

Innovative Applications And Data Sharing With Linked Open Data In Museums

Museums & the Web • April 19, 2017

bit.ly/mw17dfc



Design for Context

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

Duane Degler

🐦 @ddegler

*With contributions from Neal Johnson,
Joan Cobb, Lesley Humphreys*

WHY ?

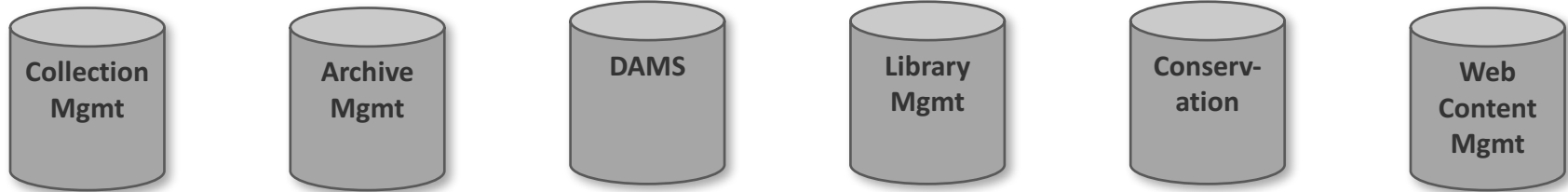
- ◆ Relationships
- ◆ Next generation of data
- ◆ Meaning . . . stories

Linked Open Data: Worse is Better

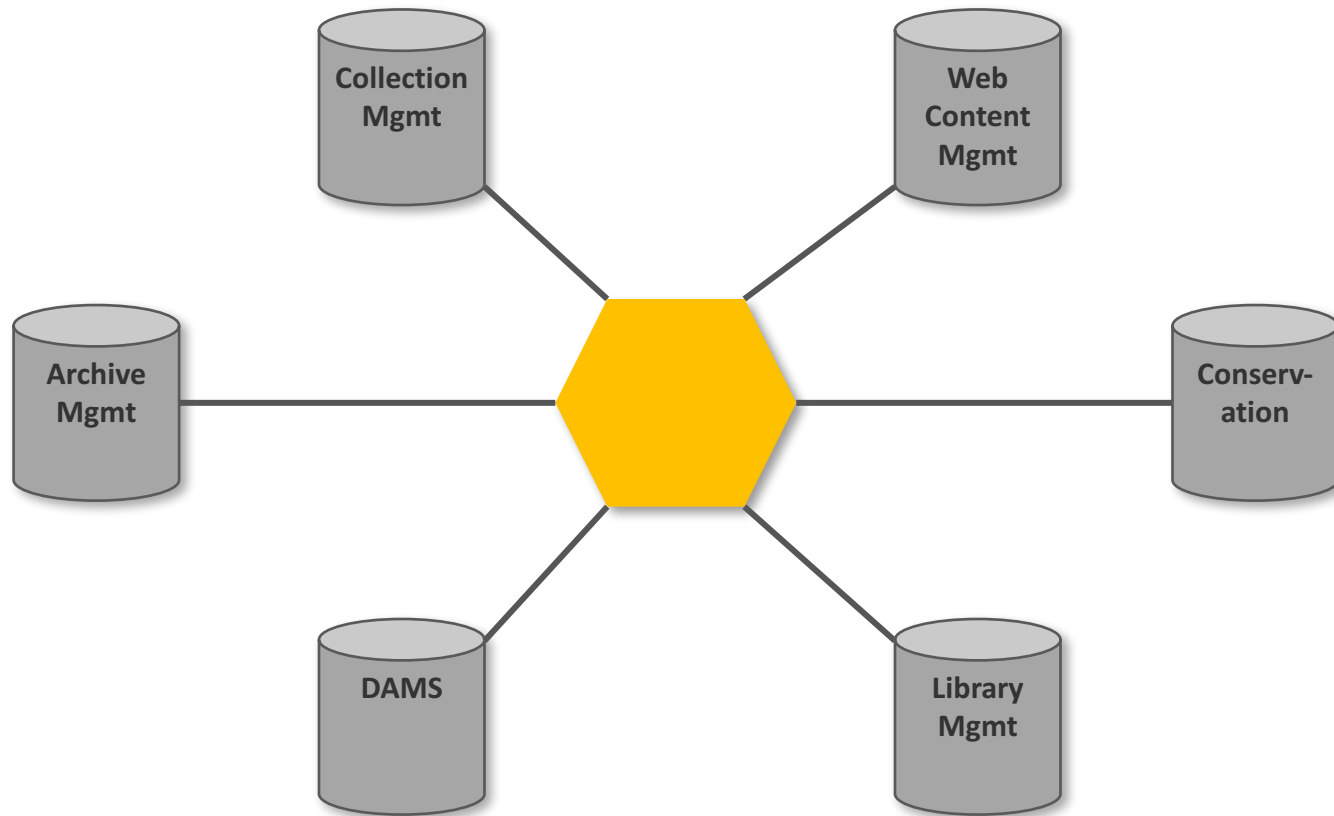
David Newbury: MCN Ignite Talk, 2016

<https://www.periscope.tv/MuseumCN/1yNGaAAwemVGj?t=3m29s>

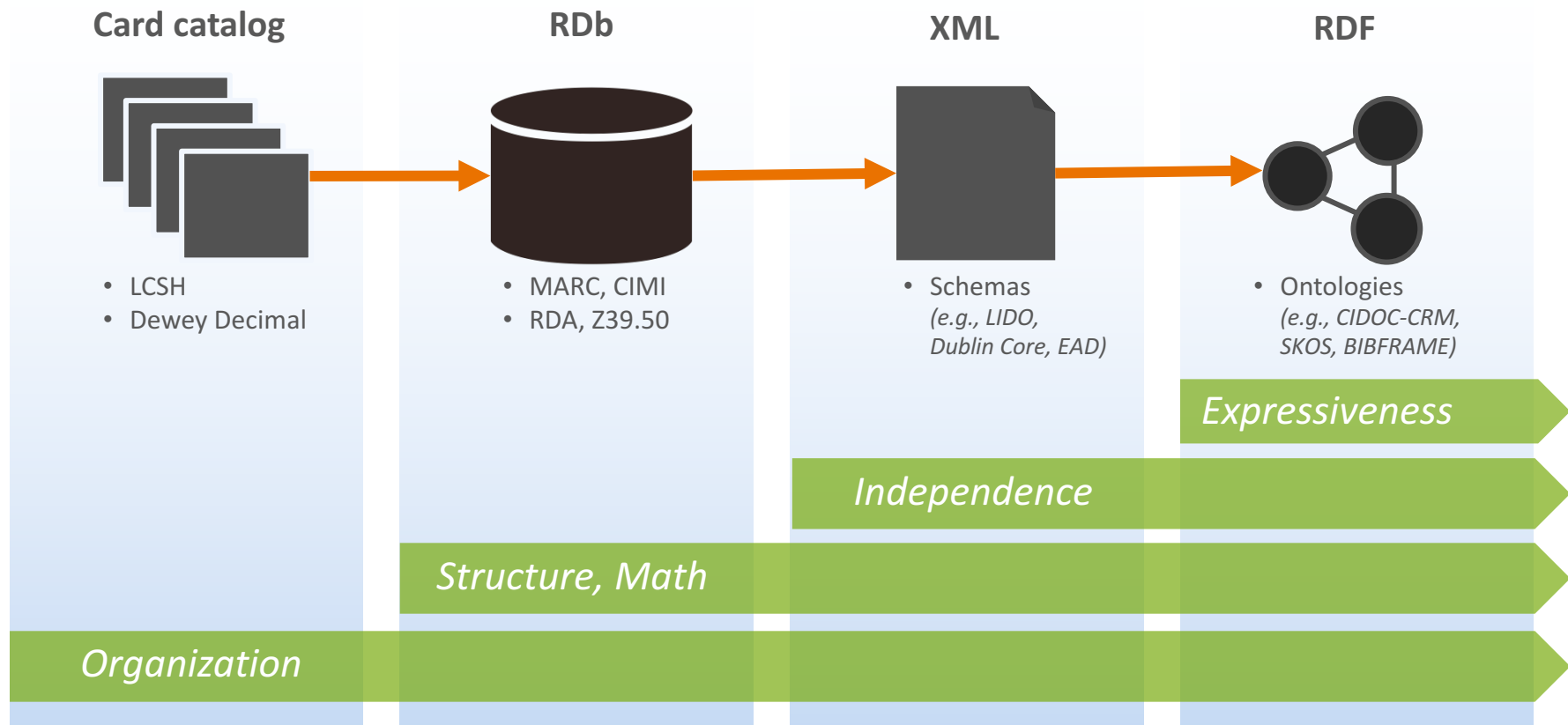
How do we get from this . . .



To this . . . ?



Linked Data is a “Next Gen” data standard



Open Memory Project

Centro di Documentazione Ebraica Contemporanea (CDEC) Foundation
LODLAM Challenge 2015 Winner

<http://summit2015.lodlam.net/2015/04/21/challenge-entry-open-memory-project>

Also: Contemporary Jewish Documentation Center in Milan
LOD Navigator: LODLAM 2017 entry

<https://summit2017.lodlam.net/2017/04/12/lod-navigator/#more-982>

Linked Data's value for cultural heritage

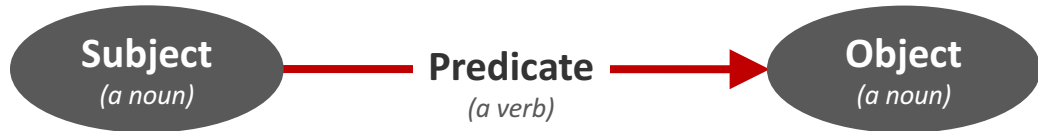
- Do more with my own content
 - Eliminate data/info silos
 - Enhance scholarship through improved access to information resources
 - Enhance the museum experience
 - Serve new audiences
 - Manage content and programs more effectively (fewer one-offs)
- Enhance/extend my institutional relationships
 - Combine your data/info resources with 3rd parties
 - Offer “open content” for easy reuse by others
 - Collaborate to create new resources

WHAT IS LINKED DATA ?

- ◆ Triples
- ◆ Ontologies
- ◆ Vocabularies
- ◆ Entities

The theory, part 1
...and some play time

Linked Data: “assertions” to create a “knowledge graph”



Georgia O'Keeffe

<http://contentdm.okeeffemuseum.org/cdm/singleitem/collection/gokfalid/746/rec/2>

— painted —→

<http://vocab.getty.edu/aat/300054216>



Calla Lily Turned Away (1923)

<https://www.okeeffemuseum.org/about-georgia-okeeffe/>

— has subject —→

<http://vocab.getty.edu/aat/300404126>

A screenshot of a botanical information page for *Calla*. The page includes a photograph of the plant, a conservation status section with a risk scale (GX to G5), and a scientific classification section listing Kingdom, Order, Family, Subfamily, Genus, and Species. The binomial name is *Calla palustris* L., and a list of synonyms is provided at the bottom.

Calla

Conservation status

Presumed Extinct: GX | At risk: GH, G1, G2, G3, G4 | Secure: G5

Secure (NatureServe)

Scientific classification

Kingdom: *Plantae*
(unranked): *Angiosperms*
(unranked): *Monocots*
Order: *Alismatales*
Family: *Araceae*
Subfamily: *Calloideae*
Genus: *Calla* L.
Species: *C. palustris* L.

Binomial name

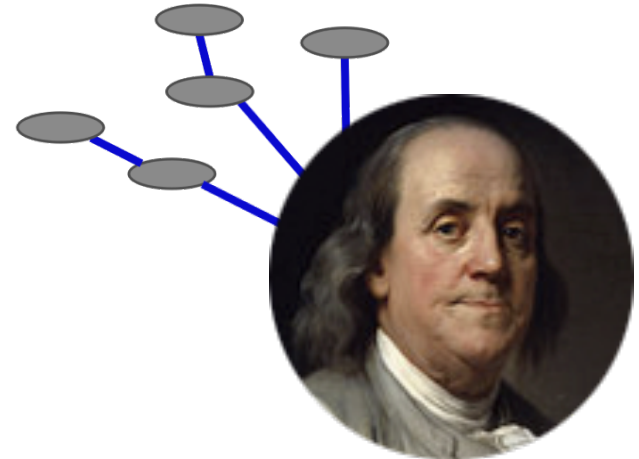
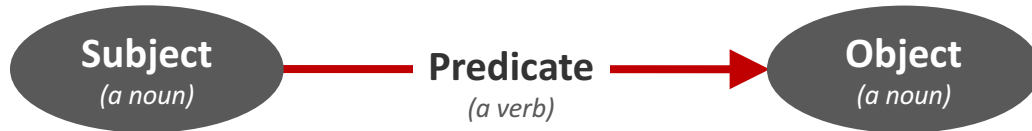
Calla palustris L.

Synonyms^[1]

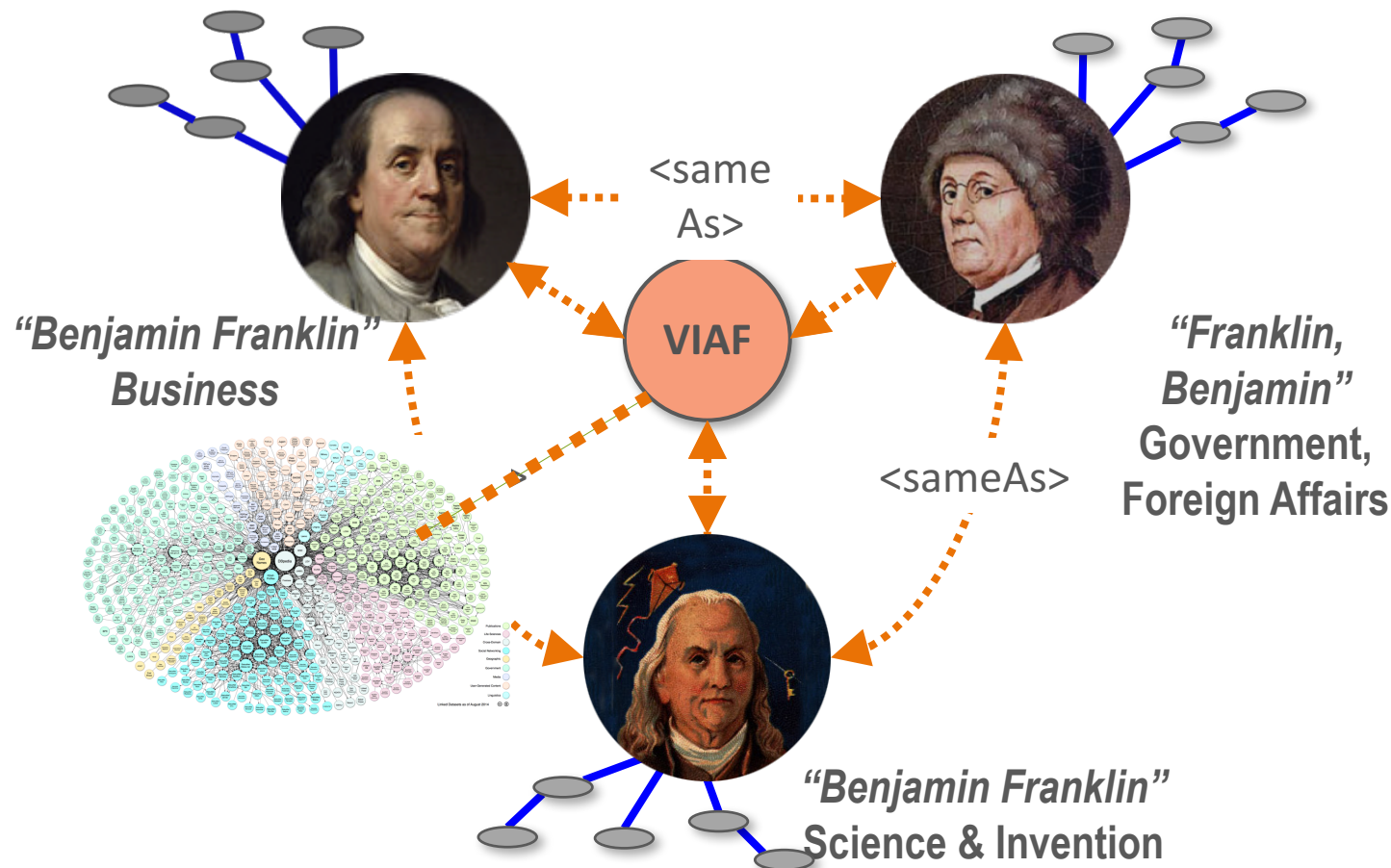
- *Callaria* Raf.
- *Aroides* Heist. ex Fabr.
- *Provenzalia* Adans.
- *Callaion* Raf.
- *Callaion palustris* (L.) Raf.

<https://en.wikipedia.org/wiki/Calla>

Creating Linked Data – exercise



Options for linking “Ben Franklin” knowledge graphs



Ben Franklin exercise takeaways

- Building consensus about names is a challenge
- Collaboration is fundamental
- You describe data in ways that suit your domain, yet flexibly connect your graph to others
- Linking graphs extends their utility...especially when shared authorities facilitate linking between domains
- If the authority links BACK to you it makes you part of the Linked Data Cloud
- Others may take advantage of the enlarged graph in ways you didn't instigate or expect.

WHAT CAN WE DO WITH IT ?

- ◆ Share
- ◆ Search > Browse > Serendipity
- ◆ Extend knowledge



International Image Interoperability Framework™

Enabling Richer Access to the World's Images

Learn how to get started

Schedule now online for the 2017 IIIF Conference, June 5-9, in The Vatican



Community Focused

The IIIF is driven by a community of research, national and state libraries, museums, companies and image repositories committed to providing access to high quality image resources.



Defined APIs

The IIIF is anchored by well defined Application Programming Interfaces developed and vetted by an open and rigorous community process.



Plug 'n' Play Software

The IIIF community encourages and supports the development of compatible image serving and viewing software that is easy to install and provides a dazzling user experience.

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

Remnants of Otto Ege MS 1, as of 2014



Image courtesy of Rob Sanderson, Stanford University

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

Otto Ege MS 1, Reconstructed, in 2014

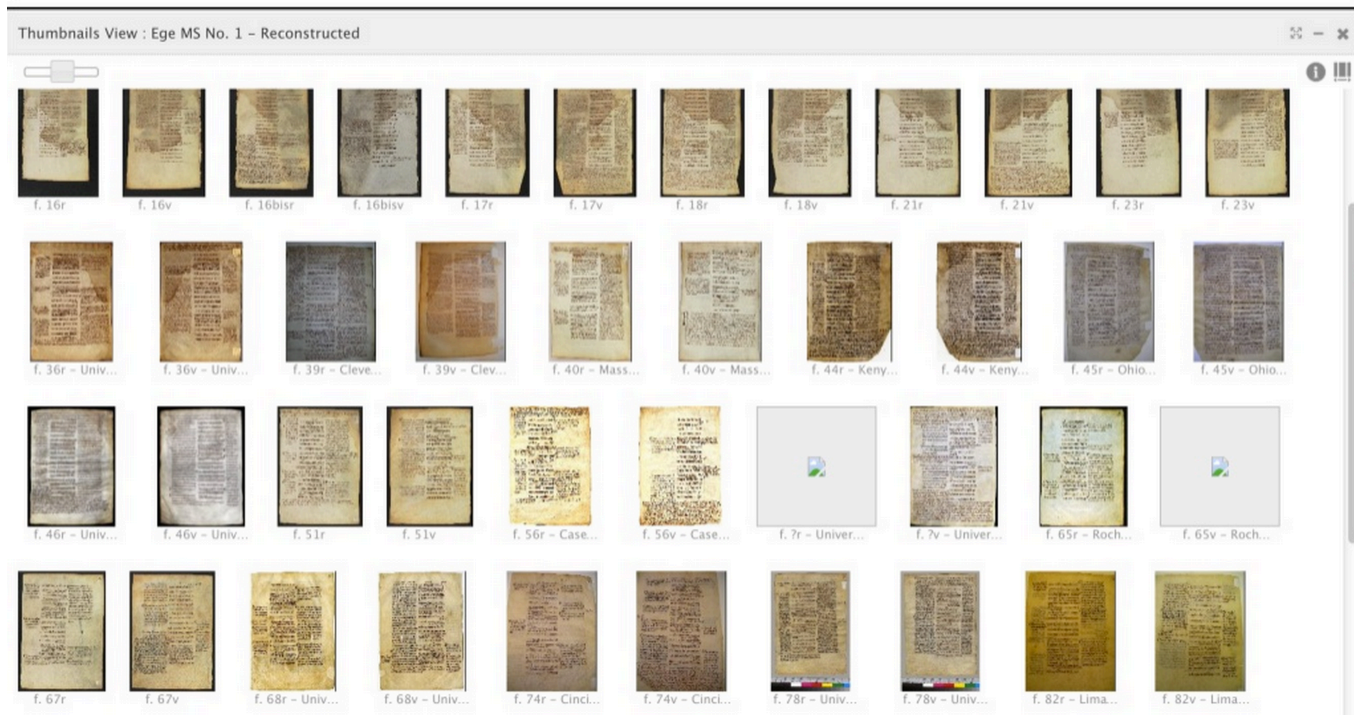
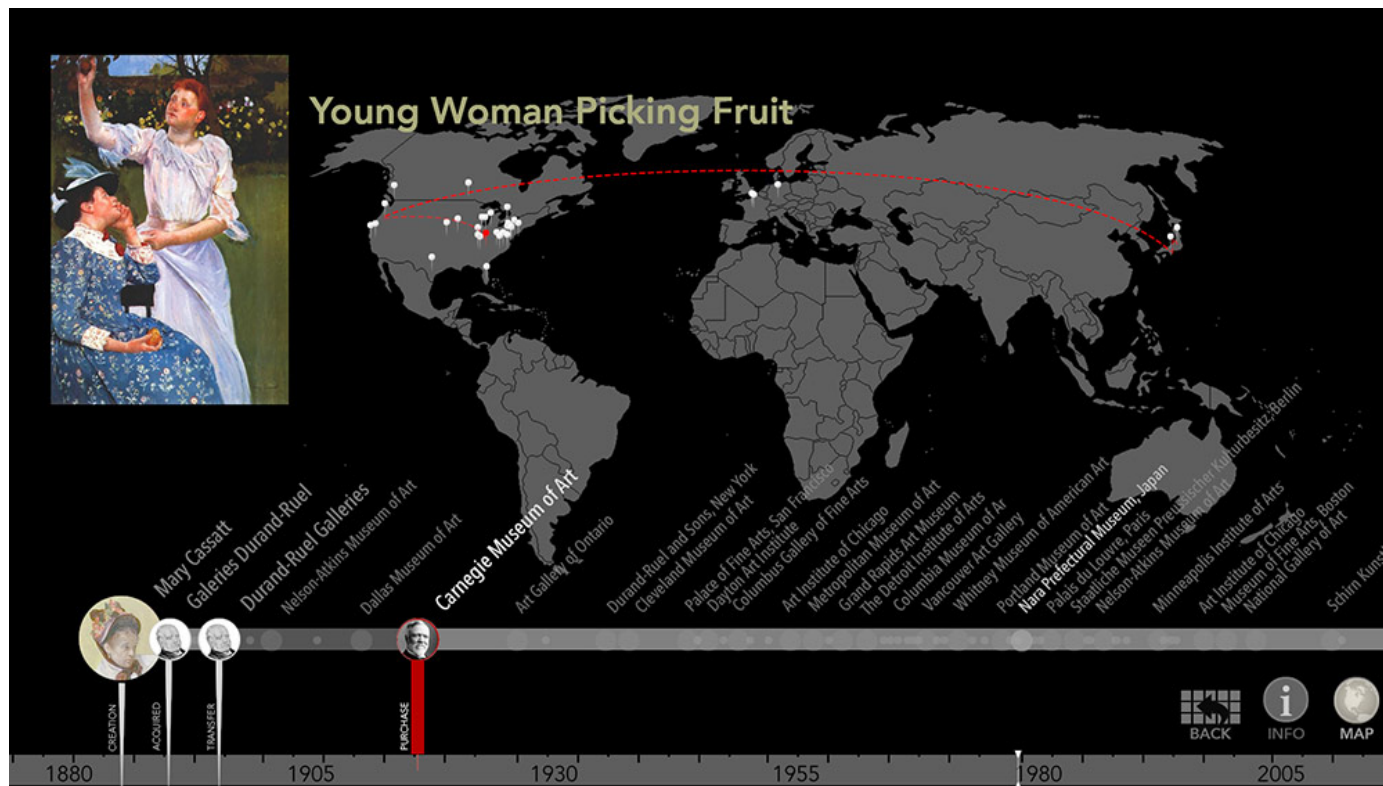


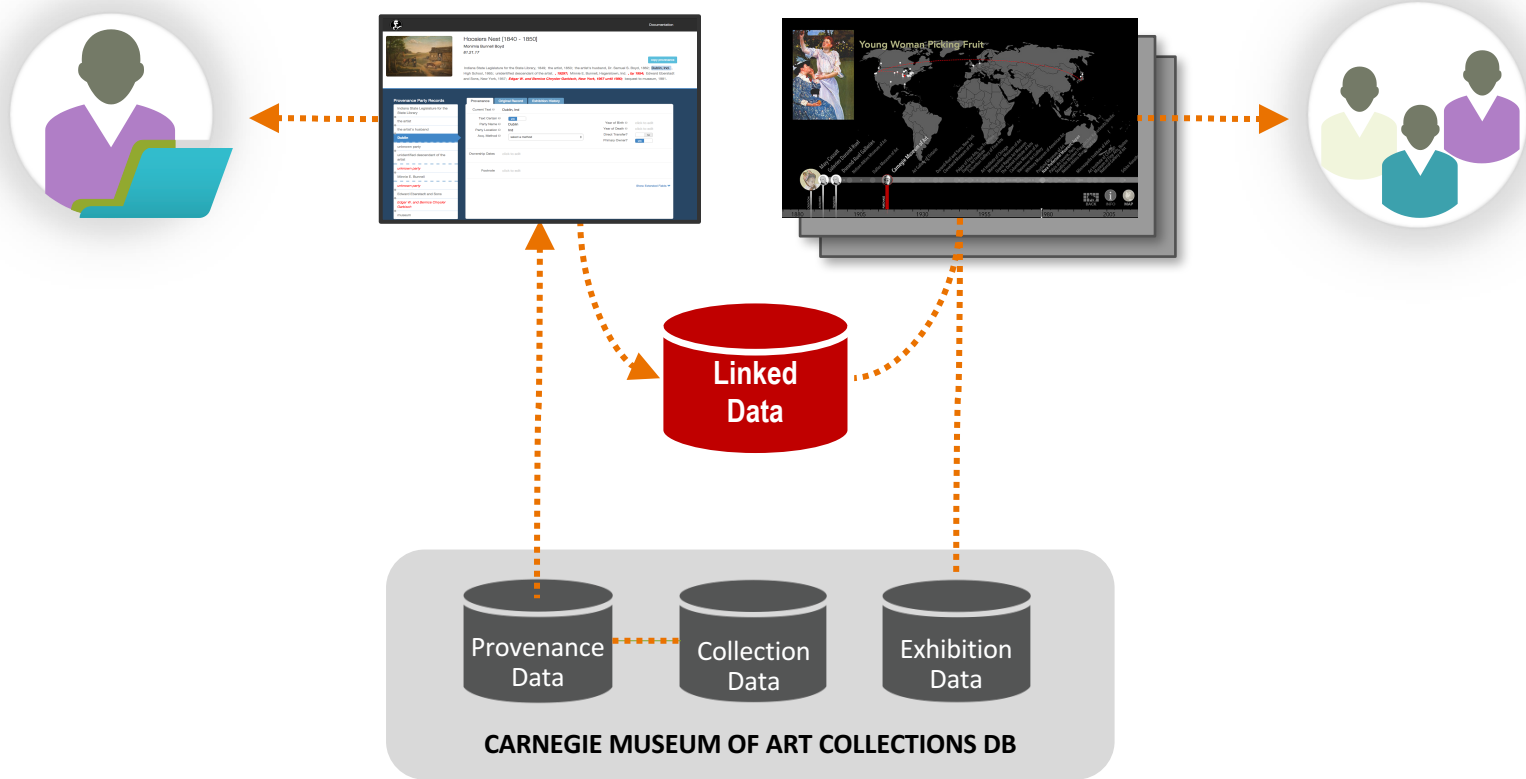
Image courtesy of Rob Sanderson, Stanford University

Carnegie Museum of Art program idea: Art Tracks



<http://museumprovenance.org>

Carnegie Museum of Art program idea: Art Tracks



Carnegie Museum of Art provenance app: Elysa



Young Women Picking Fruit [1891]

Mary Cassatt

22.8

copy provenance

Mary Cassatt [1844-1926]; **Possibly Galeries Durand-Ruel, Paris, France, by August 1892 [1]**; purchased by Museum, October 1922 [2]. Durand-Ruel Galleries, New York, NY, 1895.

NOTES: [1] Recorded in stock book in August 1892 [2] Updated by CGK July 2012.

Provenance Party Records

- Mary Cassatt
- Galeries Durand-Ruel**
- Museum
- Durand-Ruel Galleries

+ Add a Party

Provenance

Original Record Exhibition History

Original Text ⓘ Galeries Durand-Ruel, Paris, France, by August 1892

Current Text ⓘ **Possibly Galeries Durand-Ruel, Paris, France, by August 1892**

Text Certain ⓘ

Party Name ⓘ Galeries Durand-Ruel Year of Birth ⓘ [click to edit](#)

Party Location ⓘ Paris, France Year of Death ⓘ [click to edit](#)

Acq. Method ⓘ

Direct Transfer? yes

Primary Owner? yes

Ownership Dates by August 1892

Evolutionary model for provenance LOD

Tombstone Info

The core entities are the object, the creator(s), and the current owner. These are part of provenance, but are traditionally recorded outside of provenance.

Level 1: Basic Provenance

This documents a provenance text in which the individual entities contained within the document are not modeled in any fashion. This is the standard model for provenance within an institution where the provenance is merely a textual document.

Level 2: Provenance with Entities

This level adds mappings for parties, locations, and URLs contained within the document. The individual events and the connections between entities are not mapped.

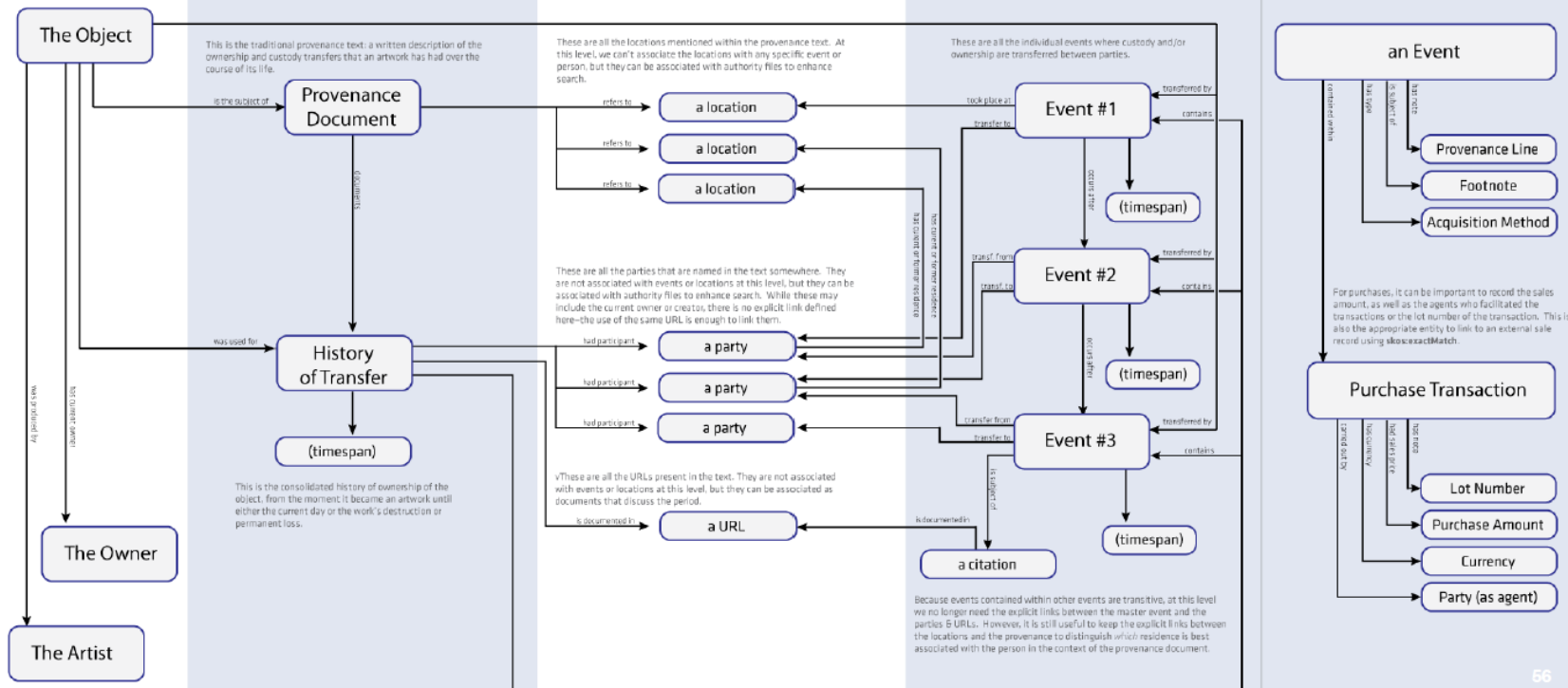
This accommodates software that processes the provenance text but doesn't understand the structure of provenance, such as Named Entity Recognition or reconciliation against authority files.

Level 3: Event-Based Provenance

This level of provenance documents the individual transfer events, or the individual "lines" of the provenance document. This will require a parser that understands the syntax of the document.




Level 3: Additional Information

There are additional items of information that should be included for each event beyond the relationships between people and time. These include documenting acquisition and textual information, as well as providing an association with sale and auction information.



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](#)




Image from Wikipedia

2 related collections

Anderson, Nicholas Longworth, 1838-1892




Image from Wikipedia

14 related collections

Bohm, Max, 1868-1923




Image from Wikipedia

18 related collections

Elsasser, Walter M., 1904-




Image from Wikipedia

9 related collections

Laurance, John, 1750-1810




Image from Wikipedia

3 related collections

Respighi, Elsa, 1894-1996




Image from Wikipedia

3 related collections




Image from Wikipedia

9 related collections

Brainerd, David, 1718-1747




Image from Wikipedia

7 related collections

Herring, Thomas, 1693-1757




Image from Wikipedia

2 related collections

Metz, Jamie Frederic





Image from Wikipedia

15 related collections

Robertson, William, 1721-1793




SHAKE-SPEARES

<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 Gender:	Authority Source: WorldCat, VIAF, LC Nationality: Language:
---	--

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)

Visualize:

[List collection locations](#)

[Radial Graph Demo](#)

[View source EAC-CPF](#)

Subjects:

- Painting, American
- Painting--Study and teaching

Occupations:

not available for this record

AAC – Browse Application

American Art Collaborative Demonstration Application

AAC Collections


INITIAL CONCEPTS (for discussion only)

About ACC My Settings Saved (7)

Institutions Explore Artists Explore by Categories Collection Profile

Georgia O'Keeffe

Sunset




This is a short description of this work. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean euismod bibendum laoreet. Proin gravida dolor sit amet lacus ...

More


1939	Year	1935
Long Island, NY	Location	New York
Oil on Canvas Board	Medium	Oil on Canvas
10 x 14 in	Dimensions	20 1/4 x 28 in.

COLOR PALETTE



Arthur Dove

The Red Sun




This is a short description of this work. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean euismod bibendum laoreet. Proin gravida dolor sit amet lacus accumsan ...

More

1939	Year	1935
Long Island, NY	Location	New York
Oil on Canvas Board	Medium	Oil on Canvas
10 x 14 in	Dimensions	20 1/4 x 28 in.

SHARED PALETTE



THEME

Shadows

SHARED THEMES

Sunset Hills Landscape

Agriculture Clouds

Serendipity and Insights *(federated collection browsing)*


American Art Collaborative Documentation Application

AAC Collections

INSTITUTIONS EXPLORE ARTISTS EXPLORE BY CATEGORIES COLLECTION PROFILE

Smithsonian American Art Museum

I DREAMED I COULD FLY



Carlos Almaraz

OBJECT # 99999999

PARTNER [https://www.siamuseum.org/americanart/museum/index.html](#)

TYPE Painting

MEDIUM Paint on paper

TECHNIQUE Gesso, temper, dollar, oil, enamel, connoisseur, adorning

IDENTIFIERS

DESCRIPTION Connoisseur, adorning, etc.

LOREUM IPSUM DOLOR SIT AMET, CONNOISSEUR, ADORNING, ETC. AMENAM EXPANDED BIBLIANDUM LOREET. PROIN GRAVIDA DOLOR SIT AMET ACCUM...

CURRENT LOCATION Baltimore, MD

DATE 1986

EXTENSIONS 24" x 20"

SUBJECT Music, dreams, fire, color, rhuba keyboard

CIT-TIME Lorem ipsum dolor

RELATED WORKS

- Works by this artist in this institution
- Works by this artist in other institutions
- Works on a similar subject in this institution
- Works on a similar subject in other institutions
- Works by related artists in this institution
- Works by related artists in other institutions

PALETTE

PANTONE #305

HISTORICAL CONTEXT

JAZZ AGE GREAT DEPRESSION WORLD WAR II GREAT SOCIETY POST-COLD WAR

Women's right to vote 1920 Civil Rights Act 1964

RELATED WORKS BY THIS ARTIST

15 Works by related artists in this institution

EXHIBITION HISTORY

DATES	LOCATION	EXHIBITION DESCRIPTION
August 29-24, 2016	Neelson Aldrich Museum Kansas City, MO	Neelson Aldrich Museum Lorem ipsum dolor sit amet, connoisseur, adorning, etc. Nulla sed neque eu leo tempus sodales in et metus. Sed neque metus, venenatis vel condimentum mollis, faucibus sed enim.
May 03 - June 03, 2016	Smithsonian American Art Museum 810 13th & 13th Street, Washington, DC 20001	Lorem ipsum dolor sit amet, connoisseur, adorning, etc. Nulla sed neque eu leo tempus sodales in et metus. Sed neque metus, venenatis vel condimentum mollis, faucibus sed enim.

ARCHIVES

DATE	CORRESPONDENT	DESCRIPTION
June 03, 1986	John Latham Milford, USA	Lorem ipsum dolor sit amet, connoisseur, adorning, etc. Nulla sed neque eu leo tempus sodales in et metus. Sed neque metus, venenatis vel condimentum mollis, faucibus sed enim.

American Art Collaborative Documentation Application

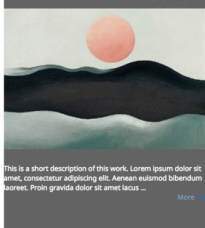
AAC Collections

INITIAL CONCEPTS (for discussion only)

INSTITUTIONS EXPLORE ARTISTS EXPLORE BY CATEGORIES COLLECTION PROFILE

Georgia O'Keeffe

Sunset



1939 Year 1935

Long Island, NY Location New York

Oil on Canvas Board Medium Oil on Canvas

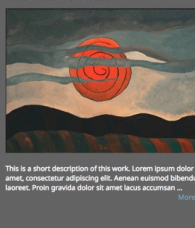
10 x 14 in Dimensions 20 1/4 x 28 in.

This is a short description of this work. Lorem ipsum dolor sit amet, connoisseur, adorning, etc. Amenam expanded bibliandum loreet. Proin gravida dolor sit amet accu...

More

Arthur Dove

The Red Sun



This is a short description of this work. Lorem ipsum dolor sit amet, connoisseur, adorning, etc. Amenam expanded bibliandum loreet. Proin gravida dolor sit amet accu...

More

COLOR PALETTE

SHARED PALETTE

THEME

Shadows SHARED THEMES Agriculture Clouds

Sunset Hills Landscape

DIMENSIONS

10 x 14 in 20 1/4 x 28 in.


TIMELINE

Arthur Dove

Georgia O'Keeffe

Early Middle Late

LOCATIONS



Location of Arthur Dove's 'The Red Sun'

Location of Georgia O'Keeffe's 'Sunset'

American Art Collaborative
initial design concepts

When the work was created.

Creation Location

Where the work was created.

Acquisition Date

When the work was acquired.

Aboutness

Main Description

Description of the work.

Other Descriptions

Alt. description of the work.

Classification

The type of object the work is.

Style

The style or period of the work.

Subject

What the work depicts.

Technique

How the object was made.

Concept

What the work is about.

Materials

What the work is made of.

Medium Text

A medium descriptive text.

Physical Object

Current Owner

Who owns the work.

Current Location

Where the work is located.

Responsible Department

Institution Department responsible for the work.

Dimensions (Part)

Size of a part of the work.

Dimensions

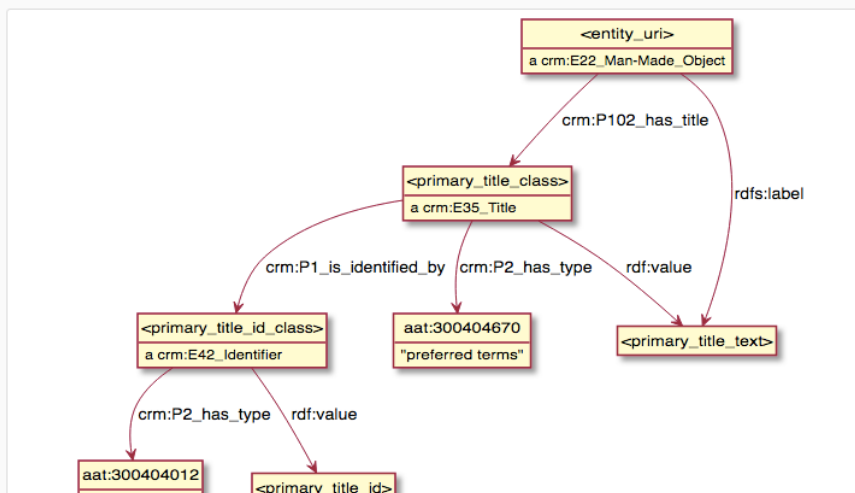
Primary Title for data.americanartcollaborative.org/npg/object/49748

primary_title_text	primary_title_class	primary_title_id	primary_title_id_class
William McChesney Martin	http://data.americanartcollaborative.org/npg/th...		

[Show this Query](#) [Show this as Turtle](#)

Do you see a problem with this? [Submit an issue.](#)

AAC Target Mapping For Primary Title




The screenshot displays the DIVE+ search interface. At the top, the logo 'DIVE+' is on the left, and 'CLARIAH MEDIASUITE' is on the right. Below the logo is a search bar containing the text 'zomer' and a star icon. To the left of the main content is a sidebar with an 'EXPLORATION PATH' section. It contains a search bar with 'vredepaleis' (3 results) and 'zomer' (1 result). Below these are two items with a '12' icon: 'Natte zomer op Mars 3. 4. 9. 10. M. 13. ...' and 'Reces Kamer. Donderdag 13 Juli 1950. ...'. The main content area features a 'Related searches:' section with buttons for 'vredepaleis', 'Wim Kok', 'Ruud Lubbers', 'Rotterdam', 'Vredespaleis', and 'schaatsen'. Below this is a 'Search results' section showing '59' results and '15' related items. A 'Filter by keyword' section is present with a date range from '1937-04-04' to '2014-06-06'. The results are displayed in a grid of document thumbnails. Three thumbnails are visible with the following titles: 'halk. 1. 7. 54 alleen 0800 zomer-compet. KNZB 1. Zwemm...', 'zomertje 10. n. 12 13. !4. 13. Het slechte zomer-weer ...', and 'de barre zomer van '54 halk 8. 7. 54 1300 In vele delen van Oosten...'. Each thumbnail includes a '12' icon and a small document preview.

Browsing and Reviewing Graph Data

g2t Home Browse History Logout

Man in Oriental Costume



Design for Context

BIBLIOGRAPHY

PRODUCTION

- has known creator
 - Rembrandt van Rijn
 - Rembrandt Workshop
- has possible creator
 - Goveart Flinck
- carried out for
 - Kiliaen van Rensselaer
- was produced in location
 - Leiden, Netherlands
- has production time-span
 - c. 1635
- consists of material
 - oil on canvas
- has modification/repair
 - Major Treatment, 1995

CONSTITUENT

EVENT

- has exhibition event

BIBLIOGRAPHY

PRODUCTION

- commissioned by
 - Kiliaen van Rensselaer
- same creation time-span as
 - Saskia van Uylenburgh, the wife of the Artist
- same production location as
 - Saskia van Uylenburgh, the wife of the Artist
 - The Crucifixion

CONSTITUENT

EVENT

DOCUMENT/MANUSCRIPT

Diagram illustrating the browsing and reviewing of graph data for a painting titled "Man in Oriental Costume". The image shows a central panel with a list of properties (BIBLIOGRAPHY, PRODUCTION, etc.) and their values. A green box highlights the "PRODUCTION" section, which includes details like "has known creator" (Rembrandt van Rijn, Rembrandt Workshop), "has possible creator" (Goveart Flinck), "carried out for" (Kiliaen van Rensselaer), "was produced in location" (Leiden, Netherlands), "has production time-span" (c. 1635), "consists of material" (oil on canvas), and "has modification/repair" (Major Treatment, 1995). Another green box highlights the "PRODUCTION" section of a related item, showing "commissioned by" (Kiliaen van Rensselaer), "same creation time-span as" (Saskia van Uylenburgh, the wife of the Artist), and "same production location as" (Saskia van Uylenburgh, the wife of the Artist, The Crucifixion). Green lines connect the "Man in Oriental Costume" panel to the highlighted sections, indicating relationships between the two items.

Historic Places LA (Arches Platform)

The screenshot displays the Historic Places LA 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 Los Angeles Conservancy logo and a tagline: "Preserving the historic places that make L.A. County unique. Learn More >". A secondary navigation bar contains icons and labels for "Explore L.A.", "Events & Tours", "Important Issues", "What We Do", "Get Involved", and "Resources".

The main content area features a map of Los Angeles with numerous black location pins. A popup window titled "Cox House" is open, showing a photograph of the house and a description: "A remarkable Mid-Century Modern residence that literally embraces the natural environment, so much so it's aptly nicknamed 'The Tree House.'" The popup also includes the name "John Galbraith >" and a photo credit: "Photo courtesy Architectural Resources Group".

Below the map is a search interface with the following fields and options:

- Keyword:** house
- Location:** 100 Miles from []
- Architectural Style:** Choose some options
- Architect:** Choose some options
- Community:** Choose some options
- Decade:** Choose some options
- Property Type:** Choose some options

At the bottom of the search interface are "Search" and "Clear" buttons. The footer contains the URL <http://www.historicplacesla.org/map> and the URL <https://www.laconservancy.org/explore-la/historic-places>.

<http://historicplacesla.org/map>

<http://www.historicplacesla.org/map>

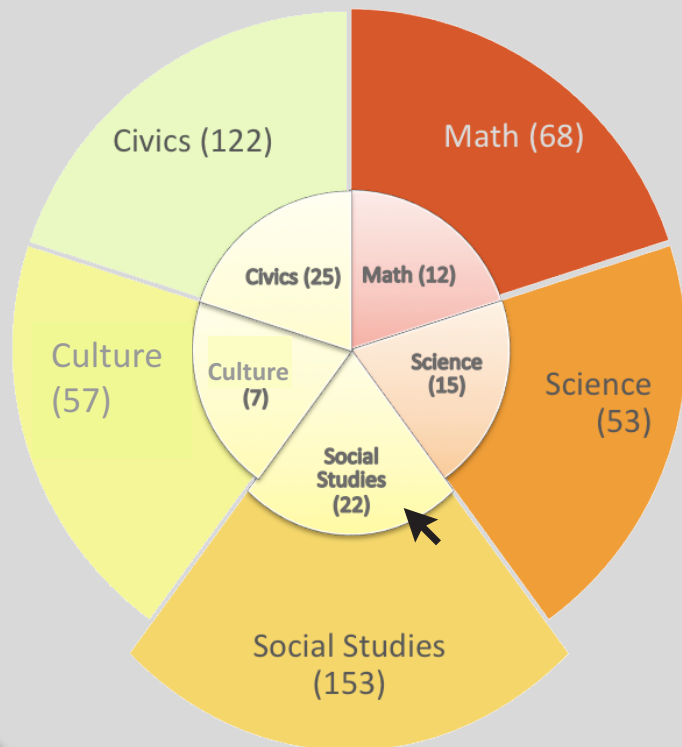
<https://www.laconservancy.org/explore-la/historic-places>

Find Synthesis *(education concept)*

Results for Benjamin Franklin 534 results total

Subject: All ▼

Grade Level: 6-12 ▼



Available online



Available in school district

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](#)

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)

Spark Imagination (text mining/analysis concept)



VINCENT VAN GOGH
1853-1890

BIRTHPLACE:
ZUNDEERT, NL

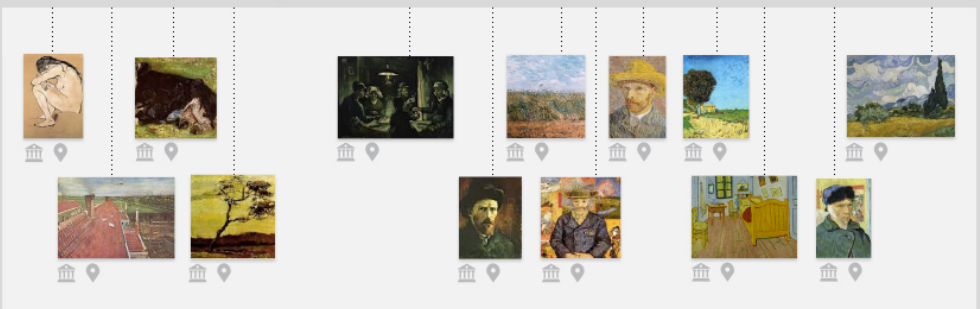
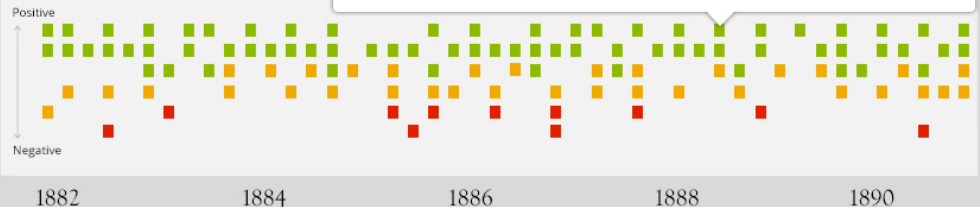
PLACES WORKED:
NUENE, ANTWERP,
PARIS, ARLES, [more...](#)

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

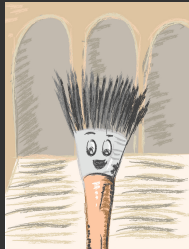
[View full letter](#) [View full set](#)



Conversational avatars: Enhance experience across the entire journey



Engaging
conversation:
Text and
voice



Smooth
online-to-
gallery
transitions

Explore a collection
with your personal
digital docent



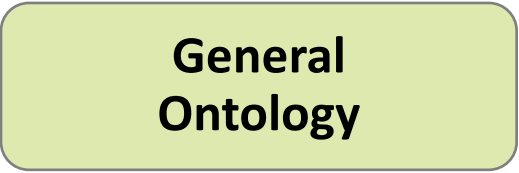
Multi-
institution

WHAT IS LINKED DATA ?

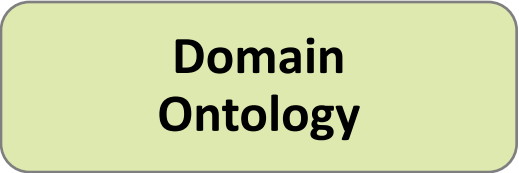
- ◆ Triples
- ◆ Ontologies
- ◆ Vocabularies
- ◆ Entities

The theory, part 2

Common relationship structures, e.g. genealogy, commerce



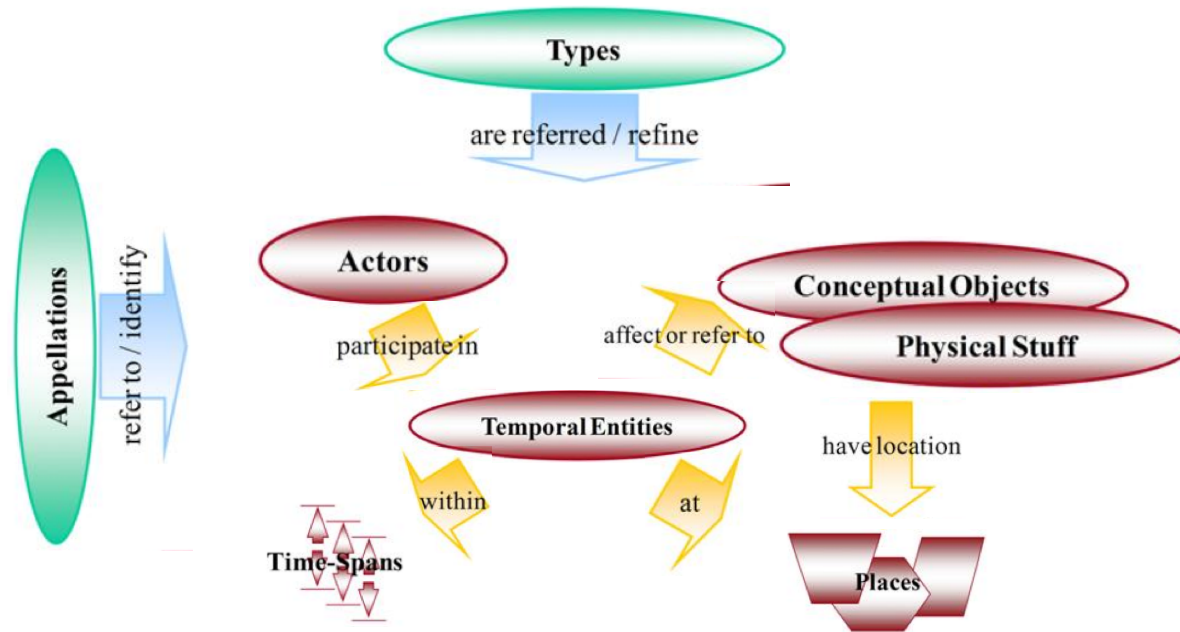
Domain-specific, e.g. medicine, government



Specialized model, e.g. workflow structures, policies

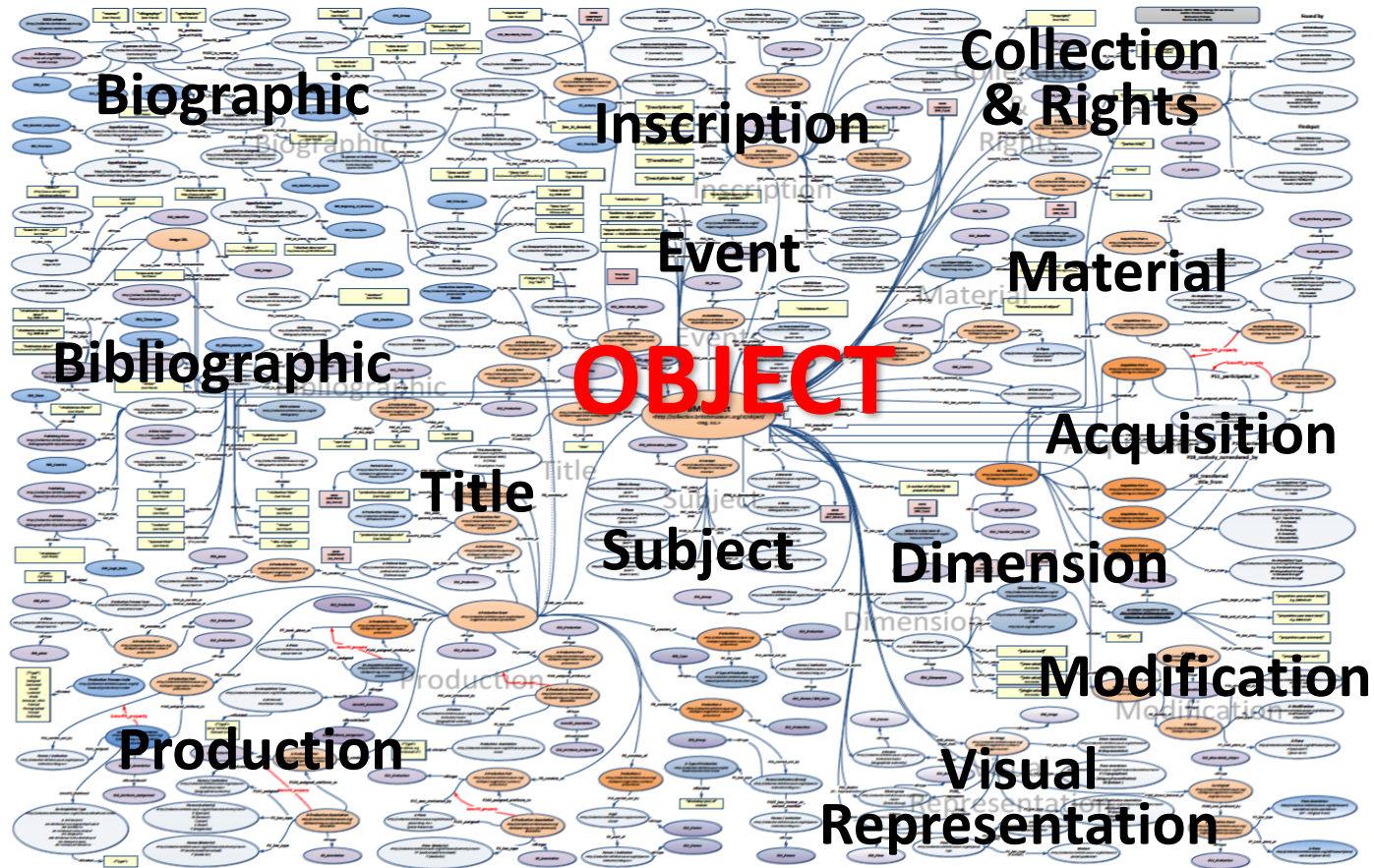


Ontologies: CIDOC-CRM (Conceptual Reference Model)



- Product of more than 20 years of development and testing
- Event-based (documenting persistent and temporary things)
- Extensible

Domain-Specific: British Museum, using CIDOC-CRM

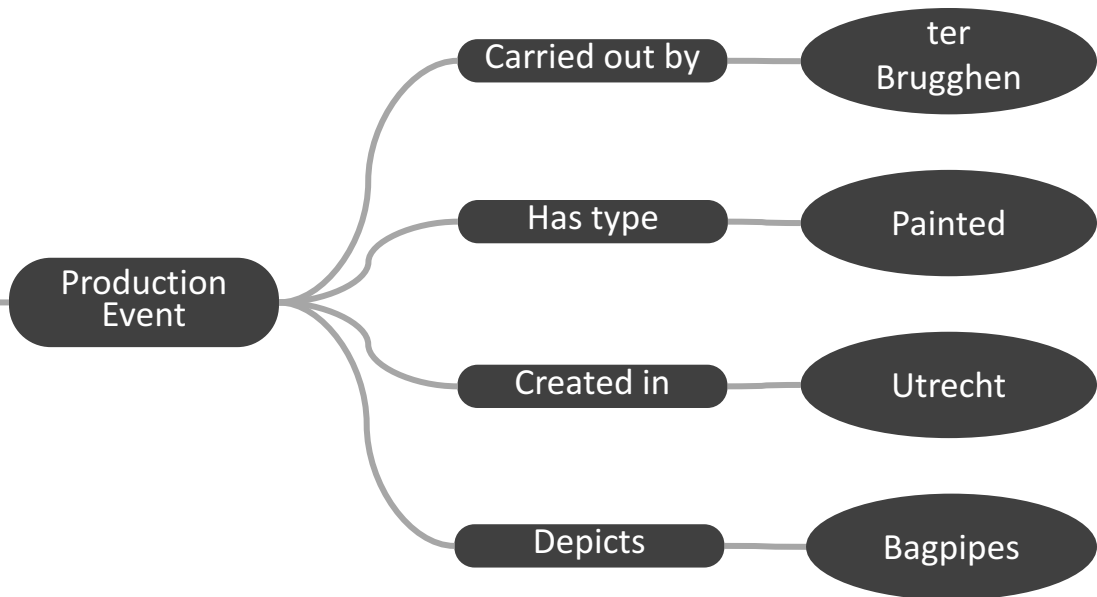


<https://confluence.ontotext.com/display/ResearchSpace/BM+Mapping>

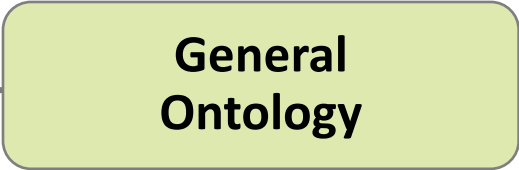
Naming and Typing things in the CRM



The Bagpipe Player
(c.1624)
Hendrick ter Brugghen



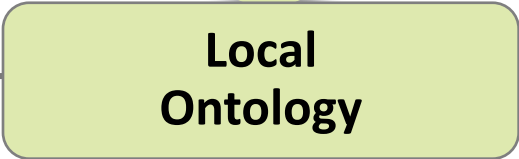
Common relationship structures, e.g. genealogy, commerce



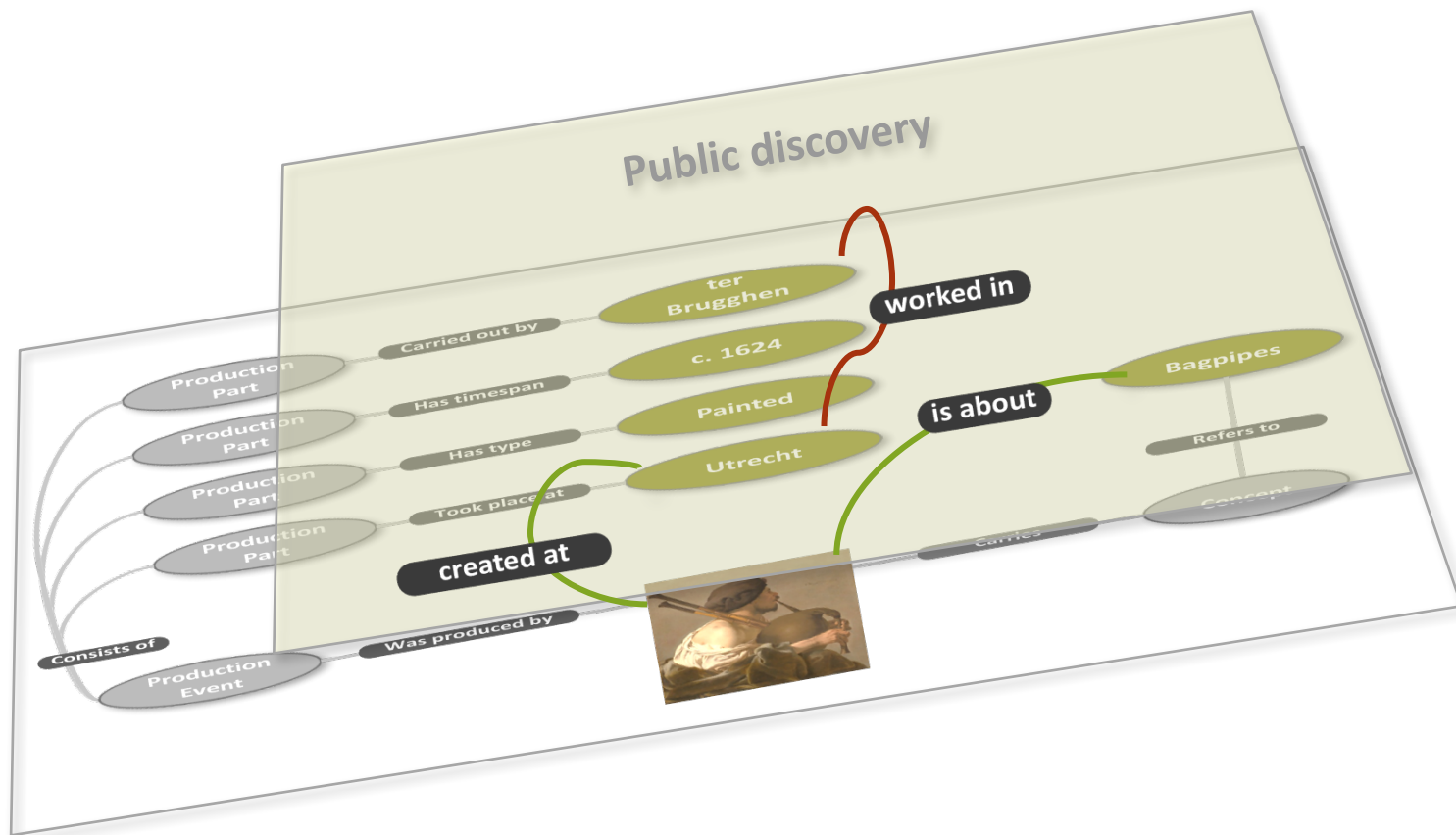
Domain-specific, e.g. medicine, government



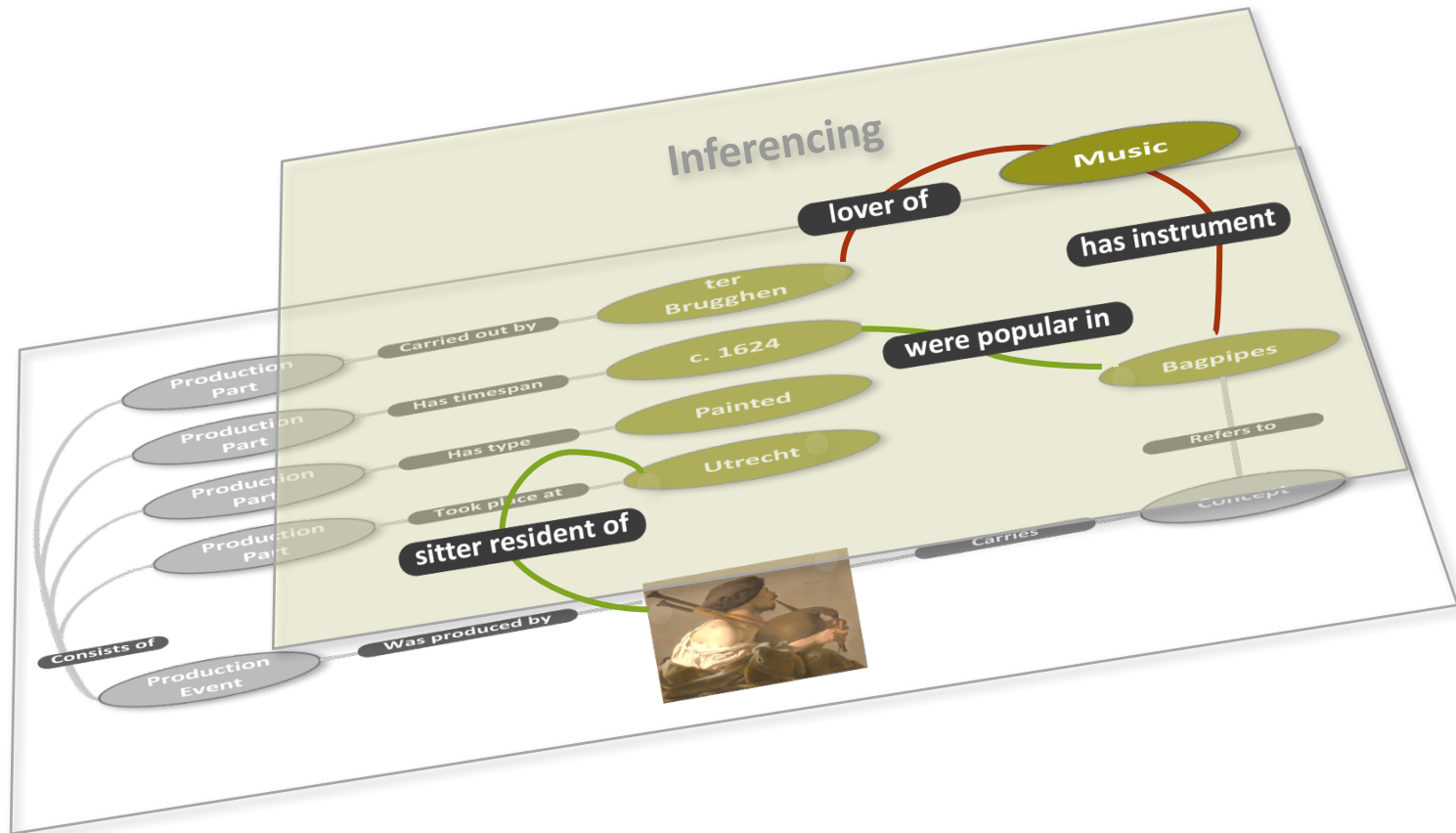
Specialized model, e.g. workflow structures, policies

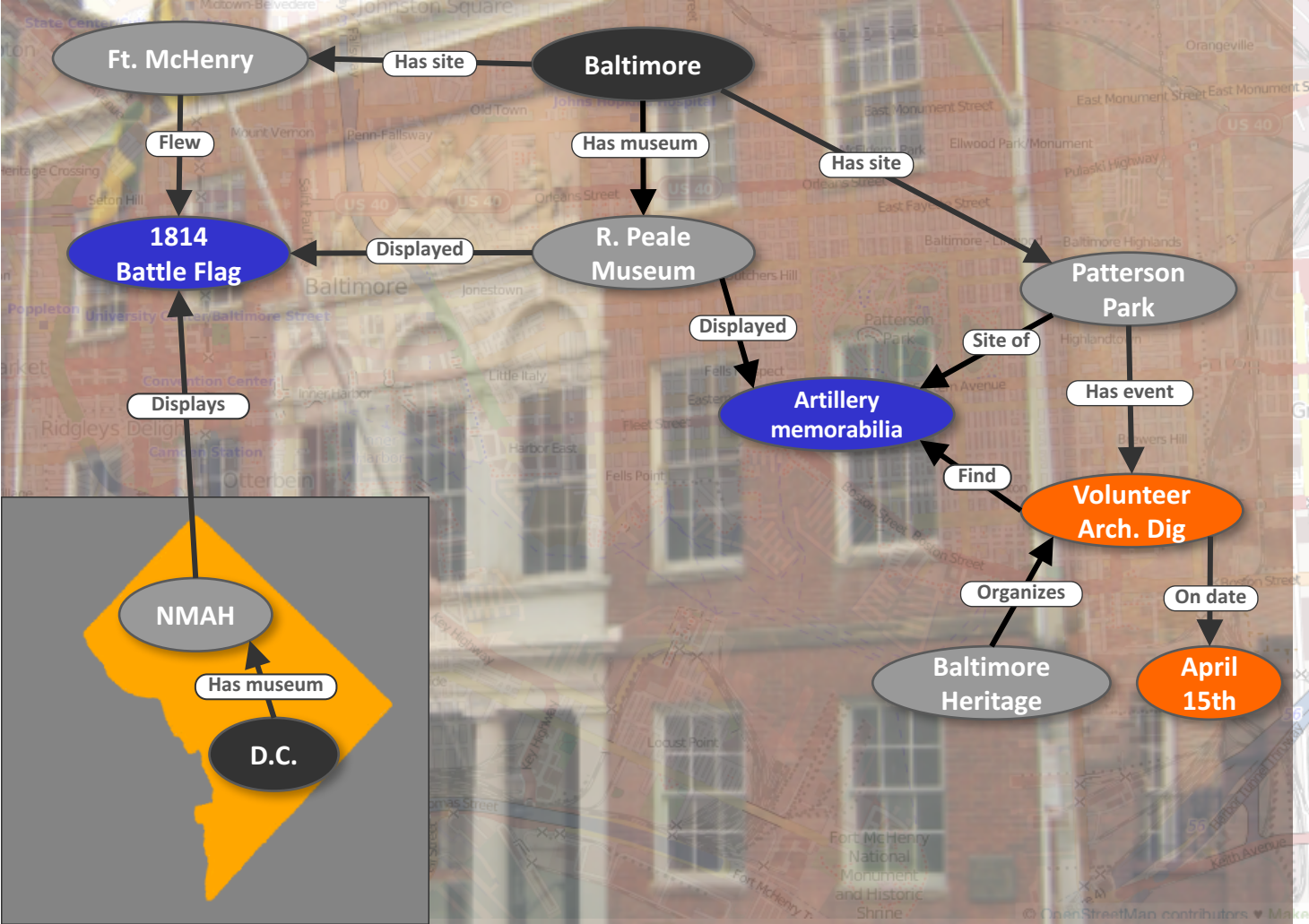


Shortcuts and non-destructive contexts



Inferencing: *Eliciting facts without linking explicitly*

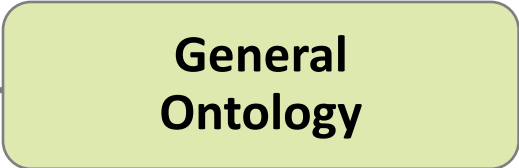




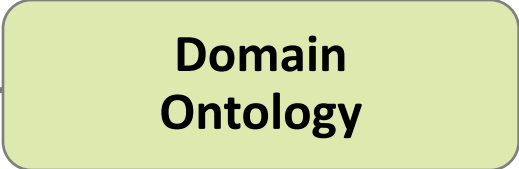
COMMON LANGUAGE

- ◆ Vocabularies
- ◆ Reconciliation

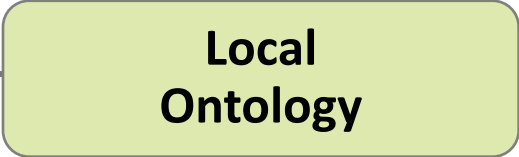
Common relationship structures, e.g. genealogy, commerce



Domain-specific, e.g. medicine, government



Specialized model, e.g. workflow structures, policies



Shared language to express common concepts, e.g. geography, art



Specialized language, e.g. department names, product details

Texas Coastal Bend Collection

<http://www.texascoastalbend.org>



The Story Behind the Collections

"This whole project is based on sounds — they're echoes from the past callin' to us to be remembered. We're movin' too fast to hear them now; we'll have to go into the past to recover them, to recover a way of life that is gone, a better way of life. There was a lot wrong back then, but there was a lot more right. The good keeps on comin' back, tryin' to be heard. These people are the instruments of those righteous echoes." - Nathaniel Youngblood, Tophand

Vocabulary Relationships *(subject alignment for collaboration)*

Orientation / nav

Topics

Classification of an Object

About-ness

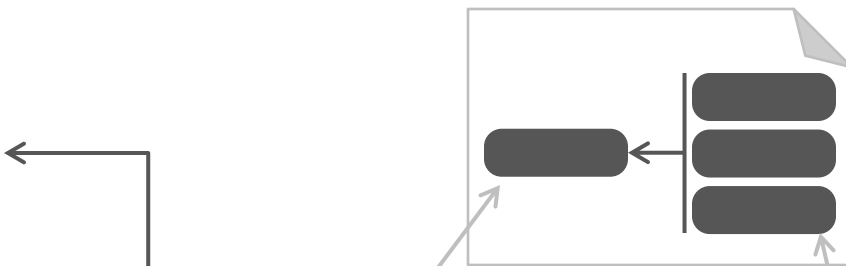
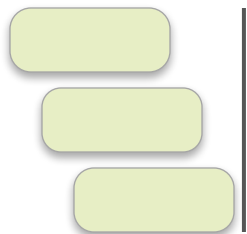
Depicts *(primary)*

Depicts *(background)*

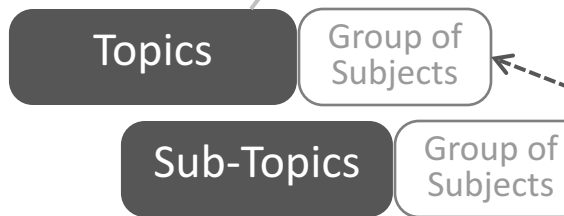


Vocabulary Relationships *(subject alignment for collaboration)*

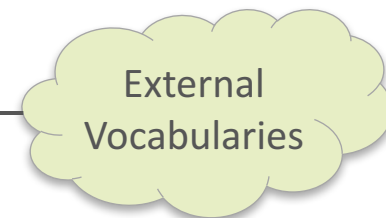
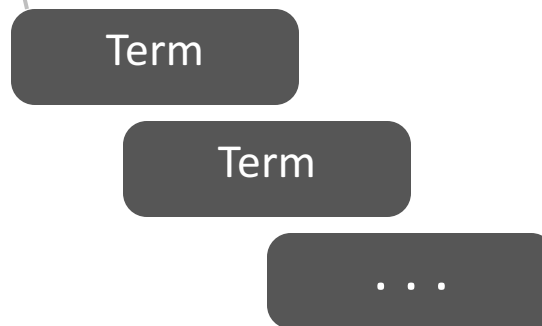
External Collaborators



Themes



Subjects

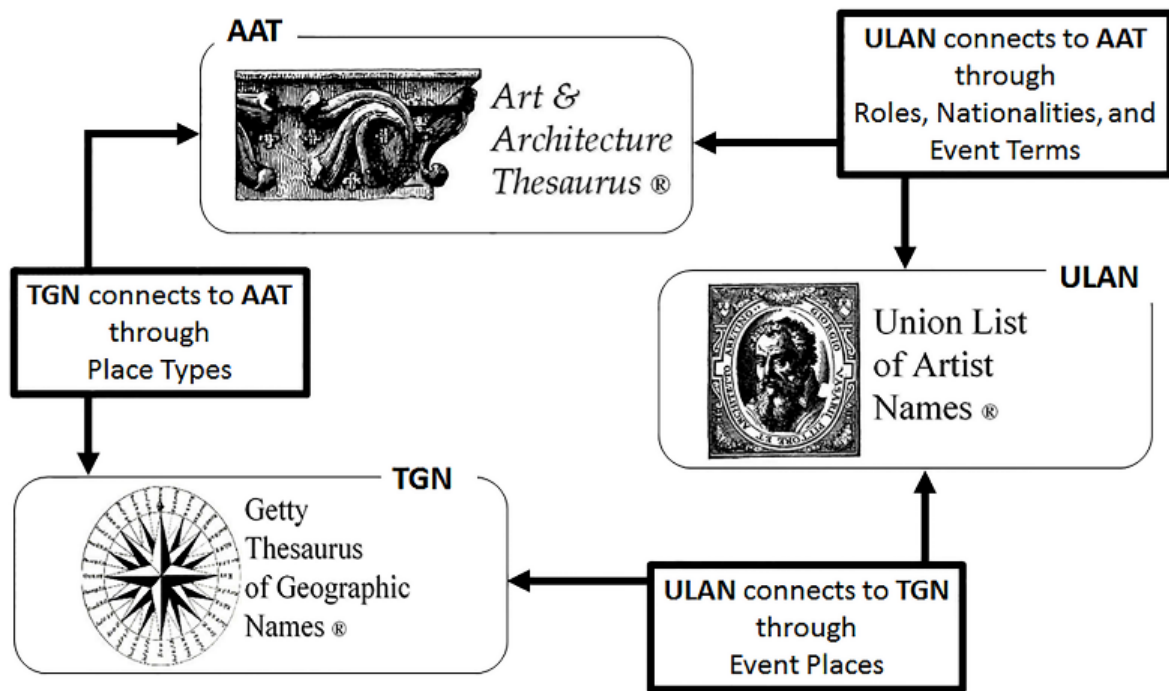


Texas Coastal
Bend Collection
metadata subject architecture

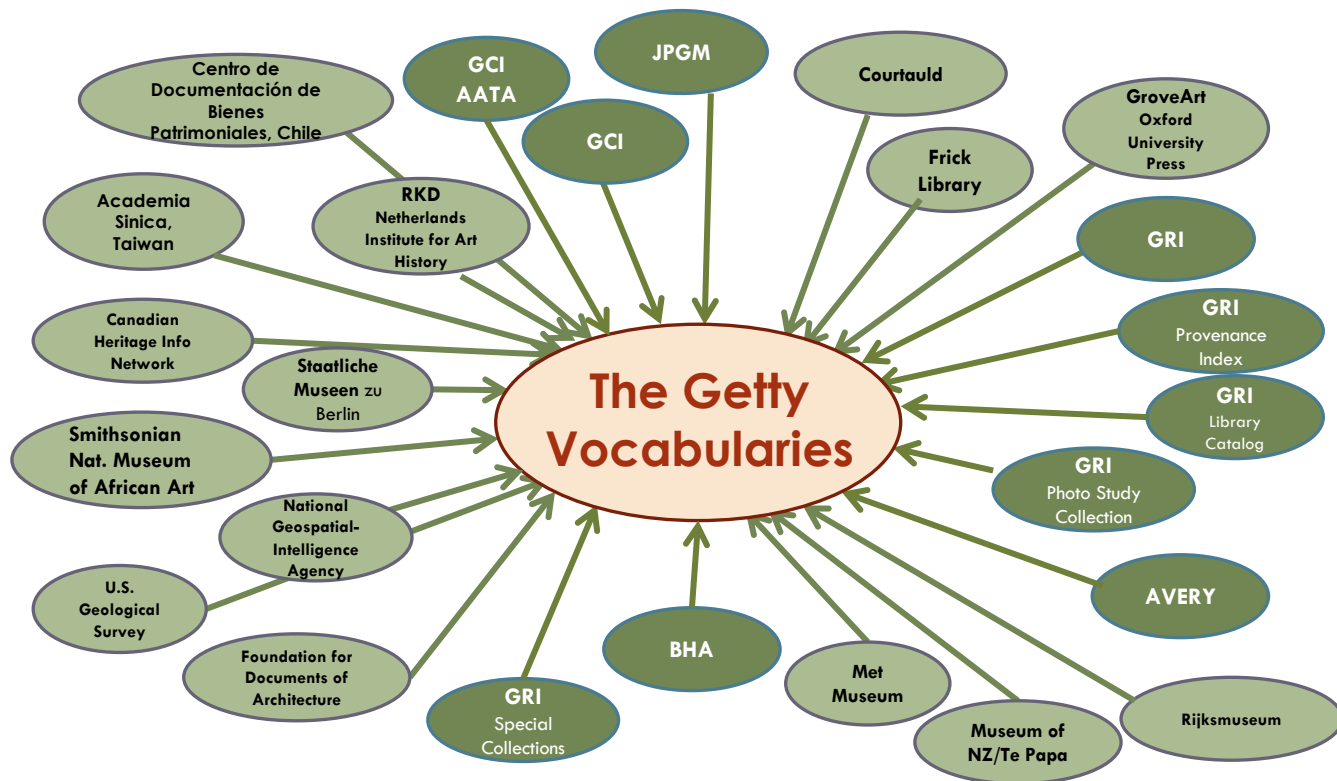
Vocabularies and Instance Data

- Examples of 3rd party linked data authorities
 - Getty Vocabularies
 - Library of Congress Subject Headings and Name Authorities
 - GeoNames
 - Virtual International Authority File (VIAF)
 - Dbpedia / Wikidata
- Local authorities
 - Institutional vocabularies (e.g., department names)
 - Your variation on an existing authority

The Getty Vocabularies are Semantically Linked



Where do the terms and concepts come from?

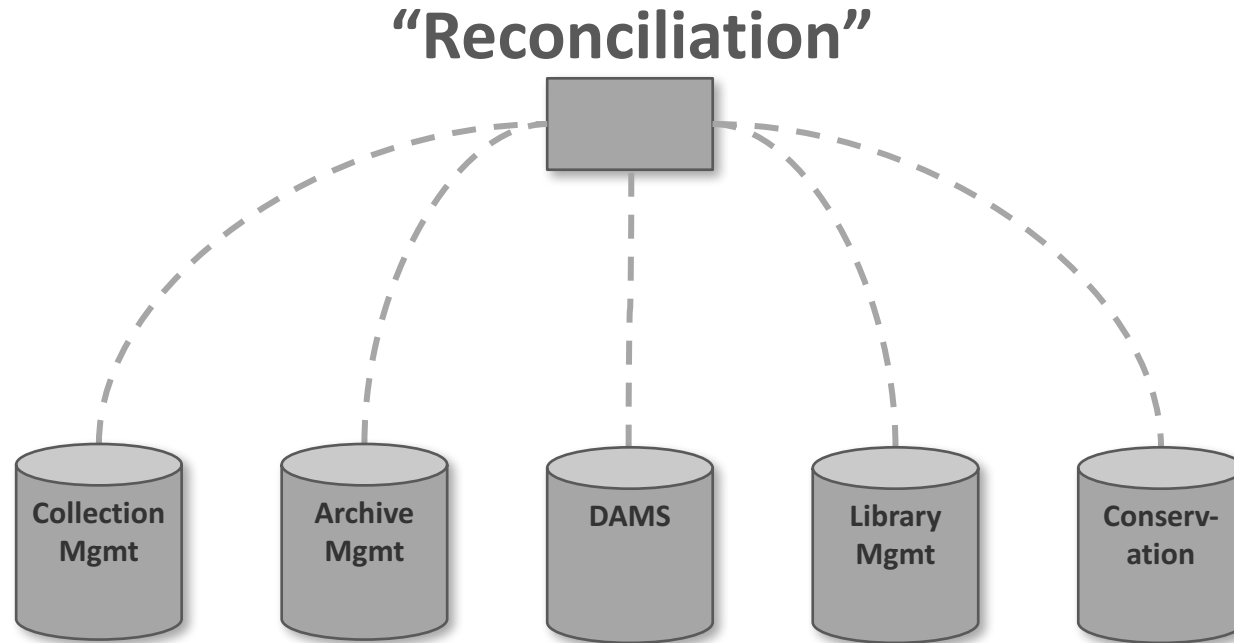


Example of some of the top contributors

Getty Vocabulary resources

- Developer SPARQL Endpoint
 - <http://vocab.getty.edu>
- General Information about our LOD project
 - <http://www.getty.edu/research/tools/vocabularies/lod/index.html>
- About the Getty Vocabularies in general
 - <http://www.getty.edu/research/tools/vocabularies/index.html>
- Public Forum
 - <https://groups.google.com/forum/#!forum/gettyvocablod>
- Examples of ID 300198841
 - Human readable: <http://vocab.getty.edu/page/aat/300198841>
 - Machine readable: <http://vocab.getty.edu/aat/300198841>

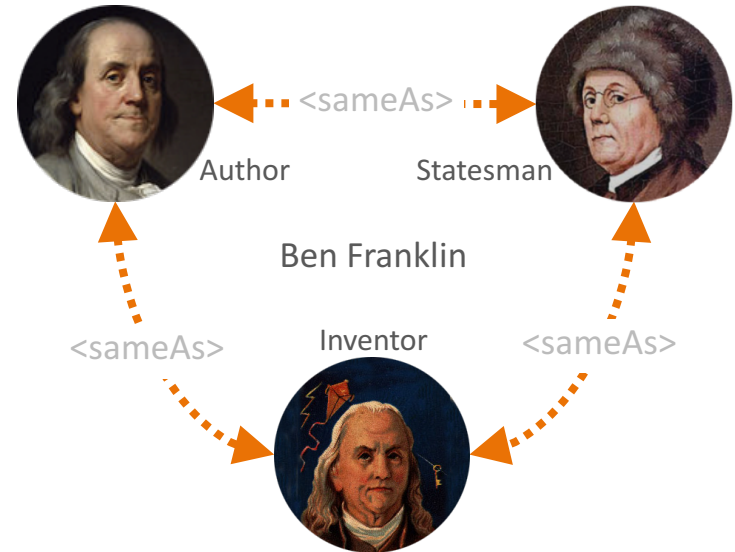
How do we know we're talking about the same thing?



Reconciliation

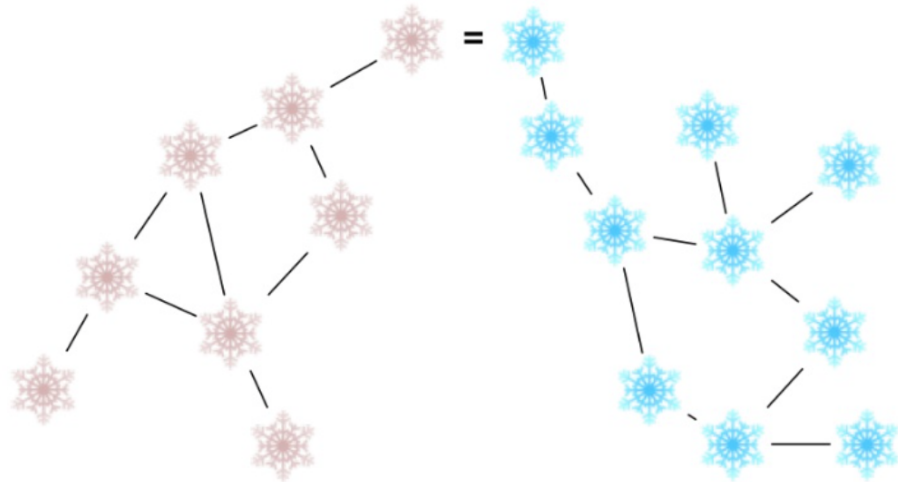
When each department
or institution is talking about...

- A person
- An institution
- An artwork
- A location
- A subject
- A time period

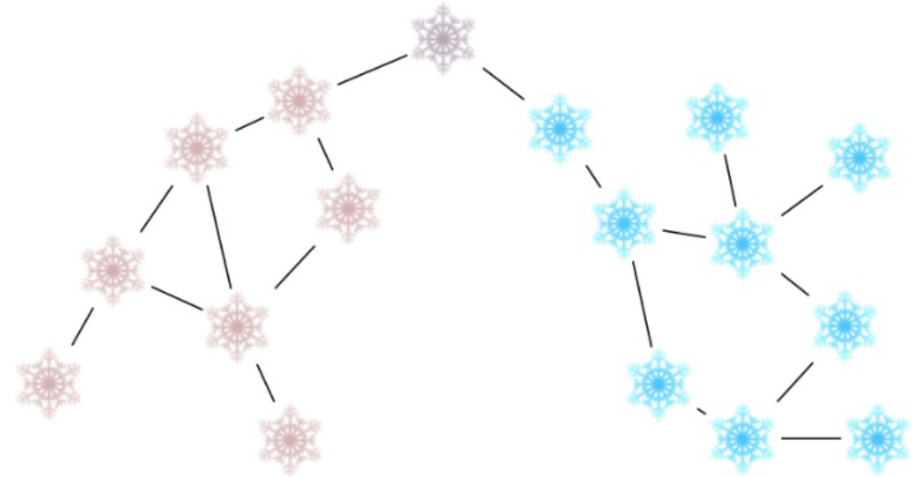


Reconciliation

Option 2a: Reconciliation (distributed authority)



Option 2b: Reconciliation (centralized authority)



Many Special and Unique Snowflakes

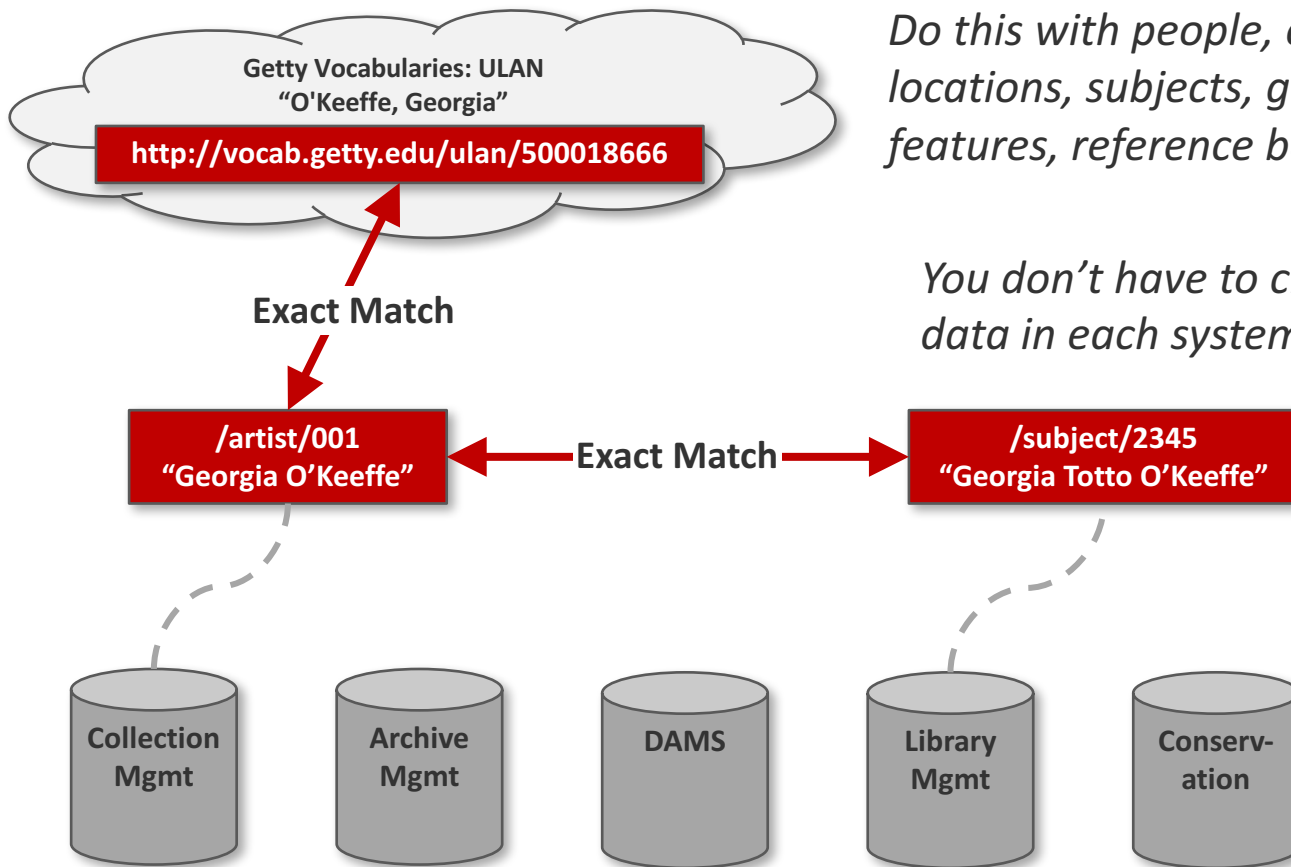


Become a Huge Snowball of Technical Debt



Linked Data Snowball, or Why We Need Reconciliation (4.2016)
Rob Sanderson, Senior Semantic Architect, J. Paul Getty Trust, for AAC Reconciliation Meeting
<http://www.slideshare.net/azaro42/linked-data-snowball-or-why-we-need-reconciliation>

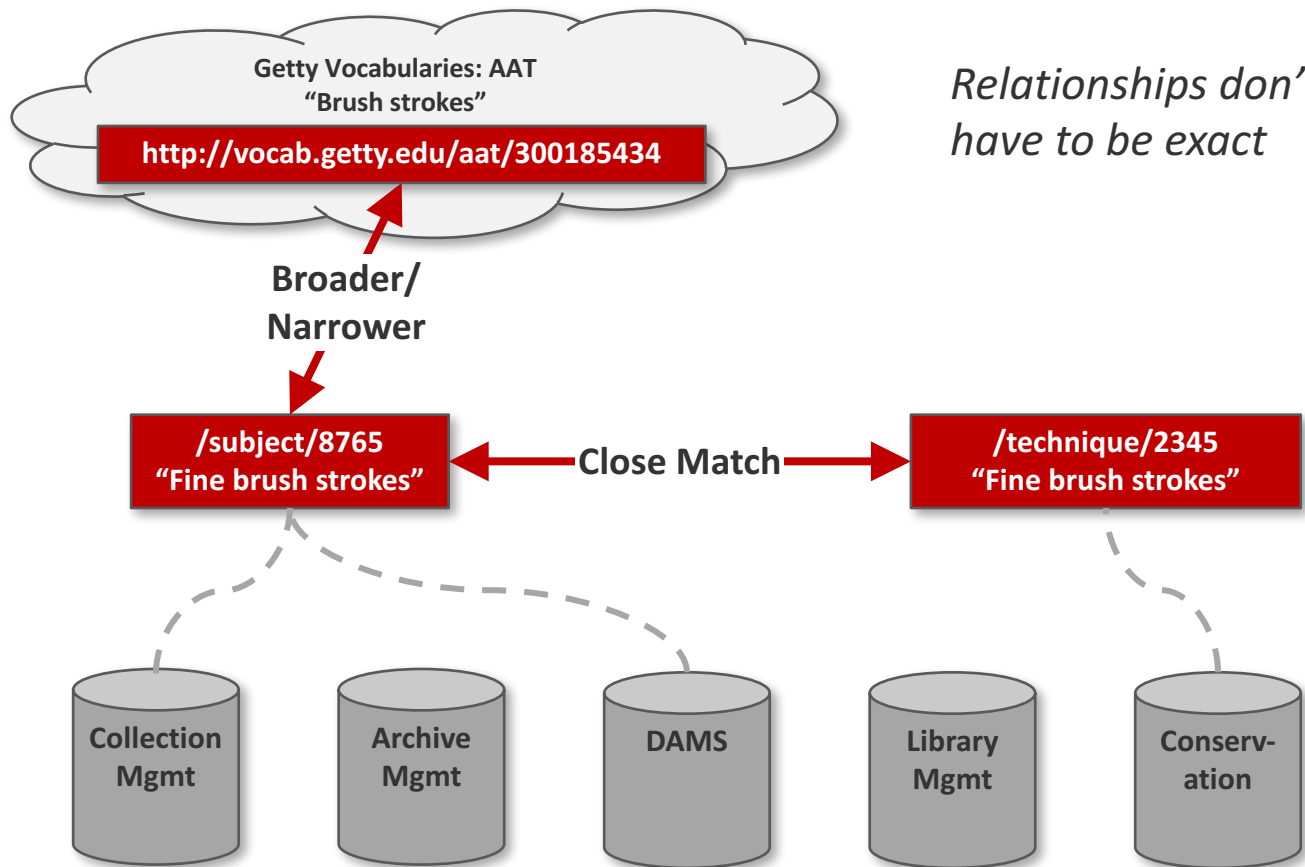
Gluing different data sets together



Do this with people, organizations, locations, subjects, geographic features, reference books, etc.

You don't have to change the data in each system to match...

Gluing different data sets together



Relationships don't have to be exact

Multi-Institution Collaboration ?

- Desired by your institutions
- Desired by your funders
 - For example... 2016 IMLS / NEH initiative

“...Under this new partnership, we are encouraging applications that involve innovative collaborations between museum or library professionals and humanities professionals...”

NEH news announcement: Digital Humanities Advancement Grants, 7.21.2016 <http://bit.ly/nehgrants>

“...an interrelated set of activities forming a decentralized ecosystem can unite memory institutions in pursuing a shared strategy.”

Page 5, IMLS Focus Summary Report: National Digital Platform, 4.28.2015 <http://bit.ly/imlsplatform>

Some Motivations for Multi-Institution Collaborations

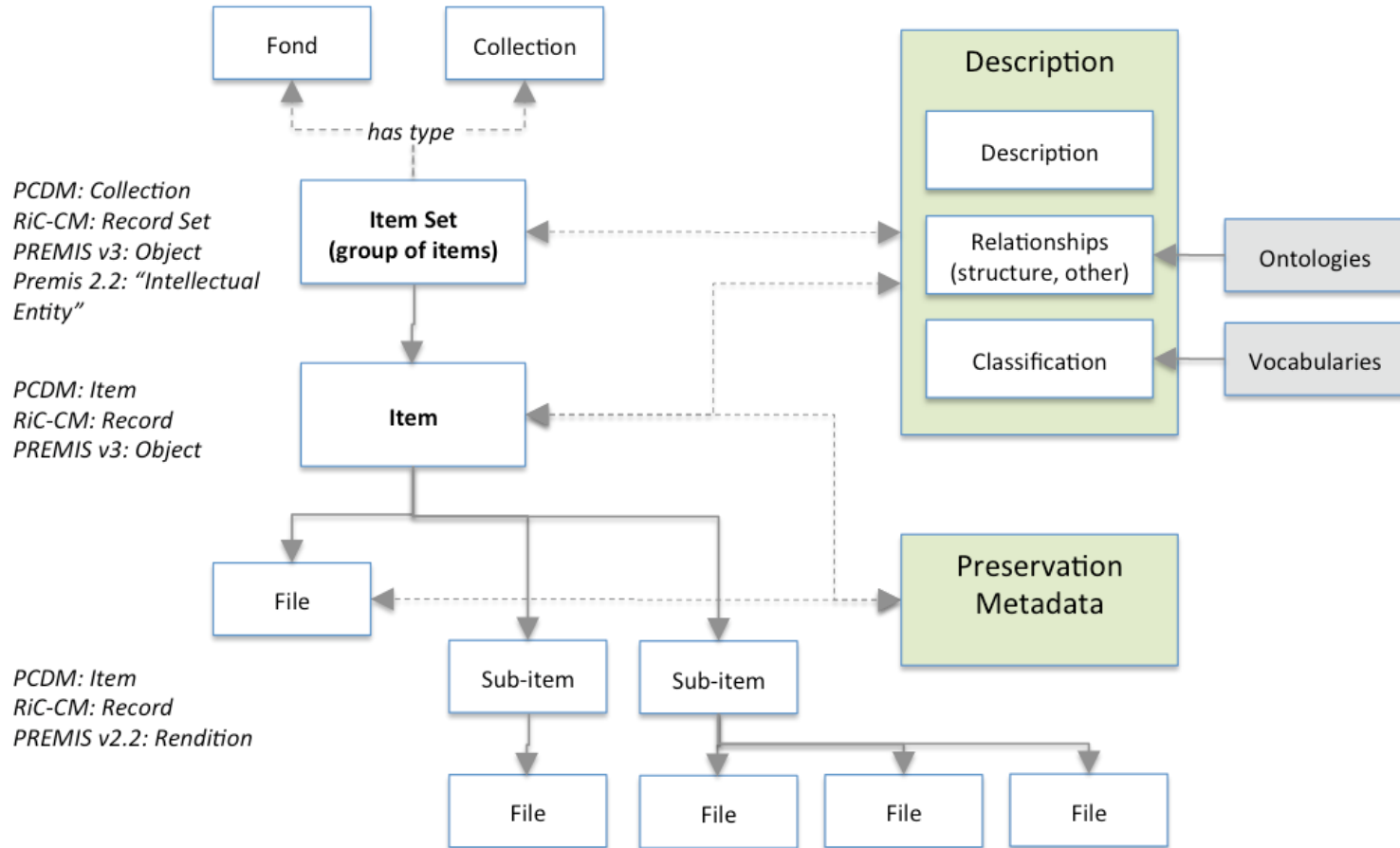
- Broaden exploration
 - Supporting scholars, serendipity, synthesis
- Topical collaborations
 - Education, exhibitions, engagement
- Enable sharing and reuse
 - Foster flexibility, creativity, open access
- ⊘ one-offs

MODELS

- ◆ Museums . . . and Libraries and Archives
- ◆ Technology (pipelines, architectures)

“Writing about music is like dancing about architecture” (attrib. possibly Martin Mull)

Archive model evolution



LAM: Libraries, Archives, Museums

- Museums
 - CDWA > CIDOC-CRM
- Libraries
 - MARC > FRBR/BIBFRAME
- Archives
 - EAD/EAC (MARC) > PREMIS/METS > RIC-RM, PCDM, PREMIS 3.0
- And...
 - DCMI (DublinCore), Schema.org, etc.

Playing Well Together

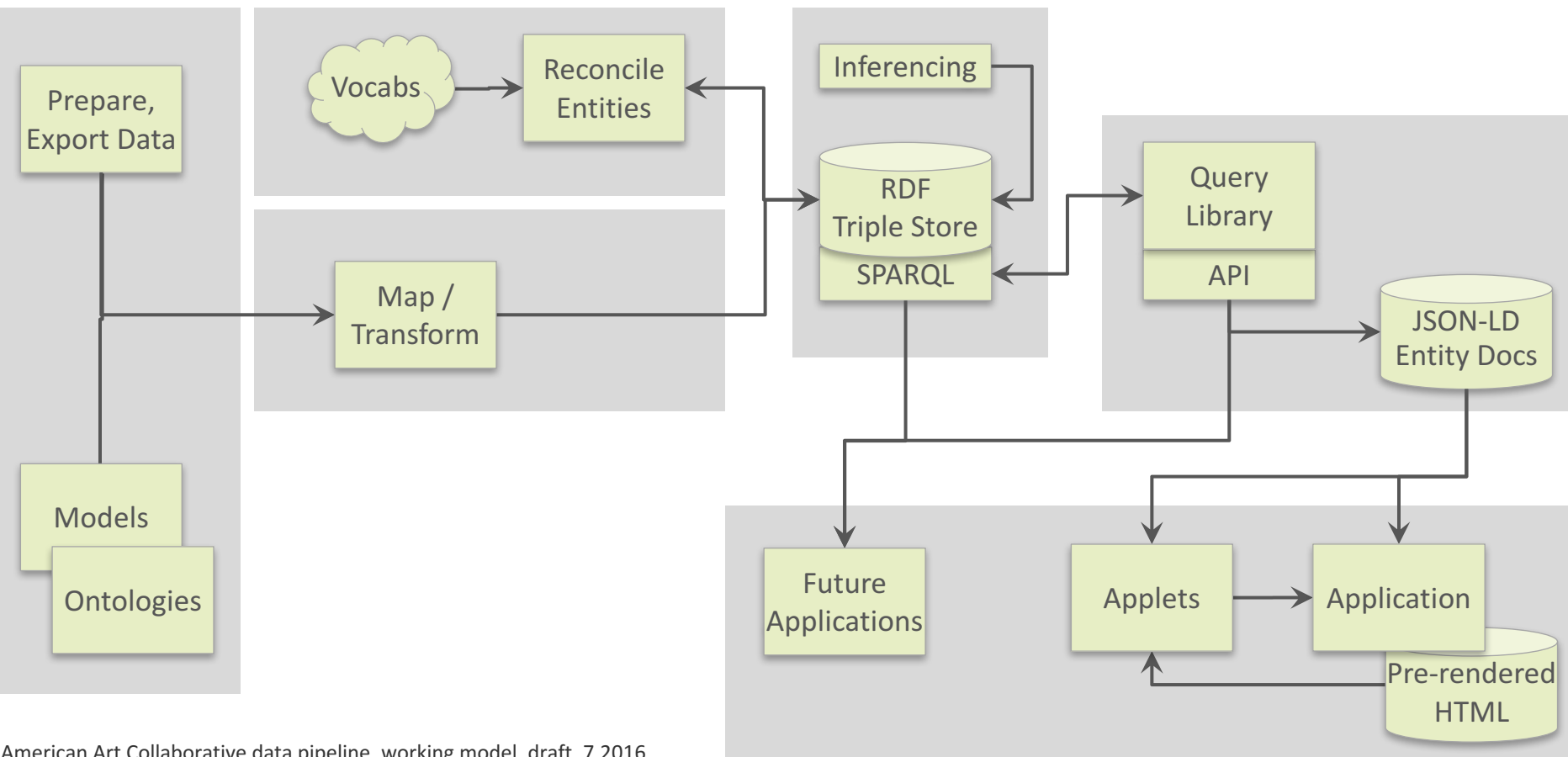
- Collaborate on content/data inventory
- Collect sufficient examples to understand the range

Term								
ThesXrefType								x
#Dimensions Node								
Dimension	x		x					x x
DimensionsDisplayText		x	x	x	x			x
DimensionType	x		x					x x
DimRank			x					x
Element	x		x					x x
UnitLabel	x		x					x x
#Constituents Node								
AlphaSort		x		x	x			
Biography								
BirthDate/BeginDate			x		x			x
BirthDeathDisplayDate		x	x	x	x			
BirthPlace/Nationality		x	x	x				x
Con Source Authority (ULAN, LOC, etc.)				x				x
CreatorDispOrder						x		x

American Art Collaborative, summer 2016

Display	Vocab Needed	Entity-descriptors	Sample data
Y	Y	CurrentLocation	Not on view
		DataDateStamp	2015-12-11T11:31:47.600
?		DateBegin	1901
Y	Y	Dated	early 20th century
?		DateEnd	1925
Y	Y	DateBegin/EndQualifier	circa, about, probably, before
?	Y	Department	American Art
Y		Edition	
Y		Inscription	[Signature] At lower left: James M. Hart; [Date] At lower left: 1859
Y		Object Accession Date	9/11/13
		Object AltNumber	TR11652
		Object Owned By or In Jurisdiction Of	
?		ObjectID	81155
Y		ObjectNumber	2013.72
Y	Y	Period/Dynasty/Era	late Archaic
Y		Provenance	William T. Walters, Baltimore, 1856, by commission; Henry Walters, Baltimore, 1894, by inheritance; Walters Art Museum, 1931, by bequest.
Y		PublicDescription	Waist-length, three-quarter to righ

Harmonizing and Modernizing Data



American Art Collaborative data pipeline, working model, draft, 7.2016

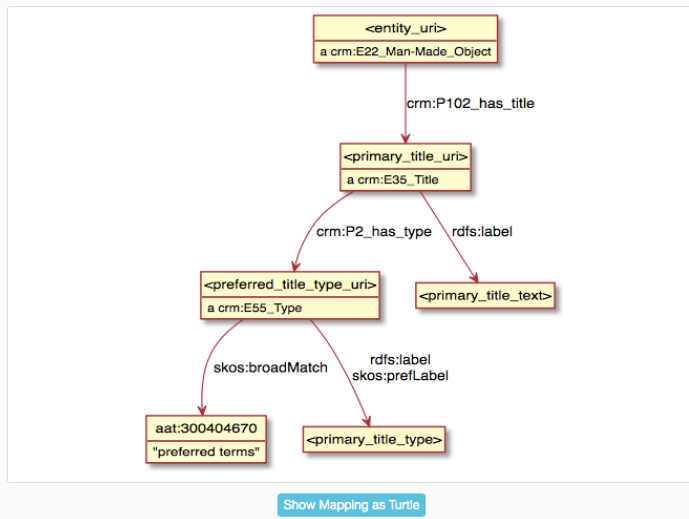
Harmonizing and Modernizing the Data

Primary Title

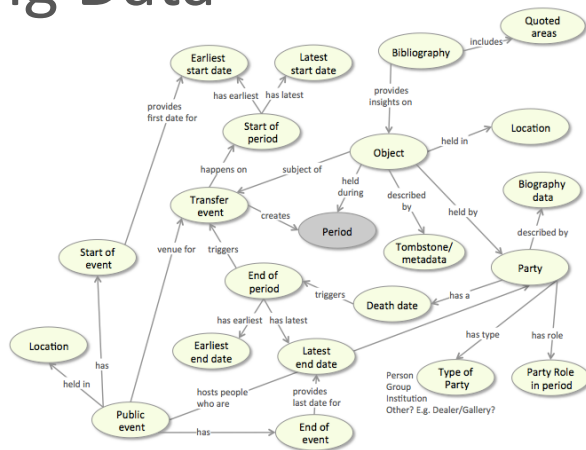
primary_title_text	primary_title_type	primary_title_uri
Blue Passion Flower, for the "Temple of Flora" by Robert Thornton	preferred	ycba:id/object/1000/title/1
The Blue Passion Flower, for Robert John Thornton's Temple of Flora (London, 1799-1812)	preferred	ycba:id/object/1000/title/1

[Show this Query](#) [Show this as Turtle](#)
 Do you see a problem with this? Submit an issue.

AAC Target Mapping For Primary Title



American Art Collaborative data review tool

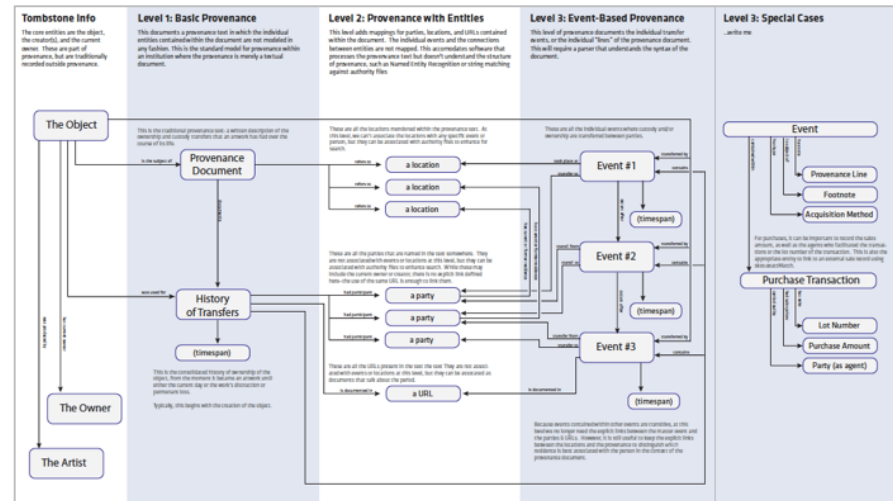


Early concepts

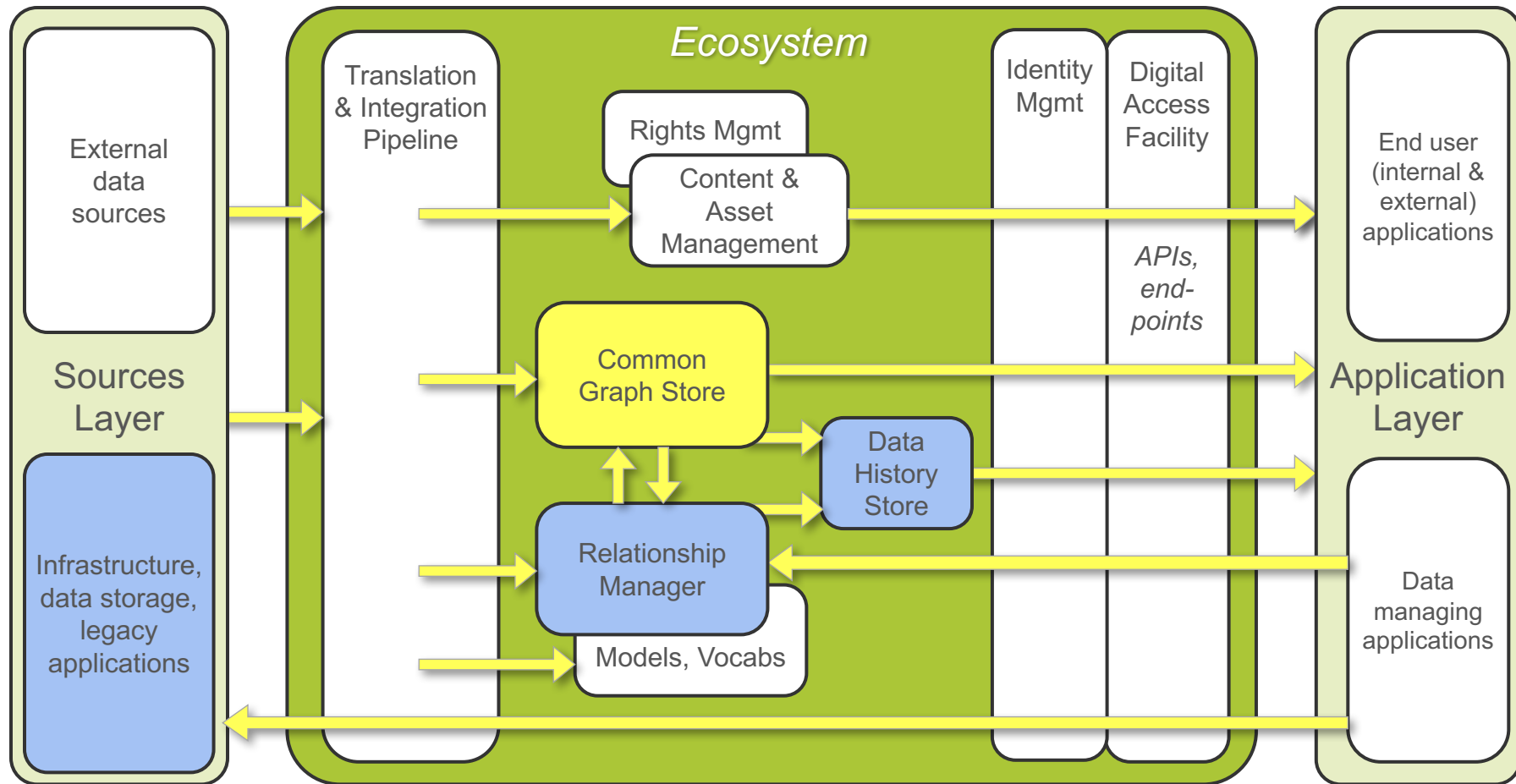
Museum Linked Data provenance modeling

ArtTracks.
 Carnegie Museums,
 Smithsonian Freer|Sackler,
 Yale Center for British Art,
 Getty Research Institute.
<http://museumprovenance.org>

Model presented 10.2016



Flexible Digital Environments



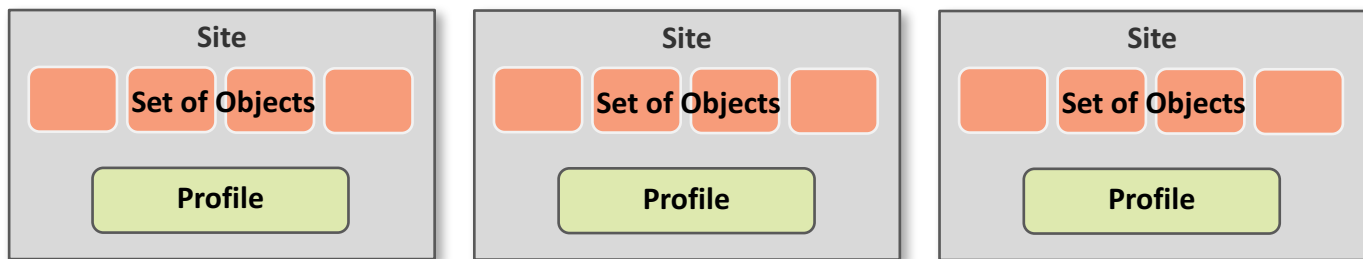
Plan for change

...with Open Access and Linked Open Data...

**You're making a commitment to the community
that your content and data will be available.**

Persistent URLs are vital !

Personalization now: Typically a closed-world scenario



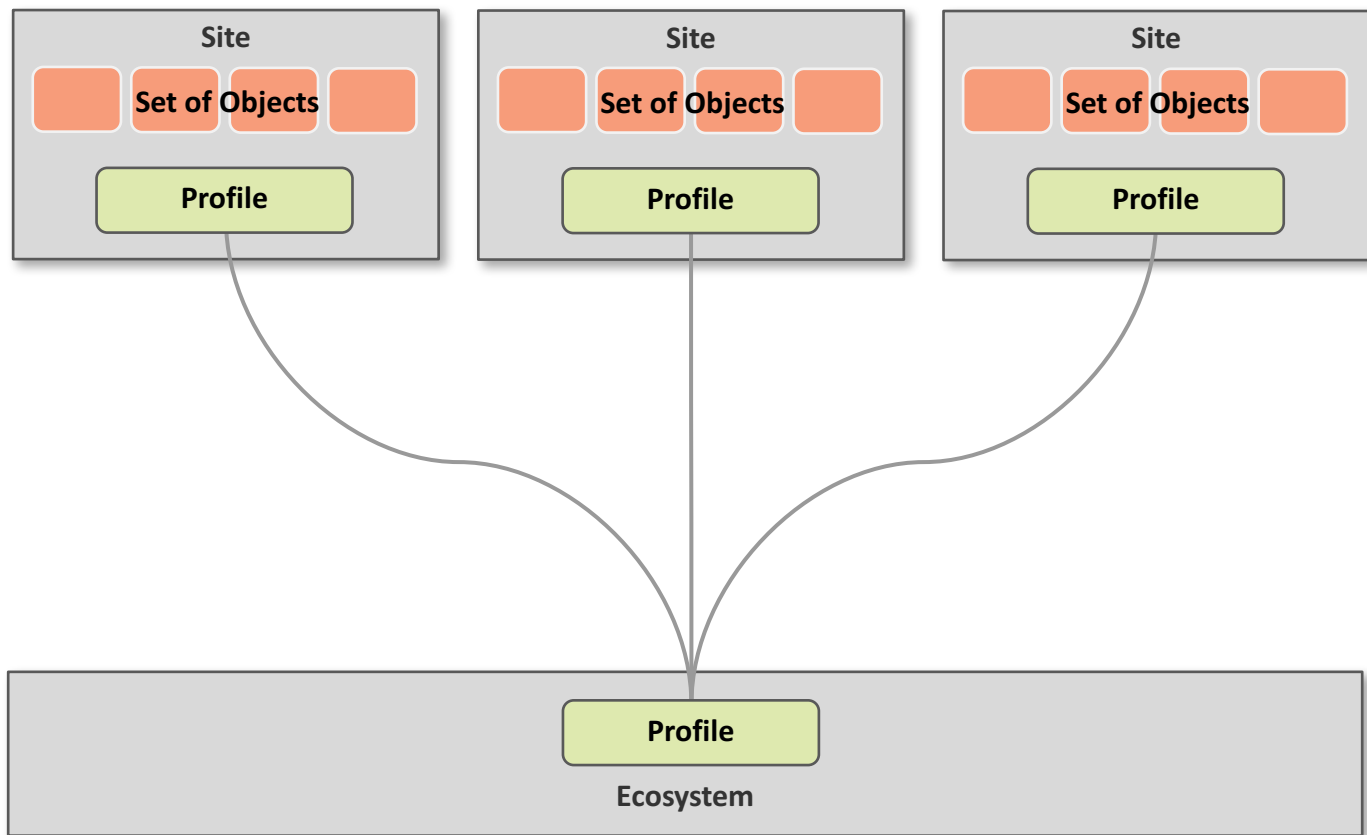
A site has an model (information architecture)

Every asset has a model (metadata and classification)

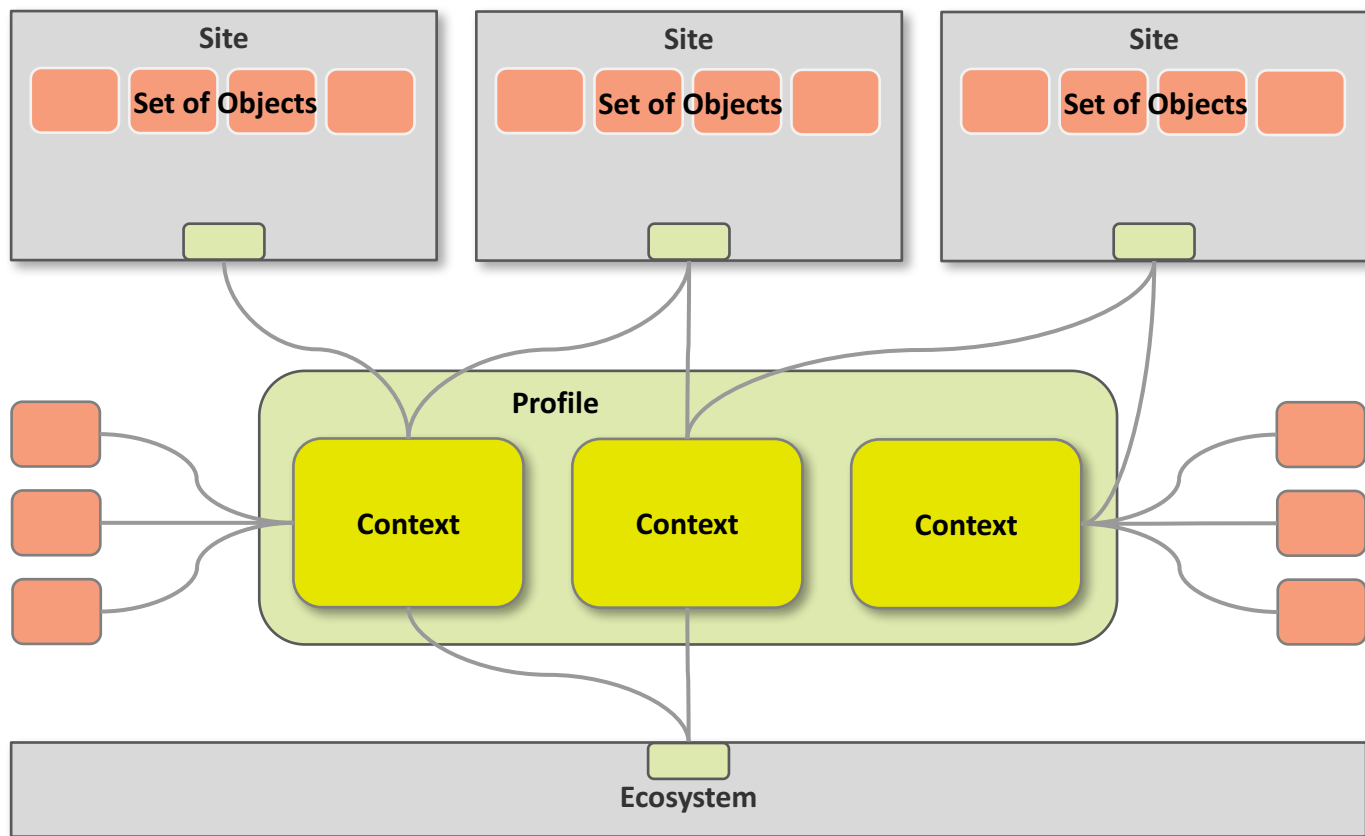
Every user has a model (personal interests and experience)

They rarely talk to each other...!

Even ecosystems behave as (semi) closed-worlds



Personalization future: Requires open-world scenarios



Linked Data design requirements

- Discovery & Serendipity
 - Discover relevant information objects – known and unknown (and foster that “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 resources and different working styles

The value propositions for linked data

- **Maturity, flexibility, tools**

- A next-generation data standard
- An active, world-spanning community
- Flexibility in adoption, integration
- Expanding / maturing tools

- **Do more with your content**

- Eliminate silos
- Avoid one-off single-use content and applications
- Manage content more effectively
- Improve analytical capability

- **Enhance the user experience**

- Increase discoverability and serendipity
- Push the boundaries on interaction
- Serve audiences better, attract new ones
- Bridge the physical and digital realms

- **A pioneering opportunity**

- Demonstrate leadership, define a legacy
- Exercise a spirit of engagement

- **Increase your reach**

- The promise and challenge of “openness”
- Visibility and authority at “web scale”
- Enhance/extend organizational partnerships

Innovative Applications And Data Sharing With Linked Open Data In Museums

Museums & the Web • April 19, 2017

bit.ly/mw17dfc



Design for Context

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

Duane Degler

🐦 @ddegler

*With contributions from Neal Johnson,
Joan Cobb, Lesley Humphreys*