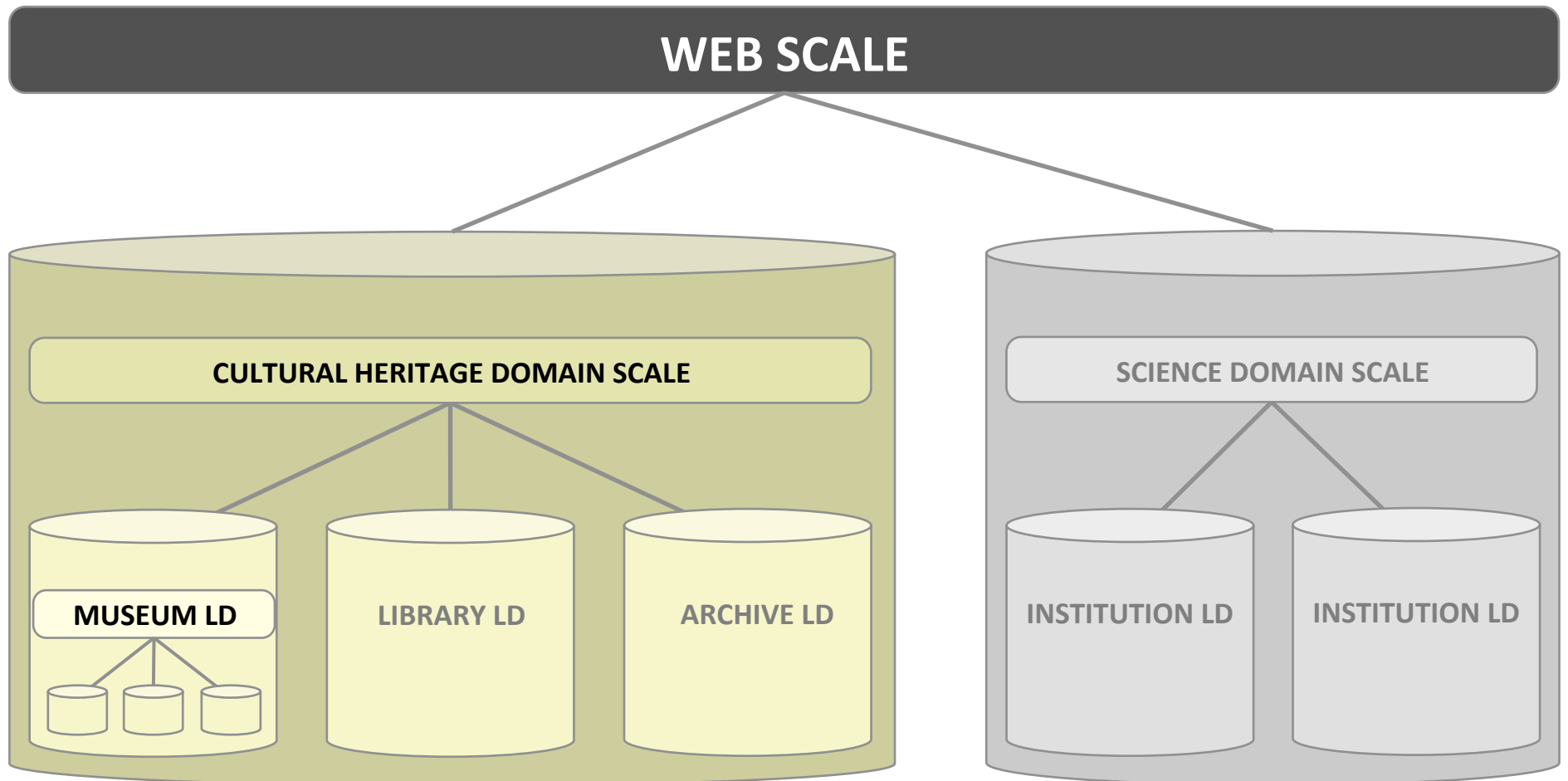
Requirements

William Suttle, "Untitled", 1938, Smithsonian American Art Museum <http://americanart.si.edu/collections/search/artwork/?id=23561>

HAVING CONVERSATIONS W/COLLEAGUES

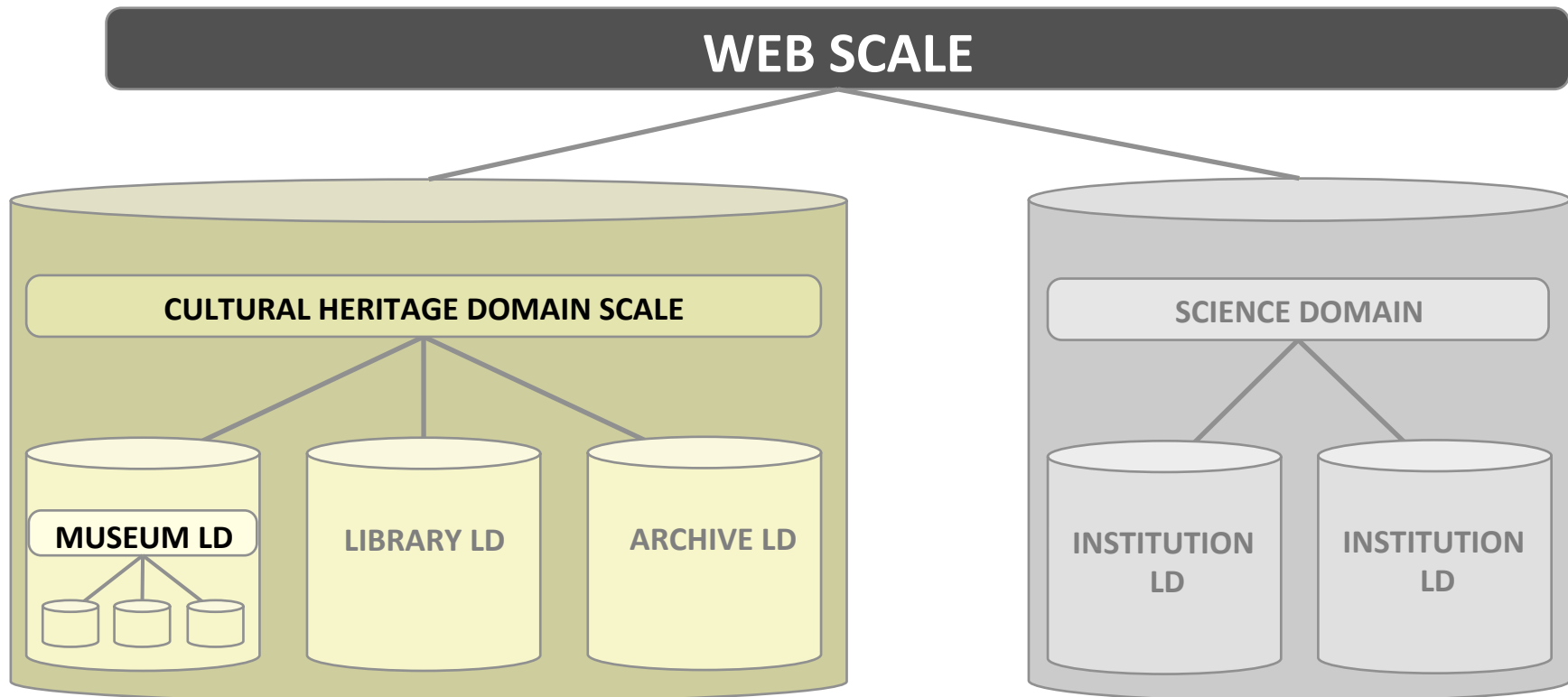
- Institutional strategies
 - Levels of influence and effect

Levels of influence and effect: *Gaining experience AND exposure*



Quick survey...

- What are your aspirations at this moment?
- What level of potential for LD do you see in your institutions in the near term? Long term?



HAVING CONVERSATIONS W/COLLEAGUES

- Institutional strategies
 - Levels of potential influence and effect
 - The Holy Grail: *5-star linked (open) data...and ease of integration*

Achieving 5-Star Linked (Open) Data

★ **1-star:** make stuff available on the Web (any format) under open license

★★ **2-star:** make it available as structured data (e.g., Excel)

★★★ **3-star:** use non-proprietary formats (e.g., CSV instead of Excel)

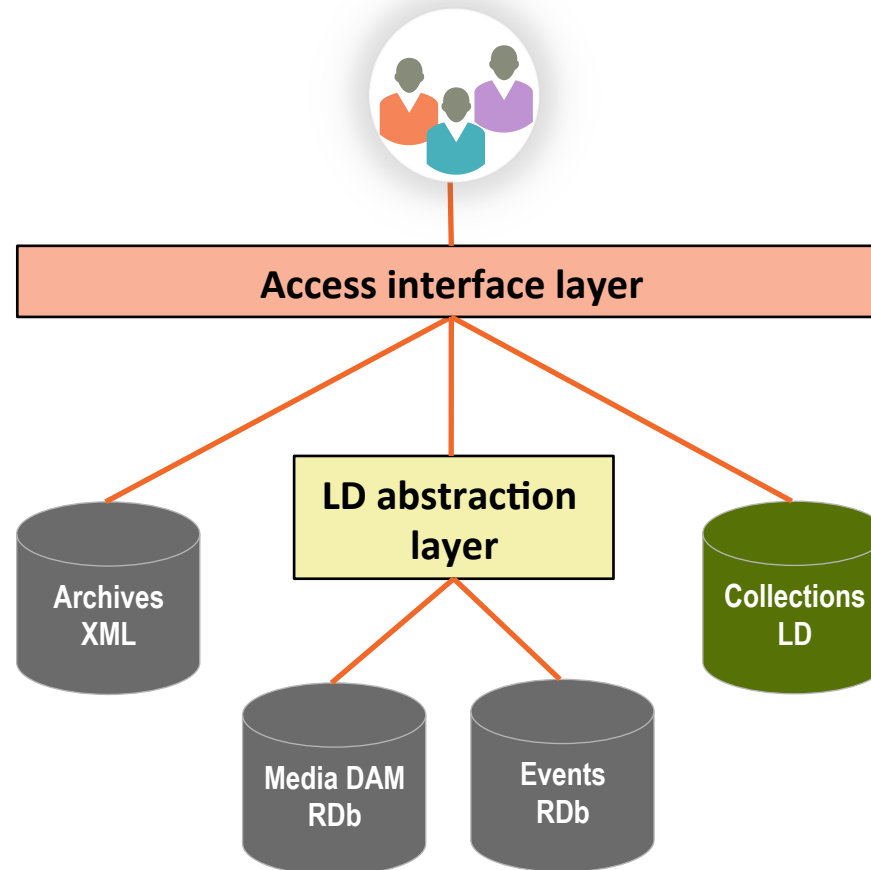
★★★★ **4-star:** use URIs to denote things, so people can point at your stuff

★★★★★ **5-star:** link your data to other data to provide context

Achieving 5-Star Linked (Open) Data

- You can achieve 5 stars incrementally...but keep your eyes on the prize!
- There's some value in achieving only 1–3 stars
- You can target your star goals uniquely for each content type depending on:
 - Complexity (e.g., structured vs. semi-/unstructured)
 - Resource availability
 - Internal
 - 3rd party linked data resources to be linked to/from
 - Program requirements

Linked Data can be *flexibly* adopted and integrated

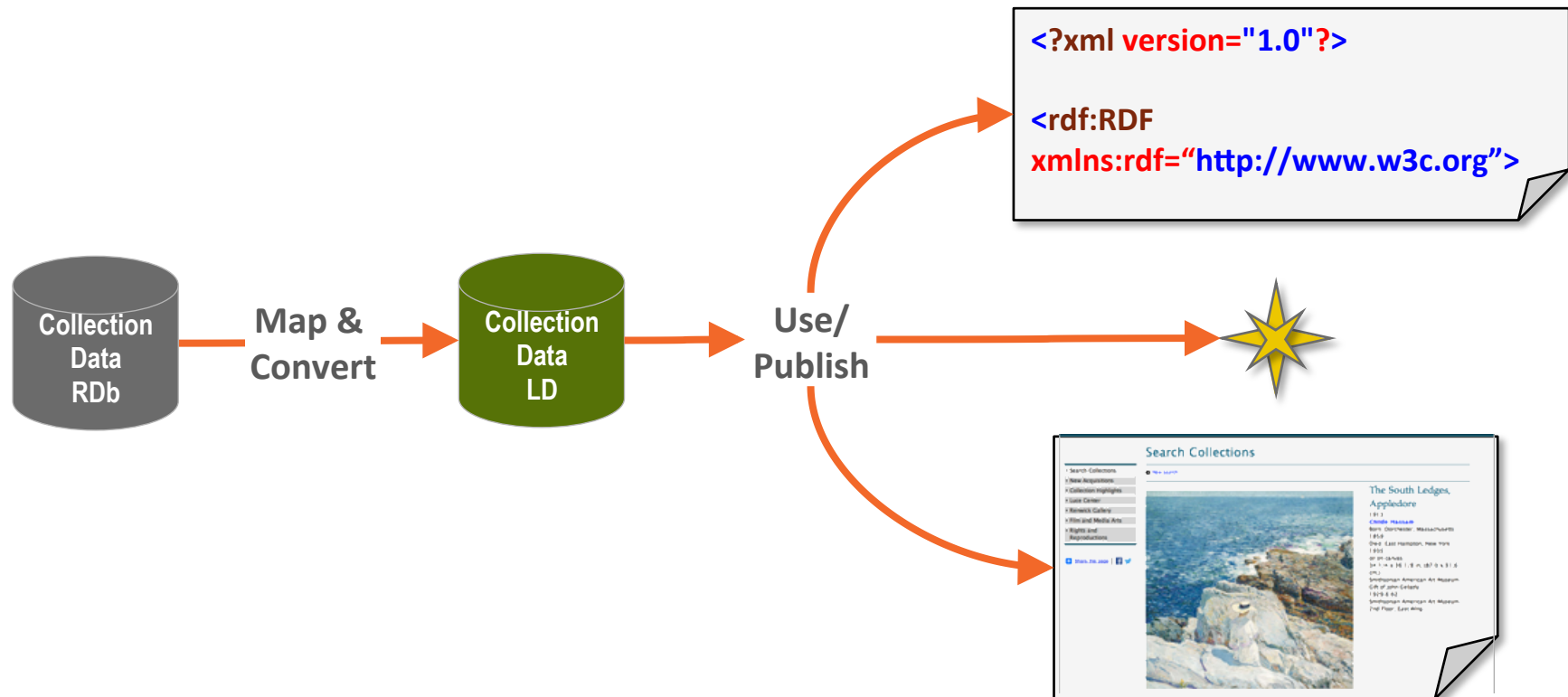


HAVING CONVERSATIONS W/COLLEAGUES

- Institutional strategies
 - Levels of potential influence and effect
 - The Holy Grail: *5-star linked (open) data*
 - Inclusion of a range of data sources

Most start with structured collection data/media

- Mapping & converting
- Publishing
- Maintaining



How broad a range of data is useful and feasible?

- Tombstone and broader collections data
- Other semi-structured and unstructured data
 - *Provenance*
 - *Constituents*
 - *Exhibitions*
 - *Conservation*
 - *Research files*
 - *Video, audio*
 - *Interviews*
 - *Manuscripts*

What else?

Benefits for sourcing data of all types

- *Break down silos*
 - Simplified access across data collections
 - Visibility into the sum total of “meaning” you’ve created
- *Enable structural consistency*
 - Ease of construction and inspection when creating or updating the data
 - Conform to industry standards
 - Ease of reuse in publishing
- *Normalize entities (people, organizations, etc.) and dates*
 - Standardize vocabularies across your data contains entities
 - Use dates in calculations, information visualization
- *Add depth to your LD holdings*
 - More resources you can search across and publish to the world

Supplementing technologies

- Enhancing data
 - Annotation
 - Inferencing and semantic search engines
- Converting unstructured data to structured data
 - Natural language processing and text parsers
 - Artificial intelligence, machine learning and automated analysis
 - Entity and concept extraction to support vocabulary enhancement

Supplementing technologies

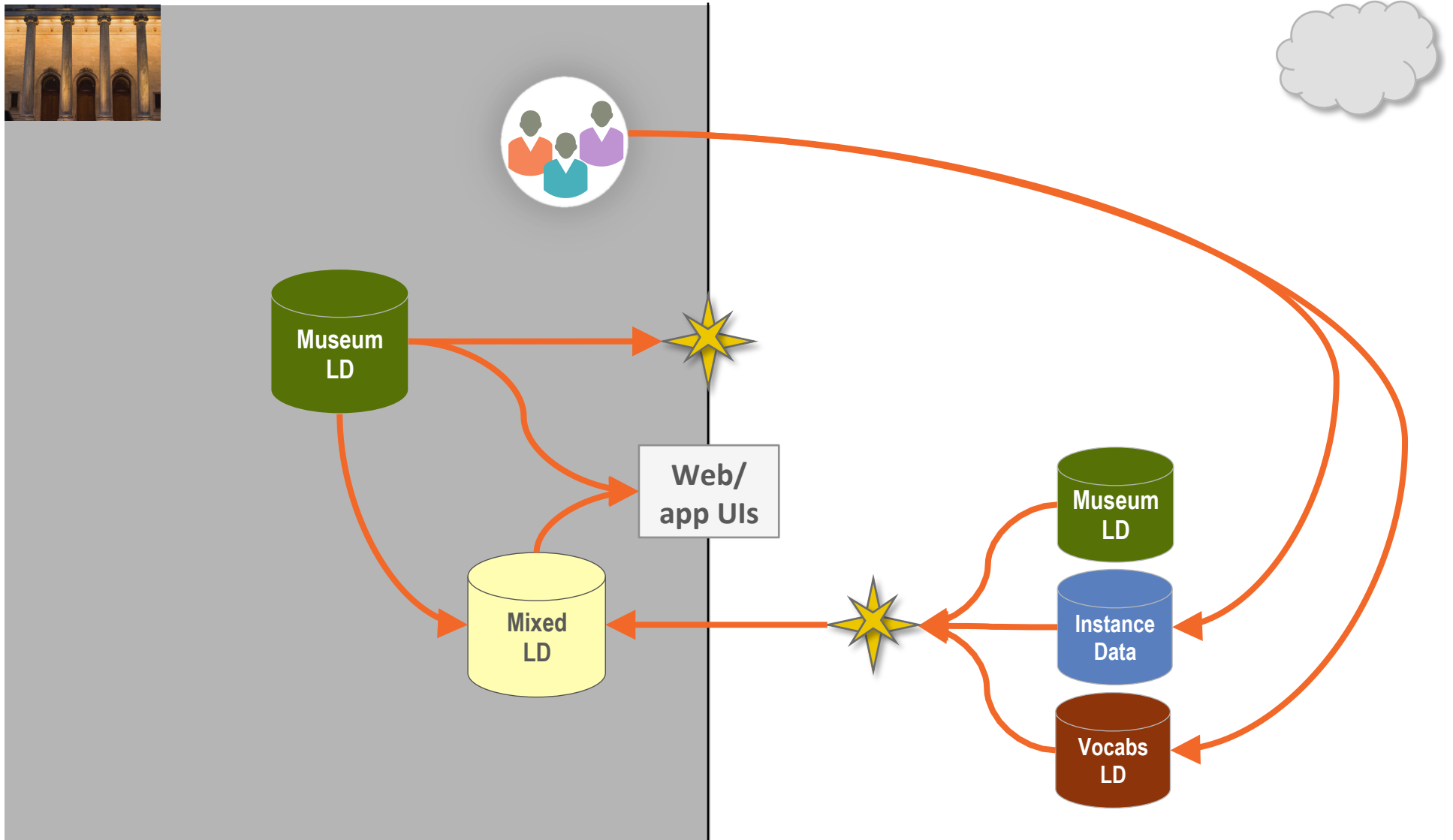
- Managing
 - Content management
 - Content presentation
 - Persistent URL formats and management services
 - Image management and addressing
 - Terminology management and shared vocabularies/libraries
- Visualizing data
 - Information visualization
 - Interface and application frameworks

HAVING CONVERSATIONS W/COLLEAGUES

- Institutional strategies
 - Levels of potential influence and effect
 - The Holy Grail: *5-star linked (open) data*
 - Inclusion of a range of data sources
 - Institutional role in LD production, consumption, collaboration

Roles to play in the LD community

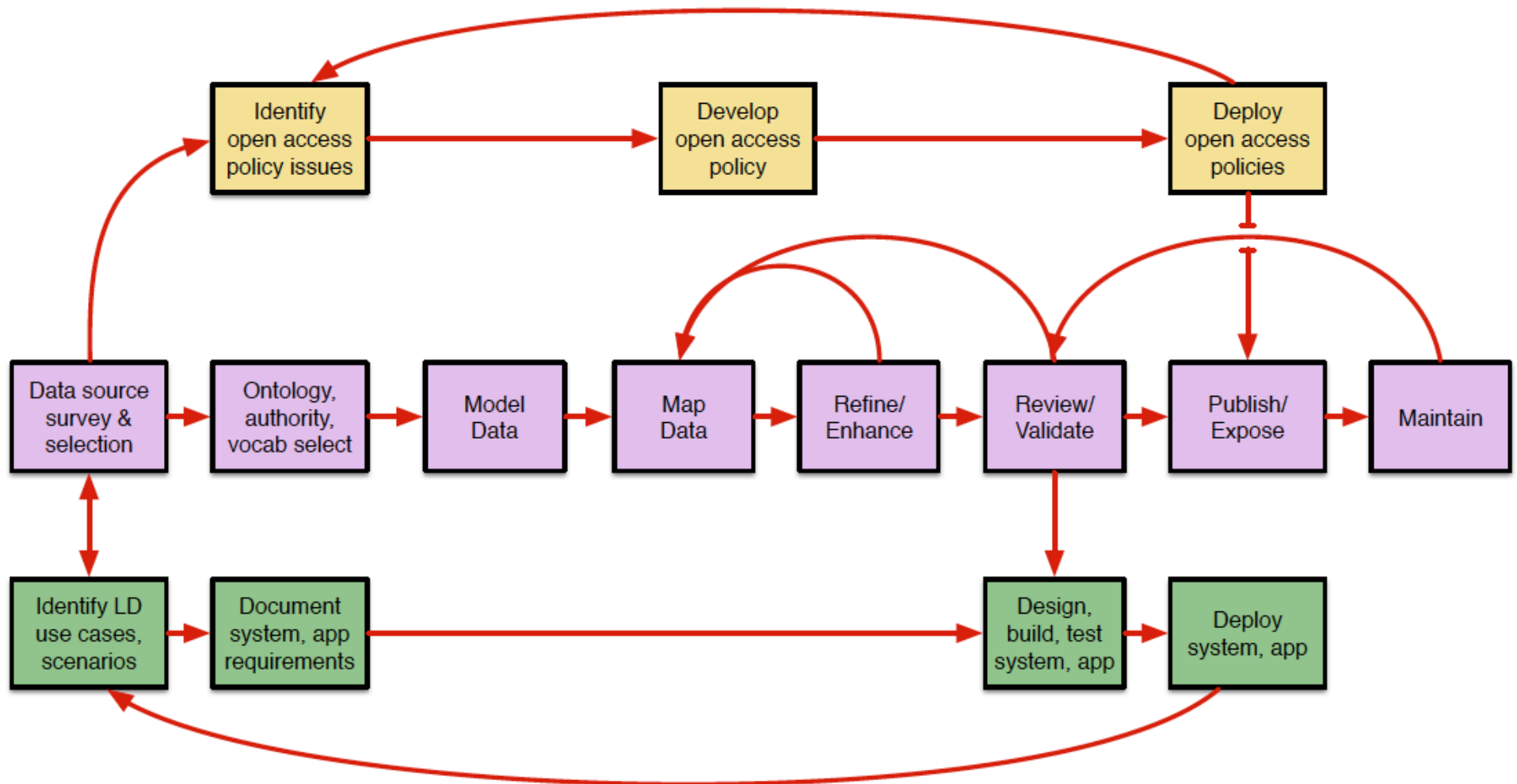
Producer – Consumer – Collaborator



HAVING CONVERSATIONS W/COLLEAGUES

- Institutional strategies
 - Levels of potential influence and effect
 - The Holy Grail: *5-star linked (open) data*
 - Inclusion of a range of data sources
 - Institutional role in LD production, consumption, collaboration
 - LD Lifecycle: *A process, not a project*

Linked Data Lifecycle



HAVING CONVERSATIONS W/COLLEAGUES

- Institutional strategies
 - Levels of potential influence and effect
 - The Holy Grail: *5-star linked (open) data*
 - Inclusion of a range of data sources
 - Institutional role in LD production, consumption, collaboration
 - LD Lifecycle: *A process, not a project*
 - LD design and implementation requirements

LD design and implementation requirements

- **Discovery & Serendipity**
 - Discover relevant information objects – known and unknown – through search/browse (and foster that serendipitous, “A-ha!” moment)
- **Extend use**
 - Take away information objects relevant to my interest
 - Conveniently re-use information in my own work products
- **Persistence**
 - Conveniently link/reference my work and source information objects
 - Trust that information objects to which I link/reference will remain available
- **Sustainability**
 - Flexibility in design and data modeling to adapt to future capabilities and topics
- **Scalability**
 - Comfortably adapt to ever-growing collections and different working styles across institutions

HAVING CONVERSATIONS W/COLLEAGUES

- Institutional strategies
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 - LD Lifecycle: *A process, not a project*
 - LD design and implementation requirements

Exercise

- Jot down basic ideas for a programmatic use of linked data in your own institution.
- Presume no constraints... you have all the data, money, personnel, and time you need
- Don't over elaborate or get hung up on question of medium/platform
- Focus on one of: Internal, partnership/public program, blue sky
- What data would be required?
- What problems would it solve?
- Get into groups and share your ideas. The group discusses and enriches the idea.



HAVING CONVERSATIONS W/MANAGEMENT

Reliability

Efficiency

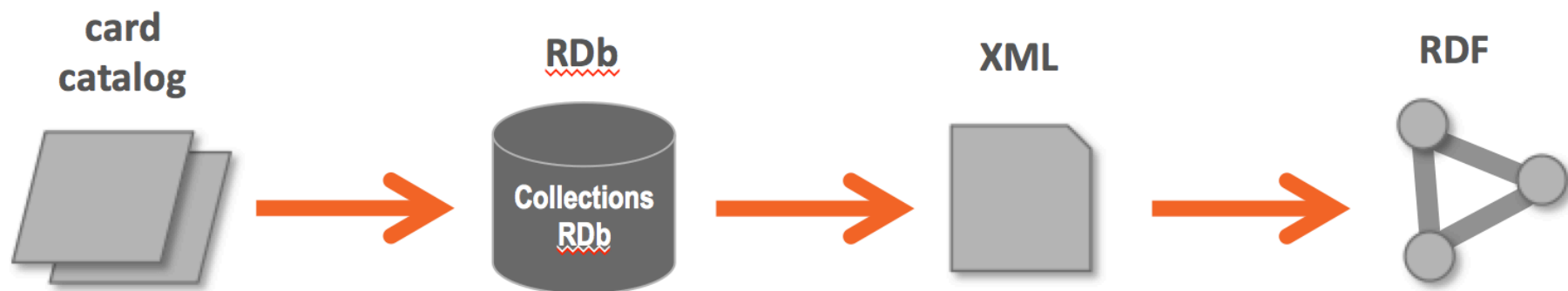
Legacy

Reach

Bartholomeus van der Helst, *The Governors of the Kloveniersdoelen*, Amsterdam Museum <http://www.amsterdammuseum.nl/>

HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
 - A next-generation data standard

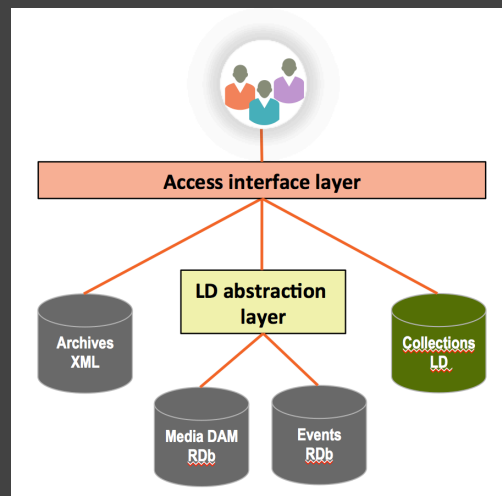


HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
 - A next-generation data standard
 - An active, world-spanning community

HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
 - A next-generation data standard
 - An active, world-spanning community
 - Flexibility in adoption, integration, change management



HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
- Do more with your content
 - Eliminate silos
 - Avoid one-off single-use content and applications, encourage re-use
 - Manage content more effectively
 - Improve analytical capability

HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
- Do more with your content
- Enhance the museum experience
 - Increase discoverability and serendipity (e.g., enhance scholarship)
 - Push the boundaries on interaction
 - Serve existing audiences better and attract new ones
 - Bridge the physical and digital realms

HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
- Do more with your content
- Enhance the museum experience
- A pioneering opportunity
 - Demonstrate leadership, define a legacy
 - Exercise a spirit of adventure and discovery

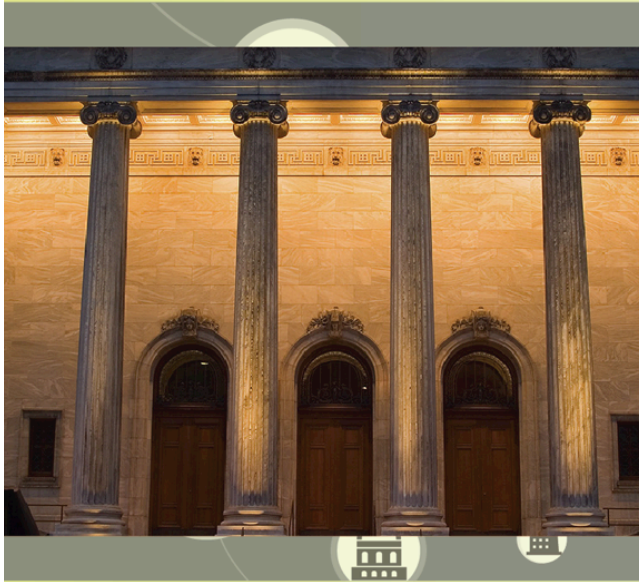
HAVING CONVERSATIONS W/MANAGEMENT

- Maturity, flexibility, and a critical mass of participants
- Do more with your content
- Enhance the museum experience
- A pioneering opportunity
- Increase your reach
 - The promise and challenge of “openness”
 - Visibility and authority in your community and at web scale
 - Enhance and extend institutional relationships

INSTITUTION

INFORMATION PARTNERSHIPS

CULTURAL ECOSYSTEM



Create

Effectively manage and use your data

Extend

Share data seamlessly among partners

Enrich

Integrate with broader humanities and societal data

The value propositions for linked data

- **Maturity, flexibility, and a critical mass of participants**
 - A next-generation data standard
 - An active, world-spanning community
 - Flexibility in adoption, integration, change management
- **Do more with your content**
 - Eliminate silos
 - Avoid one-off single-use content and applications
 - Manage content more effectively
 - Improve analytical capability
- **Enhance the museum experience**
 - Increase discoverability and serendipity
 - Push the boundaries on interaction
 - Serve existing audiences better, attract new ones
 - Bridge the physical and digital realms
- **A pioneering opportunity**
 - Demonstrate leadership, define a legacy
 - Exercise a spirit of adventure and discovery
- **Increase your reach**
 - The promise and challenge of “openness”
 - Visibility and authority in your community and at web scale
 - Enhance/extend institutional partnerships



LET'S GET TO WORK!

Please fill out your evaluations

Please contact us with questions

Workshop resources will be made
available online

Pierre Puvis de Chavannes, "Work", c 1863, National Gallery of Art <http://www.nga.gov/content/ngaweb/Collection/art-object-page.1194.html>

How, When, and Why to use Linked Data

Starting and Sustaining an Institutional Conversation

Museums and the Web: 8 April 2015



Design for Context

Making software applications and web sites easy to use
www.designforcontext.com

Duane Degler

🐦 @ddegler

✉ duane@designforcontext.com

Neal Johnson

🐦 @vanWinkleTunes

✉ neal@designforcontext.com