

Library Linked Data

PRATT INFO-653

Knowledge Organization

NOV 29, 2022

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Your answer ...

- ▶ As a <your role> ...
- ▶ How do you define linked data?
- ▶ What do you expect from linked open data?

Topics

- Linked data
 - History, semantics, syntax, serializations
 - URIs vs dereferenceable URIs
- Library community's LOD projects
 - IFLA LRM, RDA/RDF (Official RDA), BIBFRAME
 - BIBFRAME Implementations (Sinopia (PCC Libraries), Share-VDE, Sweden, Hungary)
 - Thesauri, vocabularies, ontologies (FAST, VIAF, authority files (LoC, DNB's GND), MeSH, Getty vocabularies)
- Linked open data platform
 - Wikidata

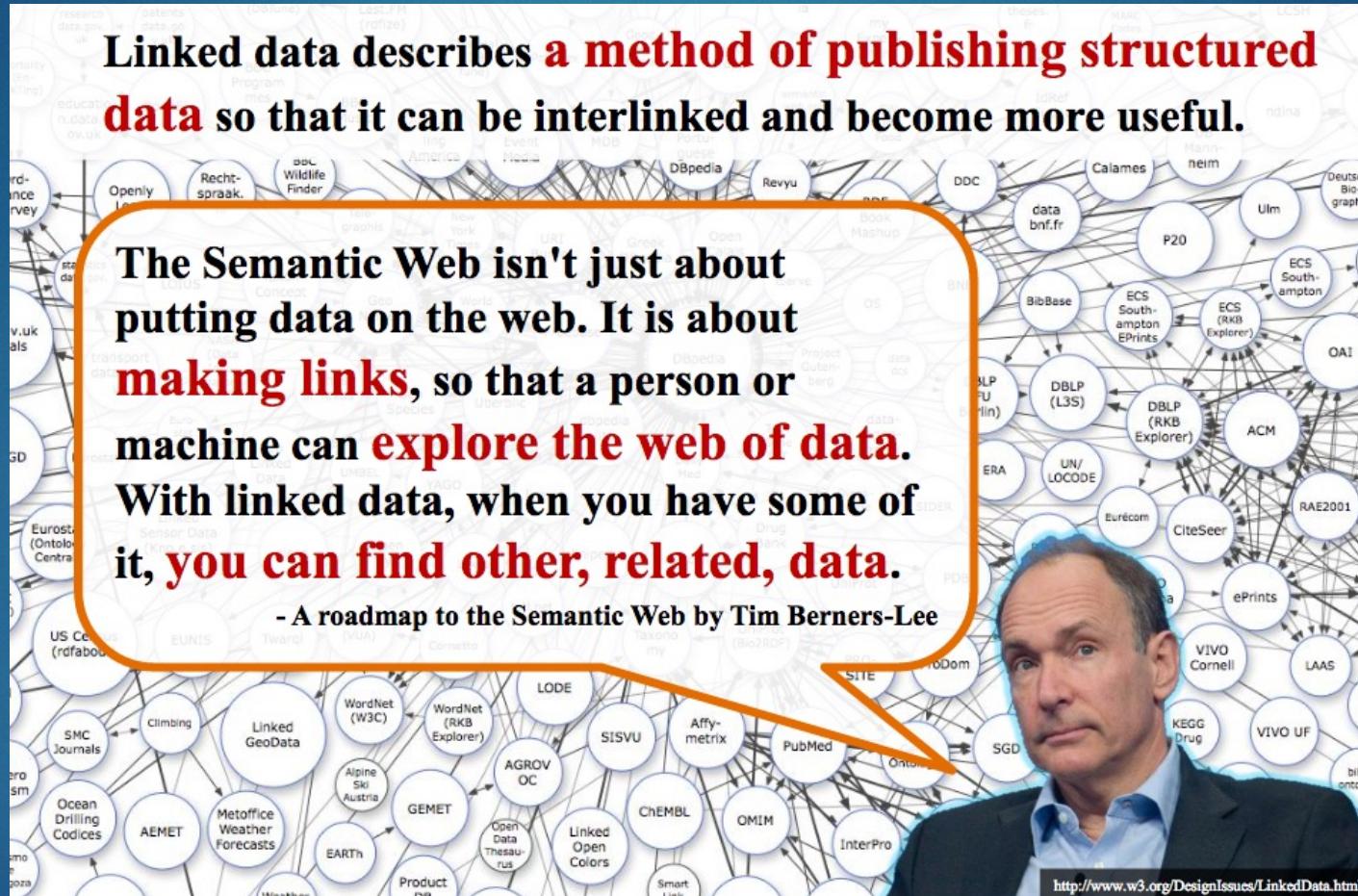
Linked Data



Things to consider

- ▶ What is Linked data and why?
- ▶ What is Resource Description Framework (RDF)?
- ▶ What is a Uniform Resource Identifier (URI)?
- ▶ What is a dereferenceable (RDF) URI?
- ▶ What skills will be needed?

Why Linked data



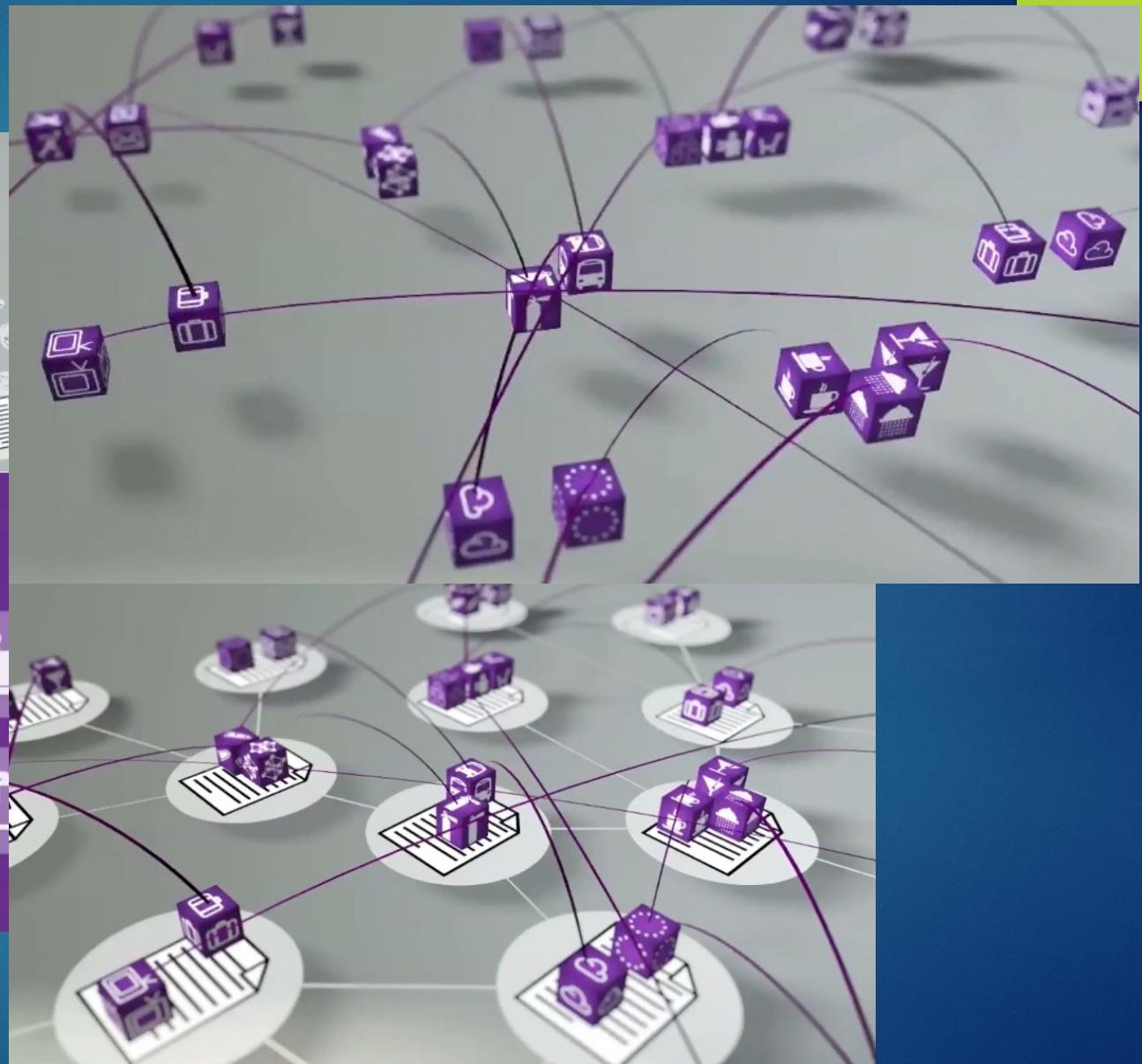
Linked data principles

- ▶ Use URIs for names for THINGS
- ▶ Use HTTP URIs for lookup
- ▶ Use open standards (e.g. RDF) in non-proprietary formats
- ▶ Include links to other URIs

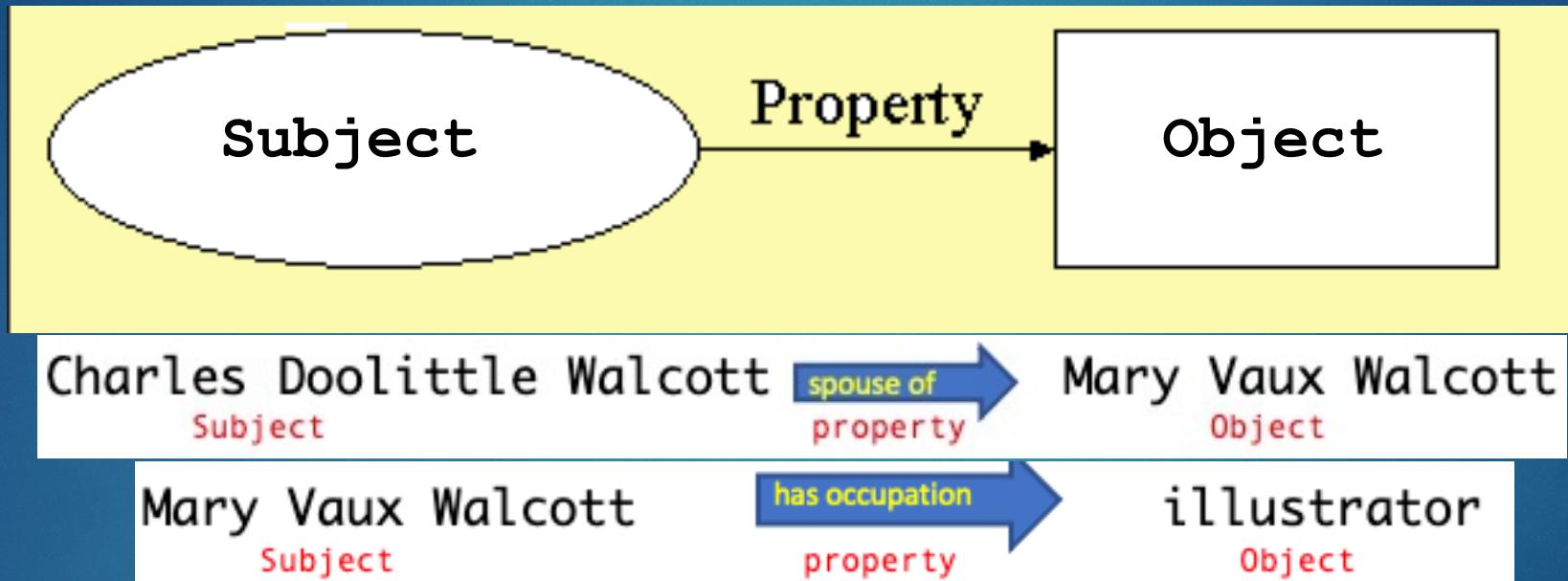


<http://w3.org/DesignIssues/LinkedData.html>

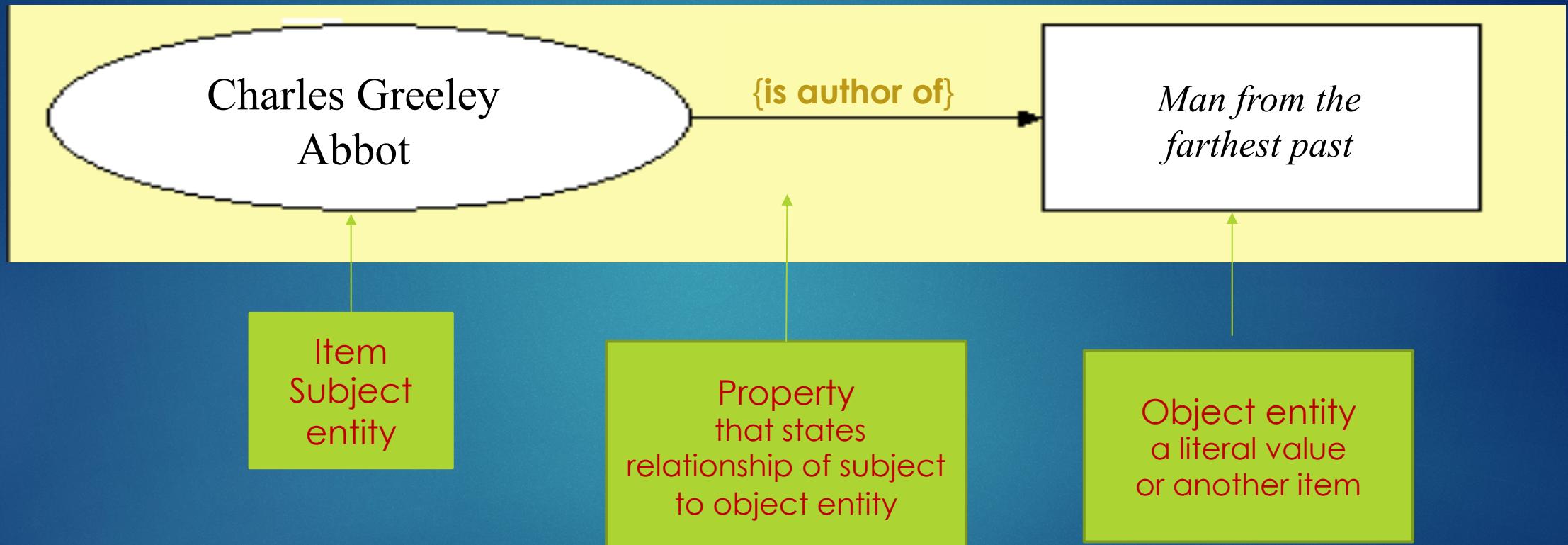
First things first



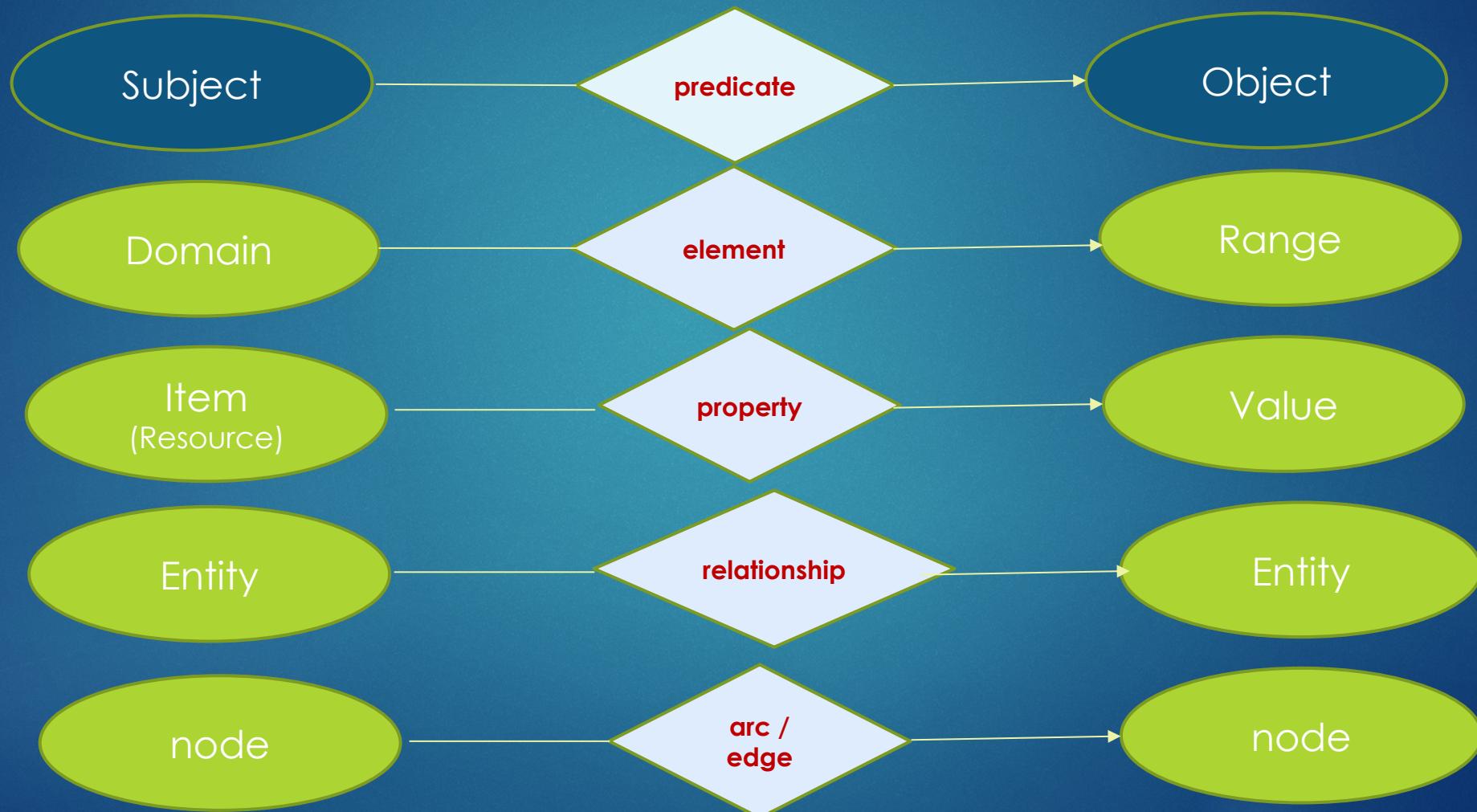
Resource Description Framework (RDF)



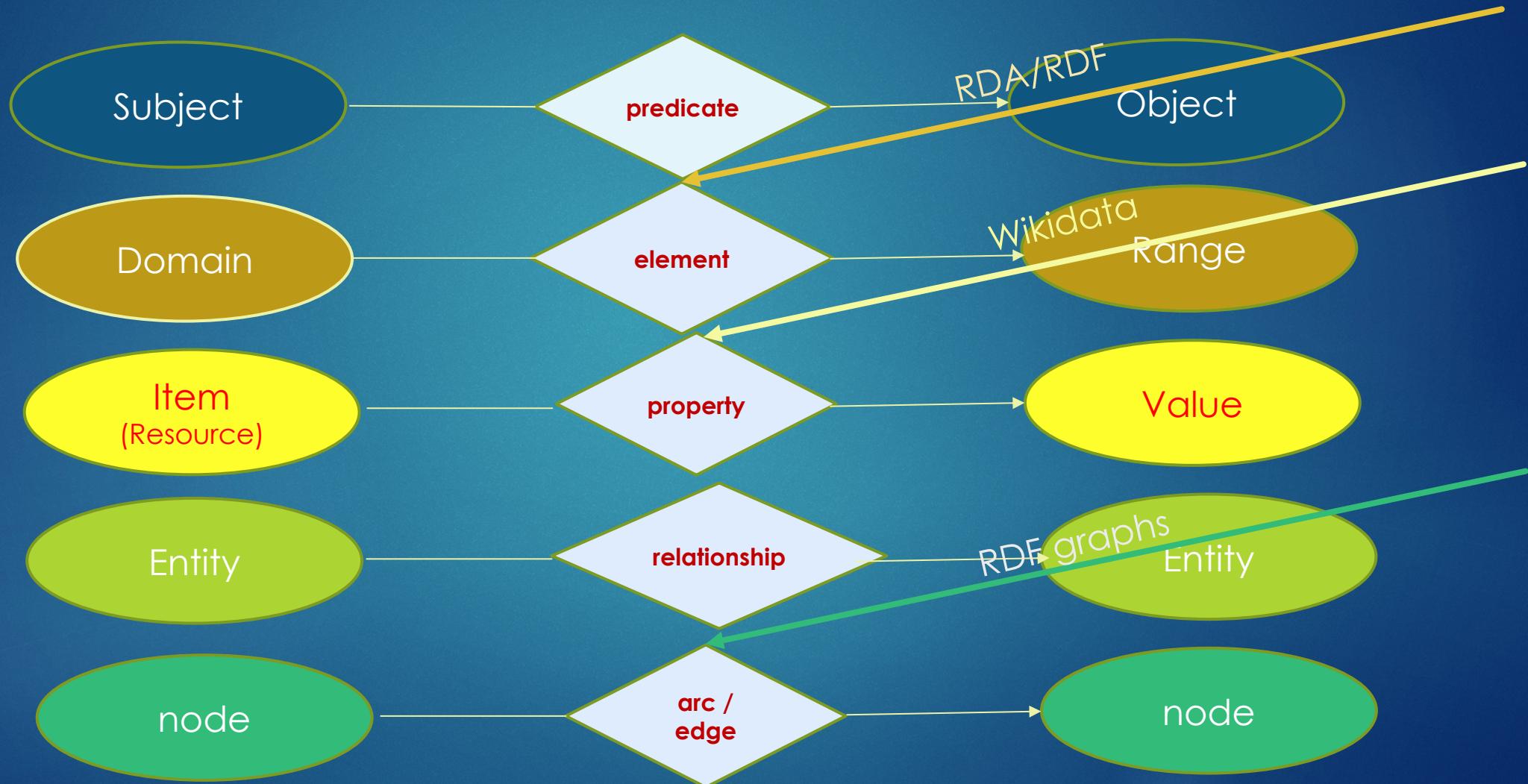
An entity statement



RDF applications



RDF applications



What is a Uniform Resource Identifier (URI)

A **Uniform Resource Identifier (URI)** is a **string** of characters that unambiguously **identifies** a particular **resource**. To guarantee **uniformity**, all URIs follow a predefined set of syntax rules,^[1] but also maintain **extensibility** through a separately defined **hierarchical naming scheme** (e.g. <http://>).

scheme:[//authority(DNS)]path[?query][#fragment]

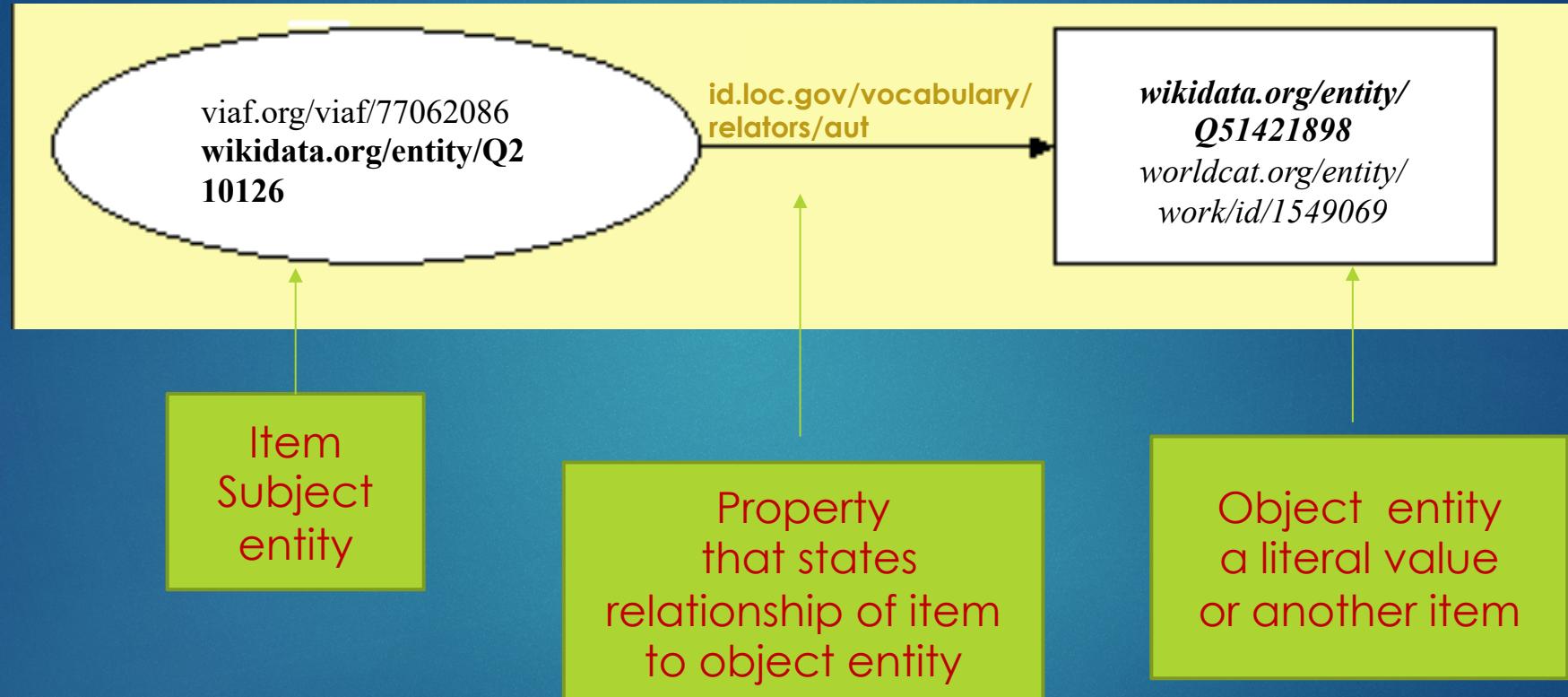
Types	Example
URN	urn:isbn:0-476-27557-4
URL	https://www.pratt.edu

Dereferenceable URI

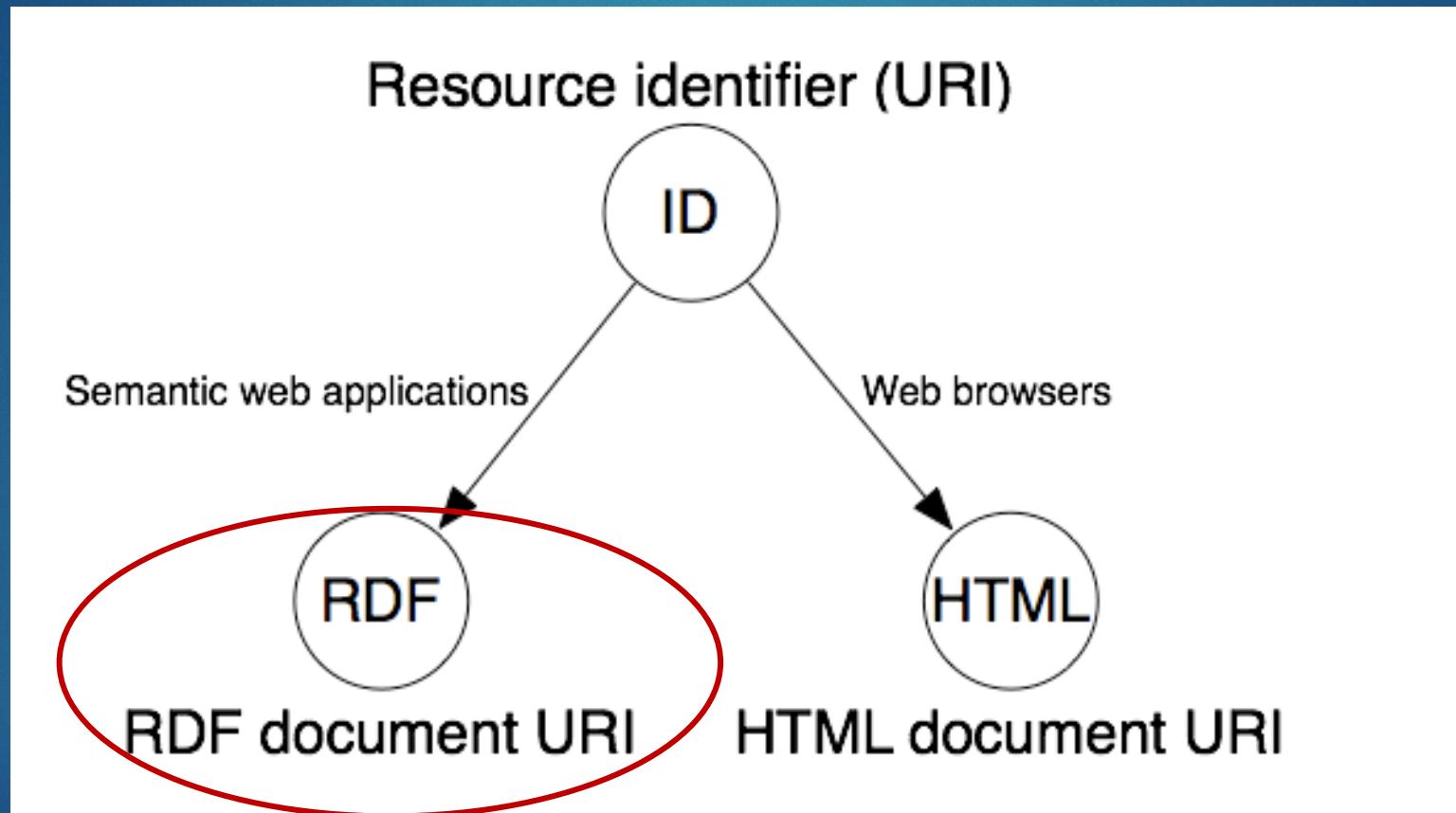
Use Web protocols to retrieve a representation of the resource the URL identifies

Scheme/Protocol	Description
ftp	File Transfer Protocol
http/https	Hyper text transfer protocol (Secure)
mailto	Electronic mail address
ssh	Secure shell
tel	telephone
urn	Uniform Resource Names

URI replacing label



Not all URIs are equal



RDF serializations

- ▶ RDF/XML
- ▶ RDFa
- ▶ JSON-LD (JavaScript Object Notation
Linked Data)
- ▶ N3 (Notation 3)
- ▶ TTL (*Turtle, Terse RDF Triple Language*)

► Exercise: RDF URLs vs URLs

Mary Vaux Walcott

- ▶ LoC's Linked data service
<http://id.loc.gov/authorities/names/n86012335>
- ▶ VIAF
<http://viaf.org/viaf/43313923>
- ▶ BnF
<http://data.bnf.fr/17899334>
- ▶ DNB
<http://d-nb.info/gnd/1098348362>
- ▶ Wikidata
<http://wikidata.org/entity/Q6780882>
- ▶ DbPedia
http://dbpedia.org/resource/Mary_Vaux_Walcott
- ▶ FAST
<http://id.worldcat.org/fast/195746>

Knowledge and skills

- ▶ Record- (cataloging) to entity-based (modelling) descriptive data
- ▶ Fundamentals of RDF and Linked data
- ▶ Management of identities and linking among them
- ▶ Ability to design, maintain, publish, and map RDF vocabularies and application profiles
- ▶ Ability to create, transform and interact with RDF data
- ▶ Ability to generate linked data applications

► Your answer...

- Are you enthusiastic about the change?
- What is the RDF data model and components?
- Are you comfortable with the principles of things with URI?
- Can you shed light on a URI pointing to a thing and one pointing to a page about the thing?



Cataloging standards
in transition

Entity-Relationship

Library community's efforts

- ▶ IFLA's functional requirements data models
- ▶ Library of Congress's Bibliographic Framework (BIBFRAME)
- ▶ JSC's Resource Description & Access (RDA) 3-R project (restructure and redesign)
- ▶ LD4 projects

IFLA's conceptual models

- ▶ 1998: Functional Requirements for Bibliographic Records (FRBR)
- ▶ 2009: Functional Requirements for Authority Data (FRAD)
- ▶ 2010: Functional Requirements for Subject Authority Data (FRSAD)

IFLA Library Reference Model (LRM)

Entity Hierarchy		
Top Level	Second Level	Third Level
LRM-E1 RES		
--	LRM-E2 Work	
--	LRM-E3 Expression	
--	LRM-E4 Manifestation	
--	LRM-E5 Item	
--	LRM-E6 Agent	
--	--	LRM-E7 Person
--	--	LRM-E8 Collective Agent
--	LRM-E9 Nomen	
--	LRM-E10 Place	
--	LRM-E11 Time-span	

http://ofla.org/files/assets/cataloguing/frbr-lrm/ifla-lrm-august-2017_rev201712.pdf

RDA Entity model

RDA Entities

- RDA Entity
 - Note capital “E”
- Work
- Expression
- Manifestation
- Item
- Place
- Agent
- Person
- Collective Agent
- Corporate Body
- Family
- Nomen
- Timespan

<http://rdaregistry.info>

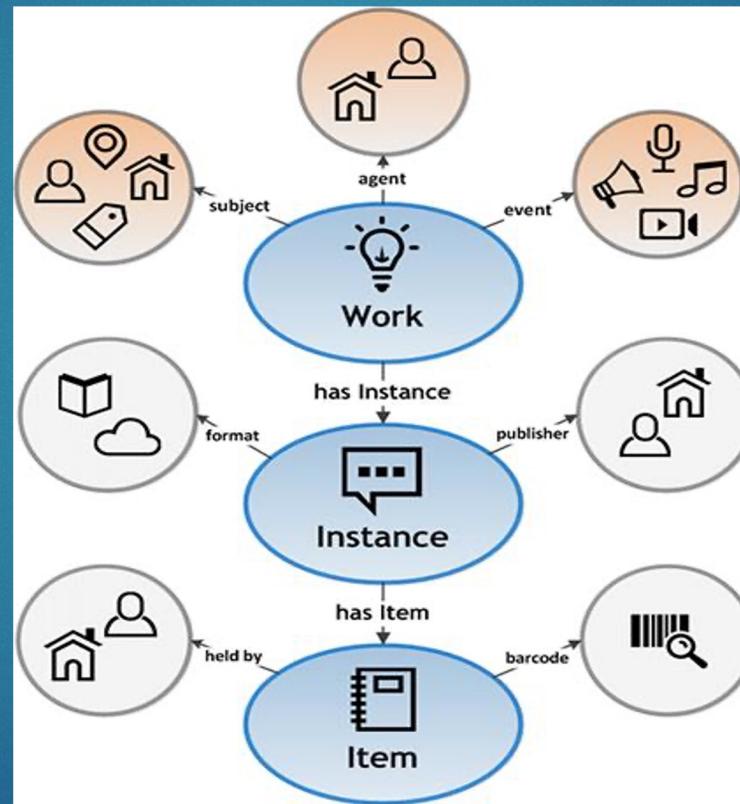
- **entity subtype**
- **entity supertype**

RDA Terminology:

Domain — element — Range

- ▶ Domain—The RDA entity that is described by an element
- ▶ Range—The RDA entity that is the value of a relationship element
- ▶ Element—Every element in RDA has a Domain but only relationship elements have a Range

BIBFRAME bibliographic data model



<http://loc.gov/bibframe/docs/bibframe2-model.html>

LC BIBFRAME Implementation

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- ▶ FY 2022: accommodates 350 catalogers cataloging in BIBFRAME Editor five days a week
- ▶ Conversion processes in place
 - ▶ MARC2BIBFRAME
 - ▶ BIBFRAME2MARC

http://www.casalini.it/bfwe2021/web_content/2021/presentations/mccallum.pdf

Other BIBFRAME implementations

- ▶ LD4 Sinopia
<http://sinopia.io>
- ▶ National Library of Sweden (BF +)
<http://tinyurl.com/SwedenBF>
- ▶ National Széchényi Library of Hungary
<https://www.linkedin.com/pulse/bibframe-library-hungarian-national-museum-adam-horvath>
- ▶ Share VDE (Virtual Discovery Environment)
<http://svde.org>

Thesauri & vocabularies

- ▶ Identity services (LoC, DNB's GND, BnF's FNE)
- ▶ OCLC's FAST, VIAF, *Entities*, Classify, Identities, CONTENTdm
- ▶ NLM's MeSH
- ▶ Getty vocabularies (AAT, ULAN)
- ▶ Many more



Entity-relationship example

Text-centric system

100 1_ |a Austen, Jane, |d 1775-1817

370 _ |a Steventon (Hampshire, England) |b Winchester (England) |c England |c Great Britain |e Bath (England) |2 naf

372 _ |a Fiction |2 lcsh

374 _ |a Authors |a Novelists |2 lcsh

375 _ |a female

377 _ |a eng

Pride and prejudice / Jane Austen.

Record info:

Main Author [Austen, Jane, 1775-1817.](#)

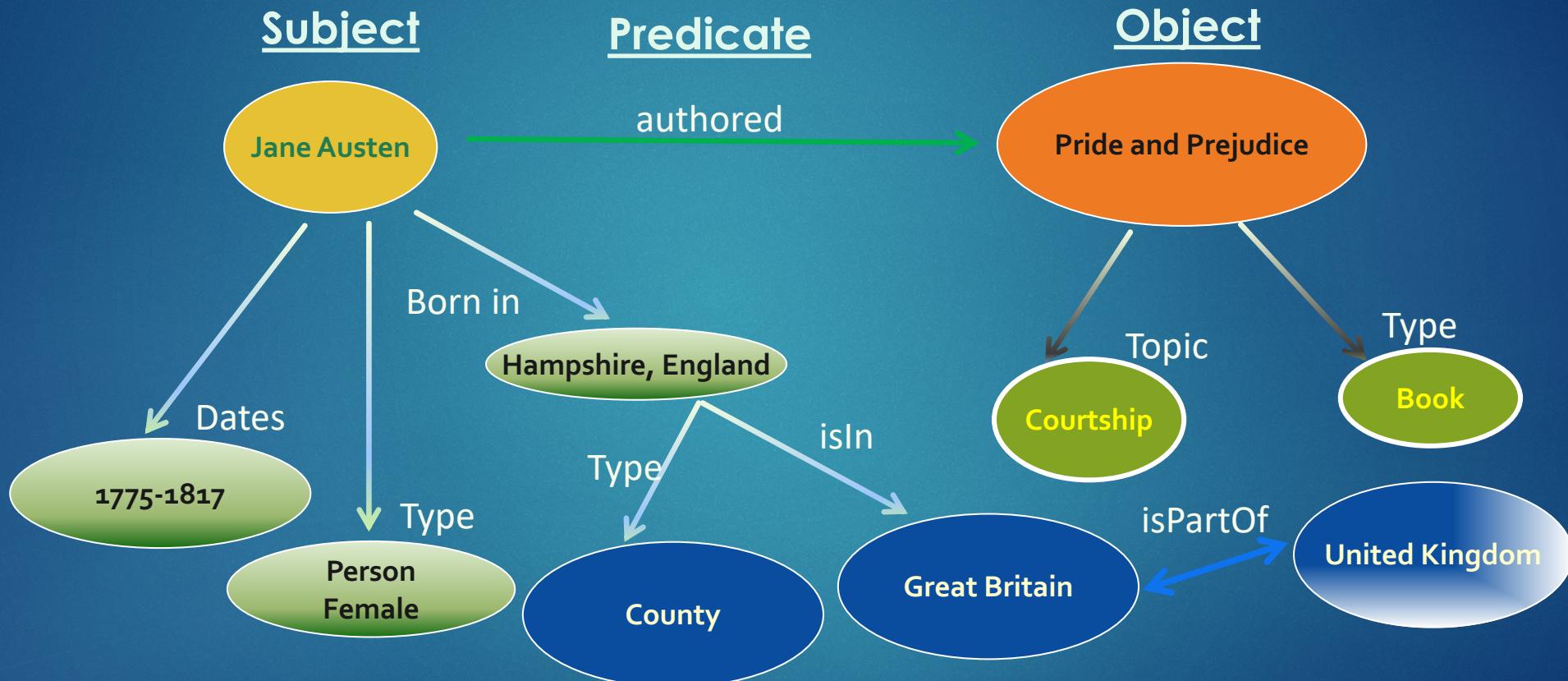
Published/Created 2007 - Ann Arbor, MI : Borders Classics,

Language English

Subjects (LCSH) [Courtship -- Fiction.](#)

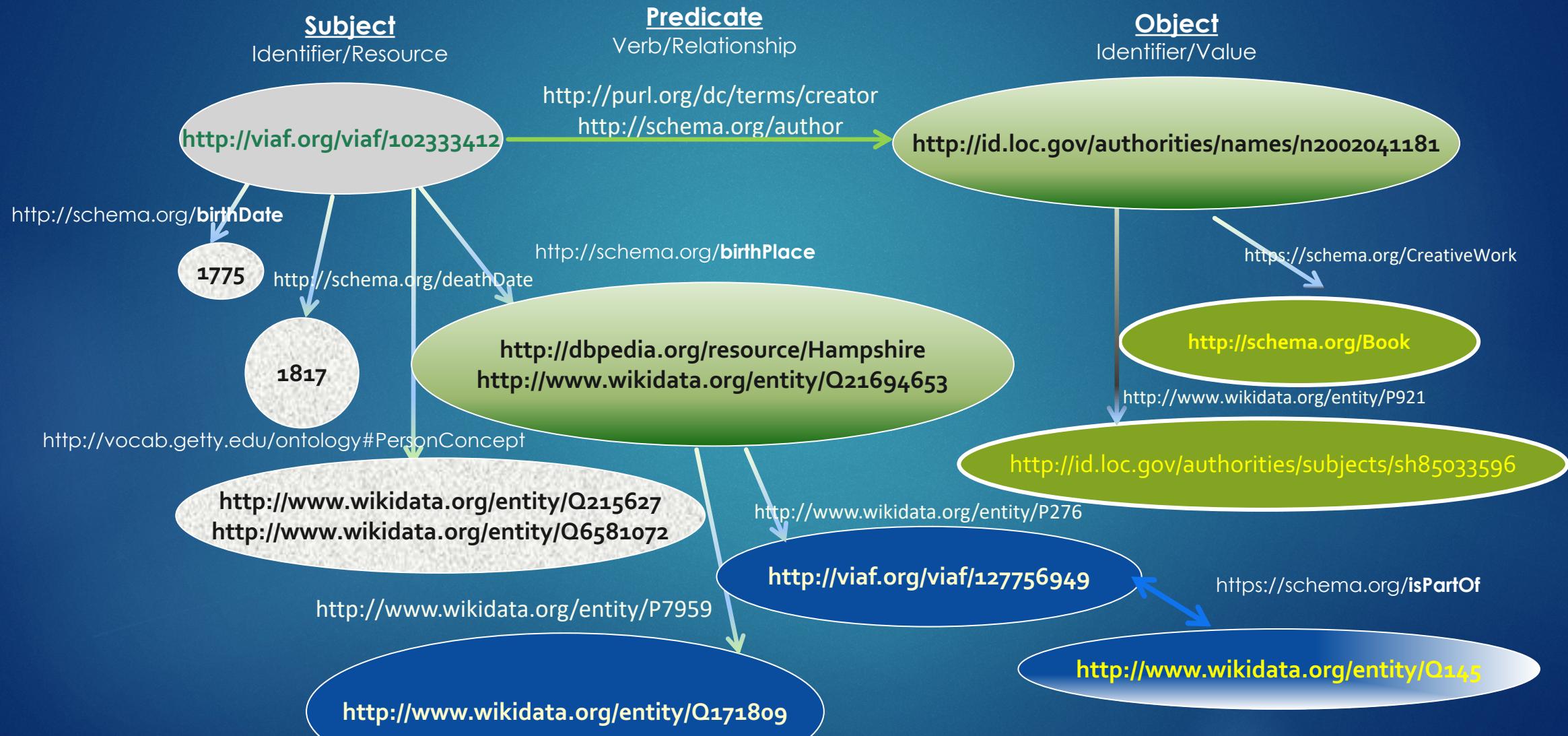
[Show all 5](#)

Entity-Relationship



HTTP URIs

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BIBFRAME editors

► Marva

<https://bibframe.org/marva/editor/>

► Sinopia

<https://sinopia.io>

https://bibframe.org/marva/editor/edit/e2238735



Work

- ✓ Creator of Work
- ✓ Title Information
 - Work Title
 - Variant Title
- ✓ Form/Genre
- ✓ Government publication
- ✓ Date of Work
- ✓ Place of Origin of the Work
- ✓ (Geographic) Coverage of the Content
 - (Time) Coverage of the Content
- ✓ Intended Audience
- ✓ Other contributors
 - Notes about the Work
 - Dissertation
 - Contents
 - Summary
 - Subject of the Work

https://bibframe.org/marva/editor/edit/e2238735

Actions Options Log Manual Saved </> Axiom Sailboat

Work /resources/works/72fff1f8-15ce-4ec7-a3a1-c4935ff65e96

Creator of Work

Person Search LCNAF   

Austen, Jane, 1775-1817 | ✓ | change | x

Relationship Designator

Author | ✓ | x

Title Information

Work Title
Preferred Title for Work
Pride and Prejudice

Part number

Part name

SINOPIA - STAGE

Dashboard Editor Resource Templates Actions Search i SHAREVDE PCC Opus pride and prejudice Close Save

PCC BF2 Work (Monograph) WORK

Unable to load the entire resource. The unused triples are listed below. View as: Table (RDF) ▾

Subject	Predicate	Object
https://svde.org/Contribution_100/d4db35c3-5c9e-3674-898d-315b07362fb1	http://id.loc.gov/ontologies/bibframe/agent	https://svde.org/agents/281631290196733
https://svde.org/agents/281631290196733	http://www.w3.org/2000/01/rdf-schema#label	MacKaye, Mary Keith Medbery, 1845-1924.
https://svde.org/title_996/4ba4a9a4-8ec7-3457-96e4-3e6696a91967	http://www.w3.org/2000/01/rdf-schema#label	Pride and prejudice

has Manifestation (BIBFRAME Instance)

> **Work Title**

> **Variant Work Title**

Class Work (<http://id.loc.gov/ontologies/bibframe/Work>)
 Optional Text (<http://id.loc.gov/ontologies/bibframe/Text>)
 classes

has Manifestation (BIBFRAME Instance) + Add



Discussion?

Wiki platform

Common terms

- ▶ **Wiki** – a collaborative platform for writing and publishing via a user agent (e.g., browser)
- ▶ **Wikipedia** – a collaboratively edited, multilingual, free Internet encyclopedia supported by the non-profit Wikimedia Foundation
- ▶ **Wikidata** – a *global database (repository), hosting structured data in triples*
- ▶ **Triple statement** – "this" "is" "that" (subject item (Q#))—property (P#)—object item (Q#))
- ▶ **Wikibase** – a software that powers Wikidata and supports structured data

Common terms (cont.)

- ▶ **Data modeling** – analyze data requirements to support logic, structure, discoverability, context, etc.
- ▶ **Serialization** – flavors of data output formats (e.g., RDF/XML, JSON, TTL, N3, etc.)
- ▶ **Visualization** – visual forms of data representation (e.g., tables, charts, maps, etc.)
- ▶ **Node** – an active, physical device attached to a network, capable of transmitting data

Why Wiki platform?

WHY LINK YOUR LIBRARY DATA WITH WIKIDATA?



- Wikimedia Movement Strategy: “A world in which every single human being can freely share in **the sum of all knowledge**”
- By 2030, Wikimedia will become the essential infrastructure of the ecosystem of free knowledge
- Wikidata already connects many controlled vocabularies, authority files, and ontologies used in the GLAM sector and beyond
- It is multilingual
- Wikidata as a hub to connect data between GLAM institutions

Wikimedia family

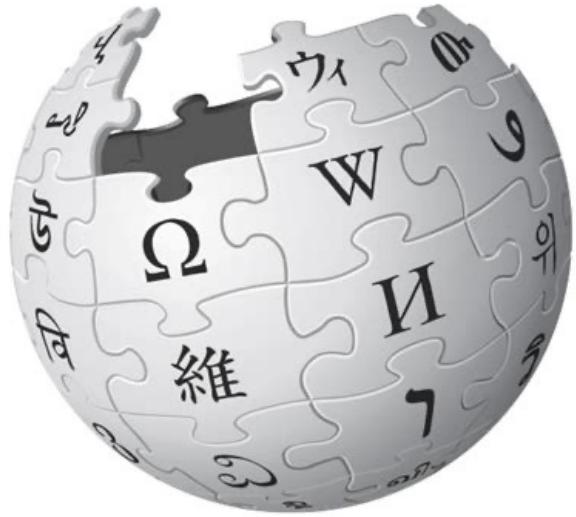
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<http://mediawiki.org>



meta.wikimedia.org/wiki/Wikimedia_movement#/media/File:Wikimedia_logo_family_complete-2021.svg



<http://wikipedia.org>

Online encyclopedia a free content, multilingual online encyclopedia contributed by a community of volunteer on an open collaboration, wiki-based editing system, and supported by Wikidata



<http://commons.wikimedia.org>

a **media repository**, of freely available and reusable media files, in all languages, supporting all Wikimedia projects, e.g., Wikipedia, Wikivoyage, Wikisource, Wikiquote, Wiktionary, Wikinews, Wikibooks, and Wikispecies



<http://wikidata.org>

To collect world's knowledge in a structured manner to benefit all who seek knowledge

data repository that is open, free, collaborative, and multilingual, which collects structured data to support Wikipedia, Wikimedia Commons, and many other Wiki projects

item	property	value
Marie Curie	field of work	chemistry
Q7186	P101	Q2329

an **online digital library** of multidisciplinary open-content ebook library in 72 languages, over 500K English texts among others, comics, and audio books



<http://wikisource.org>

a collection of open-content textbooks; including annotated texts, instructional guides, and manuals



<https://wikibooks.org>

Interconnectivity

Robert Louis Stevenson

From Wikipedia, the free encyclopedia

Robert Louis Balfour Stevenson (13 November 1850 – 3 December 1894) was a Scottish novelist, poet, essayist, and travel writer. His most famous works are *Treasure Island*, *Kidnapped*, *Strange Case of Dr Jekyll and Mr Hyde* and *A Child's Garden of Verses*.

A literary celebrity during his lifetime, Stevenson now ranks among the 26 most translated authors in the world.^[1] His works have been admired by many other writers, including Jorge Luis Borges, Bertolt Brecht, Marcel Proust, Arthur Conan Doyle, Henry James, Cesare Pavese, Ernest Hemingway, Rudyard Kipling, Jack London, Vladimir Nabokov,^[2] J. M. Barrie,^[3] and G. K. Chesterton, who said of him that he "seemed to pick the right word up on the point of his pen, like a man playing spilleskis".^[4]

```

graph TD
    W[WIKIPEDIA  
The Free Encyclopedia] <--> WC[WIKIMEDIA COMMONS]
    W <--> WD[WIKIDATA]
    W <--> WS[WIKISOURCE]
    WC <--> WD
    WD <--> WS
  
```

Works [edit | edit source]

Novels [edit | edit source]

- Treasure Island (1883)
- Prince Otto (1885)
- Strange Case of Dr Jekyll and Mr Hyde (1886)
 - The Annotated Strange Case of Dr Jekyll and Mr Hyde
- Kidnapped (*Adventures of David Balfour*, 1886)
- The Black Arrow (1888)
- The Master of Ballantrae (1889) (External scan)
- Catriona (*Adventures of David Balfour*, 1893)
- Weir of Hermiston (1896, unfinished)
- St. Ives (1898, unfinished)

with Lloyd Osbourne [edit | edit source]

- The Wrong Box (1889) (External scan)
- The Wrecker (1892)
- The Ebb-Tide (1894) (External scan)

Short stories [edit | edit source]

- A Lodging for the Night (1877)
- The Sire de Maletroit's Door (1878)

Public Domain pic of Robert Louis Stevenson

https://commons.wikimedia.org/wiki/File:Robert_Louis_Stevenson_by_Henry_Walter_Barnett.jpg

ROBERT LOUIS STEVENSON (Q1512)

Spouse (P26): Fanny Stevenson Q3066501

Place of birth (P19): Edinburgh Q23436

Place of death (P20): Vailima, Samoa Q548806

Father (P22): Thomas Stevenson Q325068

Educated at (P69): Edinburgh Uni Q160302

Occupation (P106): Writer Q38180

Poet Q49757

Novelist Q6625963

Essayist Q11774202

Image: thinking.is.ed.ac.uk/wikidata-workshop/structured-linked-open-data/

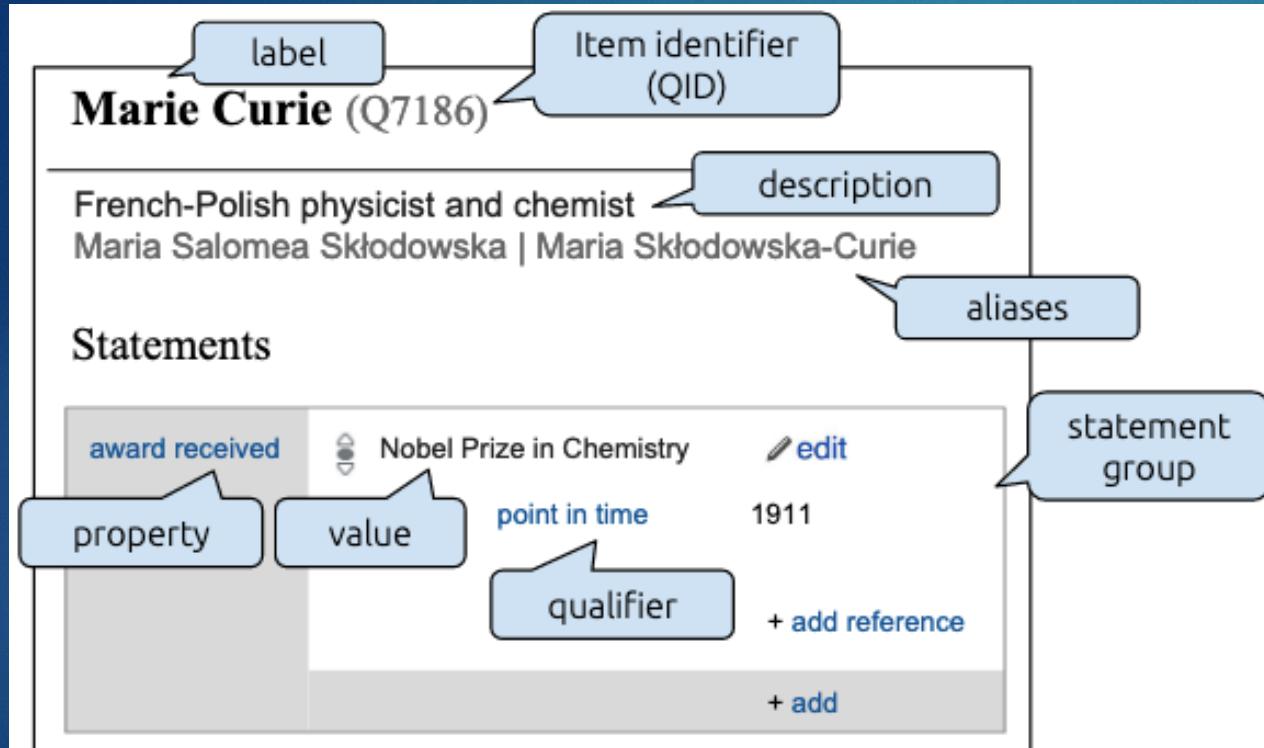


Wikidata

A Semantic Web realized

A central storage for Wikimedia sister projects

Wikidata anatomy and uses



wikidata.org/wiki/WD:1

- ▶ Identifiers clearing house
- ▶ A repository connecting facts about people, places, things, and concepts
- ▶ A host for data reuse in other projects

Entity relationship



Man from the farthest past, by C W Bishop, Charles Greeley Abbot and Aleš Hrdlicka

[Smithsonian Libraries and Archives](#)

Object Details

Author

Bishop, Carl Whiting

Abbot, C. G (Charles Greeley) 1872-1973

Hrdlicka, Aleš 1869-1943

1930

https://si.edu/object/siris_sil_40341

Author:

Title:

Publisher:

Description:

Series:

Notes:

Bibliography Note:

Subject:

Genre:

Added Author:

Added Series:

Bishop, Carl Whiting, 1881-1942 author

Man from the farthest past / by Carl Whiting Bishop ... with the collaboration of Charles Greeley Abbot ... and Aleš Hrdlicka

[New York] [Smithsonian Institution series, Incorporated] 1930

6 preliminary leaves, iii, 375 pages color frontispiece, illustrations (including map)
100 plates (some color) on 65 leaves 25 cm

Smith. Sci. Seri. ; -- v. 7

On cover: Patrons edition

One of the plates accompanied by guard sheet with descriptive letterpress

Includes bibliographical references (pages 352-358)

Anthropology

Prehistoric peoples

Civilization -- History

Anthropology

Civilization

Prehistoric peoples

Anthropology

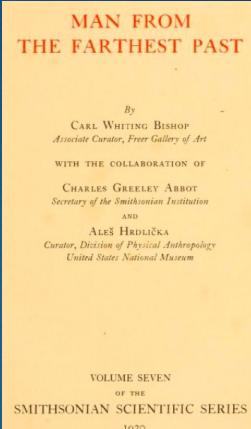
Civilization -- history

History

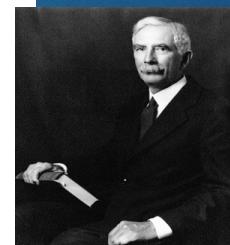
Abbot, C. G. (Charles Greeley) 1872-1973 author

Hrdlicka, Aleš 1869-1943 author

Smithsonian scientific series ; v. 7



<http://worldcat.org/entity/work/id/1549069>



Charles Greeley Abbot

<http://viaf.org/viaf/77062086>
<http://id.loc.gov/authorities/names/n50039868>

author [of]
<http://id.loc.gov/vocabulary/relators/aut>

Name authority data

LC control no.: n 50039868

LCCN Permalink: <https://lccn.loc.gov/n50039868>

Personal name heading: Abbot, C. G. (Charles Greeley), 1872-1973

Variant(s): Abbot, Charles Greeley, 1872-1973

Special note: Includes the old catalog headings: Abbot, Charles Greeley, 1872- ; Abbot, Charles Greeley.

Found in: The 1900 solar eclipse exped. of Astrophys. observ. of Smithson. Inst.

LCCN 04-33116: Smithsonian Astrophysical Observatory. The 1900 solar eclipse expedition
... 1904 (hdg.: Abbot, Charles Greeley; usage: C.G. Abbot)

LC data base, 7-20-87 (hdg.: Abbot, Charles Greeley, 1872- ; usage: C.G. Abbot)

LCCN 29-1821: Abbot, C.G. The sun, 1929: (hdg.: Abbot, Charles Greeley, 1872- ; usage:
Charles G. Abbot)

NUCMC data from Smithsonian Inst. Archives for Smithsonian Institution oral history project,
1974-1985 (Charles G. Abbot, 1872-1973; Smithsonian Institution secretary)

National Academy of Sciences, Biographical memoirs, WWW site, June 24, 2008: (b. May
31, 1872; d. Dec. 17, 1973)

Name entity in RDF

```

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    <rdf:type rdf:resource="http://www.loc.gov/mads/rdf/v1#Authority"/>
    <madsrdf:authoritativeLabel>Abbot, C. G. (Charles Greeley), 1872-1973</madsrdf:authoritativeLabel>
    <madsrdf:elementList rdf:parseType="Collection">
      <madsrdf:FullNameElement>
        <madsrdf:elementValue>Abbot, C. G.</madsrdf:elementValue>
      </madsrdf:FullNameElement>
      <madsrdf:FullNameElement>
        <madsrdf:elementValue>(Charles Greeley)</madsrdf:elementValue>
      </madsrdf:FullNameElement>
      <madsrdf:DateNameElement>
        <madsrdf:elementValue>1872-1973</madsrdf:elementValue>
      </madsrdf:DateNameElement>
    </madsrdf:elementList>
    <madsrdf:hasVariant>
      <madsrdf:PersonalName>
        <rdf:type rdf:resource="http://www.loc.gov/mads/rdf/v1#Variant"/>
        <madsrdf:variantLabel>Abbot, Charles Greeley, 1872-1973</madsrdf:variantLabel>
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        <madsrdf:FullNameElement>
          <madsrdf:elementValue>Abbot, Charles Greeley</madsrdf:elementValue>
        </madsrdf:FullNameElement>
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      </madsrdf:elementList>
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    <madsrdf:hasCloseExternalAuthority>
      <madsrdf:Authority rdf:about="http://www.wikidata.org/entity/Q210126">
        <madsrdf:authoritativeLabel>Charles Greeley Abbot</madsrdf:authoritativeLabel>
      </madsrdf:Authority>
    </madsrdf:hasCloseExternalAuthority>
    <madsrdf:hasCloseExternalAuthority>
      <madsrdf:Authority rdf:about="http://id.worldcat.org/fast/13632">
        <madsrdf:authoritativeLabel>Abbot, C. G. (Charles Greeley), b. 1872</madsrdf:authoritativeLabel>
      </madsrdf:Authority>
    </madsrdf:hasCloseExternalAuthority>
    <madsrdf:hasCloseExternalAuthority>
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    </madsrdf:hasCloseExternalAuthority>
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    <madsrdf:hasCloseExternalAuthority rdf:resource="http://id.worldcat.org/fast/1716618"/>
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    <madsrdf:identifiesRWO>
      <madsrdf:RWO rdf:about="http://id.loc.gov/rwo/agents/n50039868">
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        <rdf:type rdf:resource="http://xmlns.com/foaf/0.1/Person"/>
        <rdfs:label>Abbot, C. G. (Charles Greeley), 1872-1973</rdfs:label>
      </madsrdf:RWO>
    </madsrdf:identifiesRWO>
  </madsrdf:PersonalName>

```

<http://id.loc.gov/authorities/names/n50039868>

Name entity in Wikidata

Charles Greeley Abbot (Q210126)

American astrophysicist and the 5th Secretary of the Smithsonian
C. G. (Charles Greeley) Abbot | C. G. Abbot

Enter a schema to check **Check** Automatically check schema

► Recoin: Most relevant properties which are absent

▼ In more languages

Language	Label	Description	Also known as
English	Charles Greeley Abbot	American astrophysicist and the 5th Secretary of the Smithsonian	C. G. (Charles Greeley) A... C. G. Abbot
Spanish	Charles Greeley Abbot	No description defined	

All entered languages

Statements

instance of **human** **edit**

► 2 references

+ add value

notable work **Man from the farthest past** **edit**

► 0 references + add reference

Great inventions

► 0 references + add reference

archives at **Smithsonian Institution Archives** **edit**

► 1 reference + add value

position held **Secretary of the Smithsonian** **edit**

start time 1928
end time 1944
series ordinal 5

► 1 reference + add value

<http://wikidata.org/entity/Q210126>

Work and person in Wikidata

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Man from the farthest past (Q51421898)

[New York, Smithsonian Institution series, inc.] 1930. | Patrons edition. Smithsonian Libraries

[View Book](#)

Other properties

title	Man from the farthest past [en]
part of the series	Smithsonian Scientific Series a twelve volume collection set on the history and activities of the Smithsonian Institution (1929-1949) series ordinal : 7
instance of	publication content made available to the general public
author	Charles Greeley Abbot American astrophysicist and the 5th Secretary of the Smithsonian stated as : Abbot, C. G. (Charles Greeley), 1872-1973 Aleš Hrdlička Czech-American anthropologist stated as : Hrdlicka, Ales, 1869-1943 Carl Whiting Bishop American archeologist stated as : Bishop, Carl Whiting, 1881-1942
publication date	1930
full work available at URL	https://library.si.edu/digital-library/book/manfromfarthestp07bish

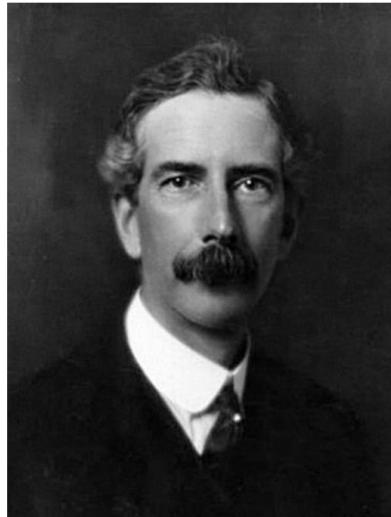
Charles Greeley Abbot

Q210126

American astrophysicist and the 5th Secretary of the Smithsonian

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

Charles Greeley Abbot (May 31, 1872 – December 17, 1973) was an American astrophysicist and the fifth secretary of the Smithsonian Institution, serving from 1928 until 1944. Abbot went from being director of the Smithsonian Astrophysical Observatory, to becoming Assistant Secretary, and then Secretary of the Smithsonian Institution over the course of his career. As an astrophysicist, he researched the solar constant, research that led him to invent the solar cooker, solar boiler, solar still, and other patented solar energy inventions.



[1/2]

instance of human

given name Charles
series ordinal 1

family name Abbott

name in native language Charles Greeley Abbot [English]

sex or gender male

country of citizenship United States of America

residence Washington, D.C.

date of birth May 31, 1872

place of birth Wilton

date of death December 17, 1973

References

American National Biography ID	1302322
BAnQ author ID	ncf10783586
BHL creator ID	12901 named as Abbot, C. G. (C. G. Abbot)
204481	
Bibliothèque nationale de France ID	112334332
Biographical Encyclopedia of Astronomers ID	4

Wikidata basics

Item – property - value

Q numbers – item

- Can be created by anyone
- Can correspond to an object or concept
- Examples:
 - Q1 – universe
 - Q2 – earth
 - Q5 – human
 - Q7377 – mammal
 - Q16983719 – Pratt Institute School of Information

P numbers – property

- Controlled vocabulary
- Created by community through consensus
- Examples:
 - P31 – instance of
 - P279 – subclass of
 - P21 – sex or gender
 - P214 – VIAF ID
 - P265 – coordinate location



Tools and APIs

Wikidata tools

- ▶ Mix'n'Match
- ▶ Cradle
- ▶ Scholia (& AuthorDisambiguator)
- ▶ Listeria
- ▶ TABernacle
- ▶ InteGraality
- ▶ QuickStatements
- OpenRefine
- Wikipedia/Wikidata Google spreadsheet (browser add-on)
- Entity explosion (browser add-on)
- User widgets

<http://wikidata.org/wiki/Wikidata:Tools>

Wikidata “Mix-n-Match”

59

https://mix-n-match.toolforge.org/#/catalog/4640

Mix'n'match English Welcome, ShiehJ Search

Smithsonian Art & Artist Files Collection (AAPG)

Names of artists that have artist files at the Smithsonian American Art and Portrait Gallery Library

Imported by user Aceven | Refresh

Entries

Category	Total	Percentage
Fully matched	8554	17.7%
Preliminarily matched	24428	50%
No Wikidata	0	0%
Not applicable to Wikidata	0	0%
Unmatched	15319	31.7%
Total	48301	

Fully matched
Preliminarily matched
Unmatched
Multiple match
No Wikidata
Not applicable
Import or update
Site stats
[Download](#)
[Match mode](#)
Recent Changes
Aliases
Jobs
Search only in
[Names in other databases](#)
Issues in this catalog
[Mobile matching](#)
[Visual tool](#)
[Catalog report](#)

<http://mix-n-match.toolforge.org/#/catalog/4640>

mix-n-match.toolforge.org/#/

This tool can list entries of some external databases, and allows users to match them against Wikidata items. Think 'red link lists on steroids'. See [the manual](#) or [watch a video](#) for a how-to. For an alternative, see [OpenRefine](#). You can [suggest](#), [import](#), or [scrape](#) new catalogs. See also: [AC properties without Mix'n'match](#).

Catalog groups

Group	Catalogs
	8
Cinema	49
Genealogy	12
Music	11
Software	15
Wolfram Language entity	85
Archives	28
Art	126
Authority control	6

Search catalogs

Start typing here

Latest catalogs

- [AllGame genres](#) video games genres in the AllGame database
- [AllGame platforms](#) video game platforms in the AllGame database
- [gamegear.jp](#) video games in the gamegear.jp database
- [IRIS SSSUP authors](#) identifier for an author in IRIS SSSUP, the open-repository of Sant'Anna Advanced Studies
- [IRIS Unipi authors](#) identifier for an author in ARPI, the open-repository of the University of Parma
- [Frick Art Reference Library Sitters File \(Married Name Clean-Up Project\)](#)
- [Smithsonian Art & Artist Files Collection \(AAPG\)](#) Names of artists that have artist files at the Smithsonian American Art and Portrait Gallery Library
- [Nintendo64EVER](#) video games in the Nintendo64EVER database database of Nintendo 64
- [N64-database](#) video games in the N64-database database of Nintendo 64 video games
- [SBN authors](#) identifier issued by National Library Service (SBN) of Italy

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Wikidata “Cradle”

Tool to create new
Wikidata items from a form

<http://cradle.toolforge.org/#/subject/artist>

https://cradle.toolforge.org/#/subject/artist_(in_library_collection,_short_description)

artist (in library collection, short description)

Labels*	Language Text	+
Aliases	Language Text	+
Descriptions	Language Text	+
instance of *	human	+
image	commonsMedia	+
sex or gender	female	+
country of citizenship	<input type="text"/>	+
name in native language	lan _i monolingualtext	+
date of birth	time	+
date of death	time	+
occupation	visual artist	+
movement	<input type="text"/>	+

Dolores Piperno (Q5289551)

Dolores Piperno is an American archaeologist specializing in archaeobotany. She is a senior scientist emeritus of the Smithsonian Tropical Research Institute in Balboa, Panama and the Smithsonian National Museum of Natural History, Washington. ([Read more on English Wikipedia](#))

 <https://orcid.org/0000-0002-0584-3133>

Table of Contents

- [List of publications](#)
 - [Number of publications per year](#)
 - [Number of pages per year](#)
- [Topics](#)
 - [Topic scores](#)
 - [Topics of authored works](#)
 - [Topics-works matrix](#)
- [Venue statistics](#)
- [Review statistics](#)
- [Co-author graph](#)
- [Co-author map](#)
- [Other locations](#)
- [Timeline](#)
- [Academic tree](#)
- [Citation statistics](#)
 - [Most cited works](#)
 - [Citations by year](#)
 - [Citing authors](#)
- [Associated images](#)
- [Events](#)

<http://scholia.toolforge.org/author/Q5289551>

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NATURAL
HISTORY

Dolores Piperno

Senior Scientist Emerita

<http://naturalhistory.si.edu/staff/dolores-piperno>



Department / Division

[Anthropology](#)

Research Interests

The archaeobotany, archaeology, and human ecology of the lowland American tropics together with the biogeographical and climatological history of the tropical biome. A main focus of my career is the origins of agriculture through investigations of phytoliths, starch

Listeria

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Tool to generate wiki tables
from SPARQL queries and
keep data synchronized with
Wikidata repository

<http://wikidata.org/wiki/WD:Listeria>

Generating List: Chinese emperors								
name	image	description	date of birth	date of death	occupation	country of citizenship	item	
Zhuanyu		Emperor of China	No/unknown value -26th century	No/unknown value -25th century				Q198180
Daughter of Emperor Xiaoming of Northern Wei		Northern Wei empress	0528-02-12	No/unknown value	politician			Q10889741
Emperor Ping of Han		emperor of the Han Dynasty	-0009	0006-02-03	monarch	Western Han		Q7244
Wang Mang		Han dynasty official and founding Emperor of the Xin Dynasty (c.45 BC-23 AD)	-0045	0023-10-06	sovereign	Han dynasty Xin dynasty		Q7250

wikidata.org/wikidata/Wikidata:WikiProject_PCC_Wikidata_Pilot/Smithsonian_Libraries/Projects/Chinese_Portraits/Tasks/Listeria

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TABernacle

Tool for browsing and editing Wikidata, a sister project of Wikipedia, that aids users in data entry and data remixing

<http://wikidata.org/wiki/Wikidata:TABernacle>

#	Item	instance of	Label	Description	Alias(es)
1	Emperor Zhi Q1207922	human	en Emperor Zhi	en	en *en
2	King Yi of Zhou Q1208109	human	en King Yi of Zhou	en King of China	en
3	King Yi of Zhou Q1208124	human	en King Yi of Zhou	en King of Zhou Dynasty	en
4	Fuchai Q1269349	human	en Fuchai	en Chinese king	en King Fuchai of Wu en Fucha
5	Fu Liang Q1270073	human	en Fu Liang	en Chinese official (374-426)	en
6	Liang Shidu Q1272181	human	en Liang Shidu	en Chinese general	en
7	Emperor Taizu of Later Liang Q1275305	human ► References/qualifiers	en Emperor Taizu of Later Liang	en Liang Dynasty emperor	en Zhu Huang en Zhu Quanzhong
8	King Zhao of Zhou Q1275781	human ► References/qualifiers	en King Zhao of Zhou	en King of the Chinese Zhou Dynasty	en Zhou Zhaowang
9	Emperor Xuan of Western Liang Q1285740	human ► References/qualifiers	en Emperor Xuan of Western Liang	en Western Liang emperor	en Xiao Qie en Xiao Cha en Lisun en Zhong Zong en Xuan Di en Xiao Cha(Liangxuanhuangdi)

<https://tinyurl.com/slaChineseEmperors>

Wikidata “InteGraality”

[Wikidata:GLAM/Smithsonian Institution/Reports/SAAM/tabs](#) This table describes the completeness of properties in Wikidata for SAAM objects. A good reference for item structure for visual works: [Wikidata:WikiProject_Visual_arts/Item_structure](#).

[all entities](#) | [count](#) | [all groupings](#) | [without grouping property](#) | [below threshold \(1\)](#) | Grouping by [instance of \(P31\)](#)

Manually update

Top groupings (Minimum 1 items)		Top Properties (used at least 0 times per grouping)									
Name	Count	image (P18)	inception (P571)	height (P2048)	width (P2049)	creator (P170)	copyright status (P6216)	inventory number (P217)	described at URL (P973)		
painting (Q3305213)	8405	43.36% (3644)	92.31% (7759)	89.32% (7507)	89.32% (7507)	99.89% (8396)	42.42% (3565)	100.0% (8405)	0.25% (21)		
watercolor painting (Q18761202)	392	65.82% (258)	98.47% (386)	99.49% (390)	99.49% (390)	100.0% (392)	100.0% (392)	100.0% (392)	0% (0)		
print (Q11060274)	6	16.67% (1)	100.0% (6)	50.0% (3)	50.0% (3)	100.0% (6)	0% (0)	100.0% (6)	0% (0)		
sculpture (Q860861)	4	100.0% (4)	100.0% (4)	50.0% (2)	25.0% (1)	100.0% (4)	0% (0)	75.0% (3)	0% (0)		

wikidata.org/wiki/Wikidata:GLAM/Smithsonian_Institution/Reports/SAAM/Object_ID_completeness

QuickStatements

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Tool to edit Wikidata items, based on a simple set of text commands:

V1

CSV

<http://quickstatements.toolforge.org/#/>

This is a new interface for QuickStatements V2. Just in case, the old interface is [here](#).

Create new command batch for **Wikidata** as batch name

CREATE

```
LAST Len "Alfred Leslie"
LAST Den "American artist known for figurative artworks"
LAST P31 Q5
LAST P21 Q6581097
LAST P569 +1927-10-29T00:00:00Z/11 S854 "http://www.artnet.com/artists/alfred-leslie/" S813
+2020-09-01T00:00:00Z/11
LAST P19 Q18426
LAST P20 Q7565985
LAST P6379 Q1192305
LAST P1795 "2894"
CREATE
LAST Len "Allan Janus"
```

QuickStatements English New batch Last batches Chat Git Help

Create new command batch for **SI Wikibase** as batch name

```
qid,Len,Den,P17,P208,P65,P135
,"Louis Pasteur","French chemist and microbiologist","","Q529","",Q18,Q138,Q71
,"Nicolaus Copernicus","Renaissance-era mathematician, astronomer, and clergyman who formulated the heliocentric model of the Universe","","Q529","",Q18,Q138,Q71
,"André-Marie Ampère","French physicist and mathematician","","Q529","",Q18,Q138,Q71
,"Alessandro Volta","Italian physicist, chemist, and pioneer of electricity and power","","Q529","",Q18,Q138,Q71
,"Aristotle","ancient Greek philosopher","","Q529","",Q18,Q138,Q71
,"Isaac Newton","British physicist and mathematician","","Q529","",Q18,Q138,Q71
```

OpenRefine

<http://openrefine.org>

The screenshot shows the OpenRefine interface with a search results table. The search term "chemical elem" is entered in the search bar. The results list 23 chemical elements, each with a star icon, a small blue icon, a rank number, the element name, and a "Choose new match" link.

All	chemical elem
1.	hydrogen Choose new match
2.	helium Choose new match
3.	lithium Choose new match
4.	beryllium Choose new match
5.	boron Choose new match
6.	carbon Choose new match
7.	nitrogen Choose new match
8.	oxygen Choose new match
9.	fluorine Choose new match
10.	neon Choose new match
11.	sodium Choose new match
12.	magnesium Choose new match
13.	aluminum Choose new match
14.	silicon Choose new match
15.	francium Choose new match
16.	phosphorus Choose new match
17.	iron Choose new match
18.	sulfur Choose new match
19.	chlorine Choose new match
20.	argon Choose new match
21.	potassium Choose new match
22.	calcium Choose new match
23.	lead Choose new match

<https://www.wikidata.org/wiki/Wikidata:Tools/OpenRefine>



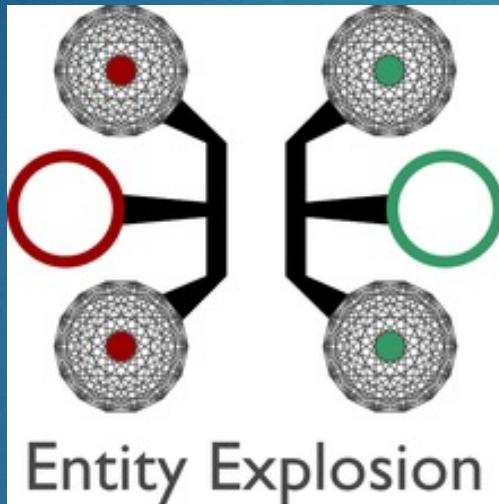
Browser extensions

Browser extension: Wikipedia/Wikidata Tools

The screenshot shows a spreadsheet application interface with a menu bar (File, Edit, View, Insert, Format, Data, Tools) and a toolbar above the spreadsheet area. The spreadsheet has two columns: A (DisplayName) and B (Description). Row 1 contains "Len" and "Den". The "Tools" menu is open, showing various options like Add-ons, Macros, Apps Script, AppSheet, MatchMARC, and Wikipedia and Wikidata Tools. A green arrow points from the text "Wikipedia and Wikidata Tools" in the menu to a list of tools on the right.

✓ WIKIARTICLESAROUND
WIKICATEGORIES
WIKICATEGORYMEMBERS
WIKICOMMONSSLINK
WIKIDATADESCRIPTIONS
WIKIDATAFACTS
WIKIDATALABELS
WIKIDATALOOKUP
WIKIDATAQID
WIKIDATASEARCH
WIKIEXPAND
WIKIGEOCOORDINATES
WIKIINBOUNDLINKS
WIKILINKSEARCH
WIKIMUTUALLINKS
WIKIOUTBOUNDLINKS
WIKIPAGEEDITS
WIKIPAGEVIEWS
WIKIQUARRY
WIKISEARCH

Browser extension: Entity Explosion



https://open.spotify.com/artist/0Sadg1vgvaPqGTOjxu0N6c

lengua
[es] español

entidad
Girls' Generation (Q20153)

Popular

1 Gee

2 Lion H

3 Into th

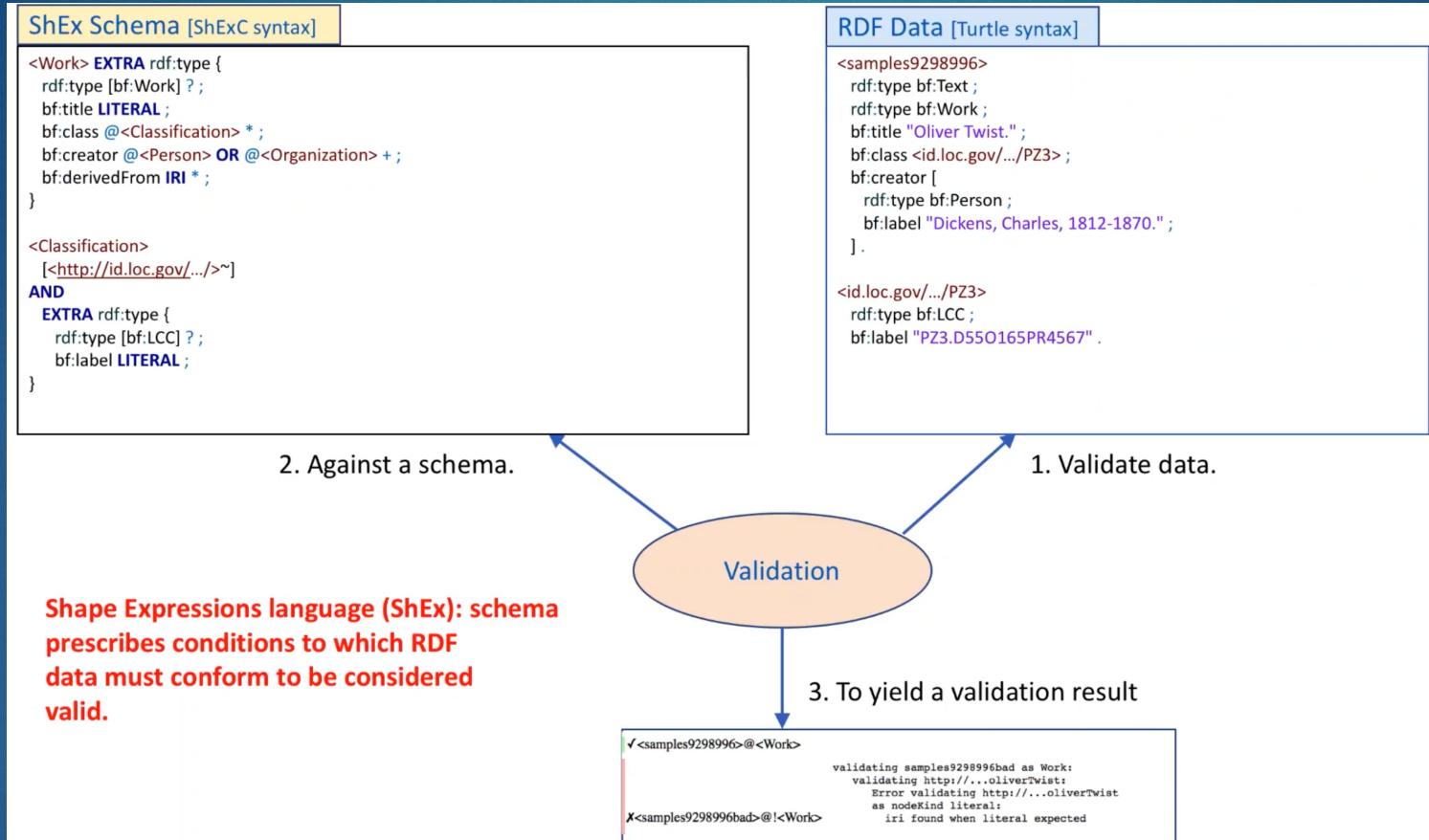
4 Mr.Mr.

Wikidata: Q20153
Wikimedia Commons: Girls' Generation
Wikipedia: Girls' Generation
categoría de miembros: Categoría:Miembros de Girls' Generation
categoría principal del tema: Categoría:Girls' Generation
compuesto por: Taeyeon
compuesto por: Sooyoung
compuesto por: Sunny
compuesto por: Jessica Jung
compuesto por: Tiffany Young
compuesto por: Seohyun
compuesto por: Hyoyeon
compuesto por: Kwon Yuri
compuesto por: Yoona

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Data quality assurance

Schemas (via Shape Expression)



https://www.wikidata.org/wiki/Wikidata:WikiProject_Schemas
<http://shex.io/>



Data reuse

presenting Wikidata knowledge

Data representations

- ▶ As graphs

<https://w.wiki/4LTg>

- ▶ In map

<https://w.wiki/42WB>

- ▶ Tabular form

<https://w.wiki/3Kem>

- ▶ Tree view

<https://tinyurl.com/2o56ga3u>

Wikidata display options

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Wikidata Search Wikidata    

Navigation ▾ Wiki tools ▾ Page tools ▾

Charles Greeley Abbot (Q210126)

  EditSUM

[Item](#) [Discussion](#) [Star](#) [History](#) [edit](#) [←](#)

American astrophysicist and the 5th Secretary of the Smithsonian

C. G. (Charles Greeley) Abbot | C. G. Abbot

Enter a schema to check [Check](#) Automatically check schema

► [Recoin: Most relevant properties which are absent](#)

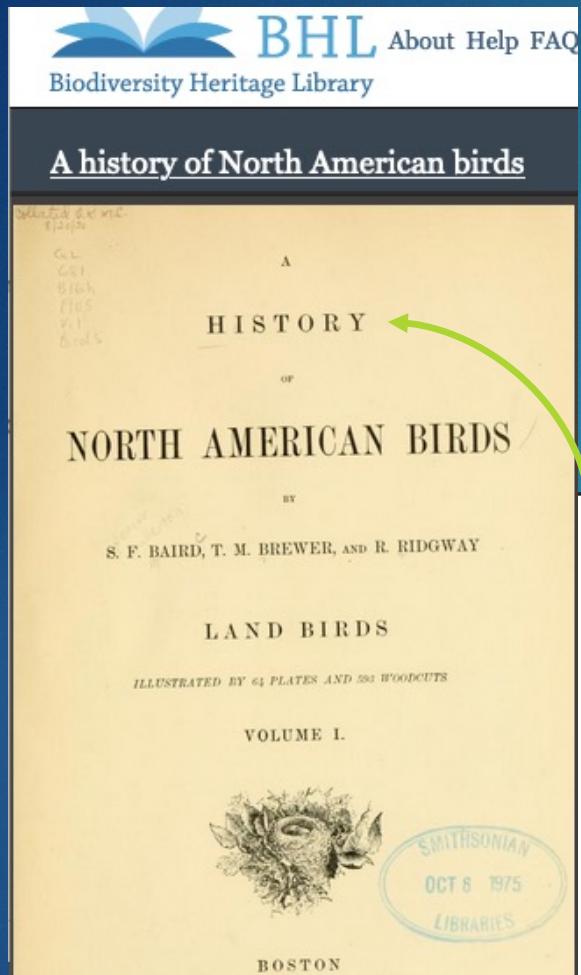
▼ In more languages

Language	Label	Description	Also known as
English	Charles Greeley Abbot	American astrophysicist and the 5th Secretary of the Smithsonian	C. G. (Charles Greeley) A... C. G. Abbot
Spanish	Charles Greeley Abbot	No description defined	

 Reasonator

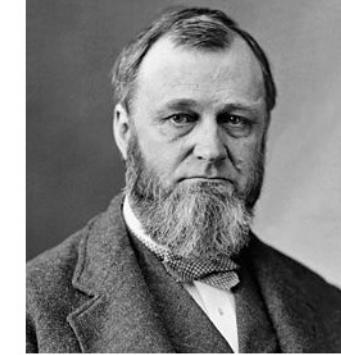
Statements	
Own statements	
writing language	English (West Germanic language originating in England)
place of death	Washington, D.C. (capital city of the United States)
languages spoken, written or signed	English (West Germanic language originating in England)

A black and white portrait of Charles Greeley Abbot, an American astrophysicist and the 5th Secretary of the Smithsonian. He is shown from the chest up, wearing a dark suit, a white shirt, and a tie. He has a prominent mustache and is looking slightly to the right of the camera.



Spencer Baird inter- & intra- links: author to work

educated at	Dickinson College college in Pennsylvania
family name	Baird family name
given name	Spencer unisex given name series ordinal : 1
Fullerton	given name series ordinal : 2
notable work	A history of North American birds Natural History Illustrations 1889 b The water birds of North America Outlines of American ornithology Book Report upon the invertebrate animal life and physical features of the region sci Catalogue of North American birds, chiefly in the Museum of the Smithsonian Institution Washington :Smithsonian Institution,1858. Smithsonian Libraries View Book
	View Book in Libraries View Book 1874] Smithsonian Libraries View with an account of the



Spencer Fullerton Baird (Q14049)

Spencer Baird | Baird | Spencer F. Baird | Baird, SF | Спенсер Бэрд | スペンサー・フラートン・ペアード | Спенсер Фуллертон Бэрд | 斯賓塞·富勒頓·貝爾德 | سپنسر فولرتون بیرد | Spencer Fullerton Baird | ספנסר פולרטון בAIRד

American naturalist, ornithologist, ichthyologist, museum curator, and the 2nd Secretary of the Smithsonian

Spencer Fullerton Baird was a US-American naturalist, curator, ornithologist, zoologist, ichthyologist, and university teacher.

He was born on February 3, 1823 in Reading to Lydia McFunn Baird.

He studied at Dickinson College. His field of work included ornithology, ichthyology, and herpetology.

<http://reasonator.toolforge.org/?&q=51403552>

Wikipedia article with Wikidata



<http://wikipedia.org/wiki/WP:MBABEL>

Crotos

Language English Images/page 20 → Reading mode

smithsonian

Search

4354 Results

The screenshot shows a search results page for 'smithsonian'. At the top, there are language and image settings (English, 20 images per page, reading mode with icons for night, day, and sun). A search bar contains 'smithsonian' and a 'Search' button. Below, it says '4354 Results'. The results are displayed in four columns:

- Rooftops**
Alice Pike Barney - Smithsonian American Art Museum
- A View of Venice**
Thomas Moran - Smithsonian American Art Museum
- Edge of a Stream**
Eliphalet Frazer Andrews - Smithsonian American Art Museum
- James Smithson**
Henri-Joseph Johns - National Portrait Gallery

Each result row includes a small set of icons at the bottom right.

<http://zone47.com/crotos/?s=smithsonian>

WADE: Wiki Art Depiction Explorer

Two Comanche Girls (Q20441431)

Label from: English (en)

[view on Wikidata](#) [skip this photo](#) [browse paintings](#)

artist: George Catlin (Q455133)

collection: Smithsonian American Art Museum (Q1192305)

location: Smithsonian American Art Museum (Q1192305)

country of origin: United States of America (Q30)

material used: oil paint (Q296955) canvas (Q4259259)

Smithsonian American Art Museum ID: 4421

information from the Smithsonian American Art Museum catalog

description: The scene, painted by George Catlin at a Comanche village in 1834, shows "the wigwam of the Chief, his dogs, and his five children." The artist also described the village as "six or eight hundred skin-covered lodges, made of poles and buffalo skins, in the manner precisely as those of the Sioux and other Missouri tribes . . . This village with its thousands of wild inmates, with horses and dogs, and wild sports and domestic occupations, presents a most curious scene; and the manners and looks of the people, a rich subject for the brush and the pen." (Catlin, Letters and Notes, vol. 2, no. 42, 1841, reprint 1973, and 1848 Catalogue, Catlin's Indian Gallery, SAAM online exhibition)

keywords [Ethnic – Indian – Comanche](#) [Children](#) [Architecture Exterior – domestic – teepee](#)

what can you see in this painting?

<http://art.wikidata.link/item/Q20441431>



wikidata.org/wiki/Wikidata:WikiProject_Wiki_Art_Depiction_Explorer

Data visualization



The screenshot shows the homepage of the Wikidata Knowledge Grapher. At the top, there is a dark navigation bar with the text "Wikidata Knowledge Grapher", "Home", and "About". Below the navigation bar, the main content area has a white background. The title "Wikidata Knowledge Grapher" is displayed in a large, bold, dark font. Below the title, there is a descriptive text: "Create knowledge graphs in Wikidata Query by specifying Q numbers, one per line, with wd: prefix.".

<http://knowledgegrapher.toolforge.org>

Ex: [https://w.wiki/4U\\$o](https://w.wiki/4U$o) ; Ex: <https://w.wiki/4VFU>

Inventaire

← → ⌂ ⌂ https://inventaire.io/entity/wd:Q8265 ☆ 🐶 🎯 ⟲ ⟳ ⌄

inv Search English ▾

All Work Author Series Publisher Collection Subject

All User Group

photo credits: Wikimedia Commons

Dream of the Red Chamber

wd:Q8265

Dream of the Red Chamber, also called The Story of the Stone, or Hongloumeng (traditional Chinese: 紅樓夢; simplified Chinese: 红楼梦; pinyin: Hónglóumèng), composed by Cao Xueqin, is one of China's Four Great Classical Novels. It was written some time in the middle of the 18th ...

English (100%)
Deutsch (99%)
Français (95%)
Svenska (95%)
Italiano (91%)
Bahasa Indonesia (86%)
Español (82%)
العربية (78%)
Nederlands (71%)
Dansk (69%)
Русский (67%)
Türkçe (65%)

<http://inventaire.io/entity/wd:Q8265>

Histropedia

Secretaries of the Smithsonian Institution

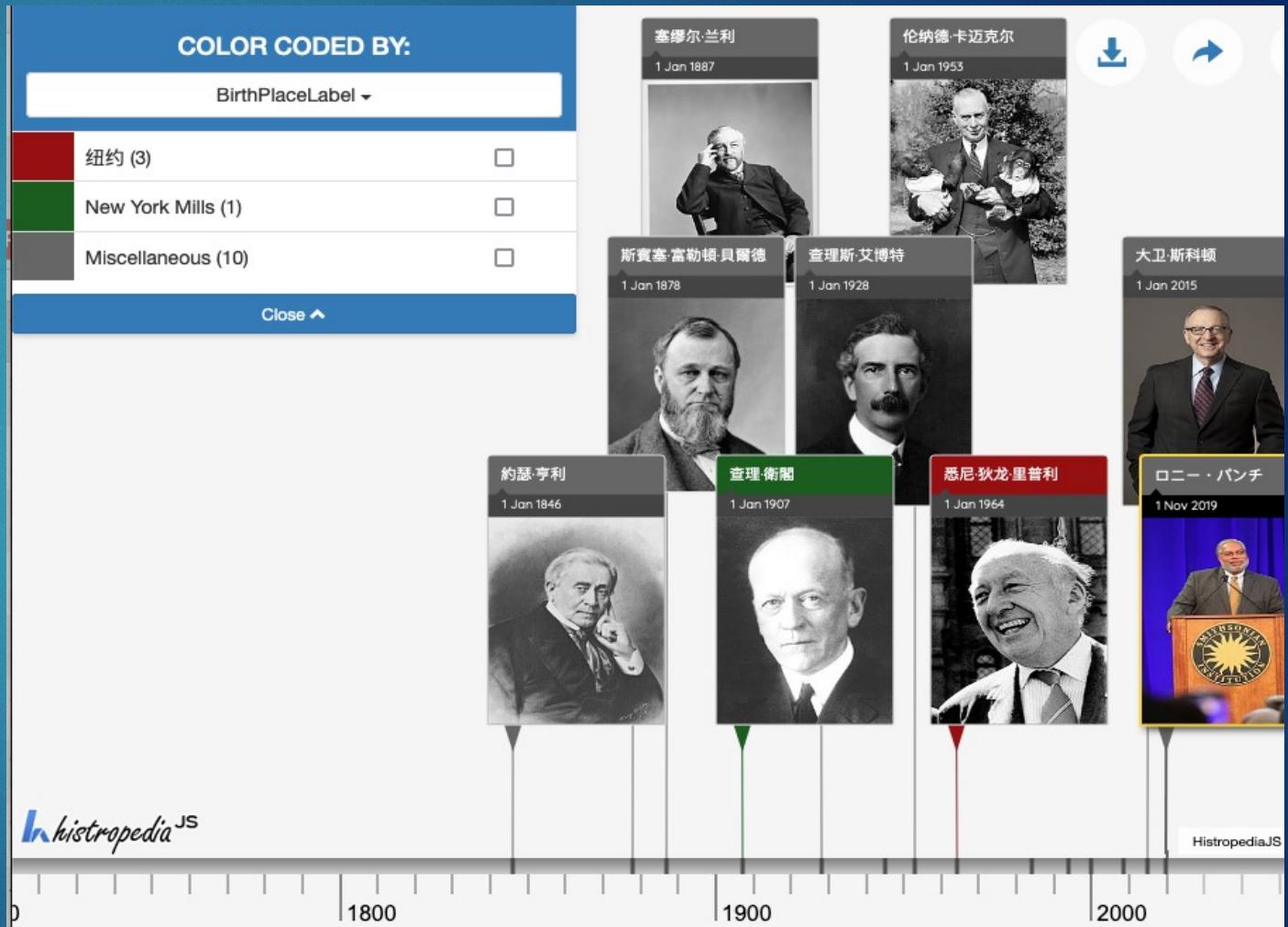
<https://w.wiki/3wmq>

Data representation via Histropedia

<http://tinyurl.com/SIsecretaries>

<http://tinyurl.com/SIsecretariesBydates>

<http://tinyurl.com/SIsecretariesLang>



Wikidata “Dashboard”: CoVid-19

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COVIWD

COVIWD: COVID-19 WIKIDATA DASHBOARD

COVID19

The [COVID-19 pandemic](#) is an ongoing pandemic of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The outbreak was first found in Wuhan, China, in December 2019, and was called a pandemic by the World Health Organization (WHO) on 11 March 2020. COVIWD (COVID-19 Wikidata Dashboard) provides a one-stop information/visualization service for COVID-19-related topics. The live data for this dashboard comes from [Wikidata](#), a free but quality, collaborative knowledge graph. The information presented here in this dashboard is not to be considered medical advice and is not intended to replace consultation with a qualified medical professional. A paper (in English) describing the data & query model and development of COVIWD is available at [this link](#). For any feedback, please feel free to contact [Fariz Darari](#).

<http://coviwd.org>

COVID19 Map



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Web services

- ▶ Library of Congress
- ▶ iNaturalist
- ▶ IMDB
- ▶ GeoName
- ▶ Spotify
- ▶ etc.
- ▶ Abbot, C.G. (Charles Greeley)
<http://id.loc.gov/authorities/names/n50039868>
- ▶ Yellow-legged Gull
<http://inaturalist.org/taxa/59202>
- ▶ James Norton
<http://imdb.com/name/nm3584268>
- ▶ Tokyo Prefecture
<http://geonames.org/1850144>
- ▶ Girls' Generation (Korean girl pop music group)
<http://open.spotify.com/artist/0Sadg1vgvaPqGTOjxu0N6c>

Embedded in Library catalog

- ▶ Smithsonian library BF catalog
- ▶ Cornell library New catalog
- ▶ Mich State library catalog
- ▶ U-W Madison library catalog
- ▶ C. G. Abbot
<https://smithsonian.svde.org/agents/881654265711649>
- ▶ “Two” (scroll to click <Highlight the DISCOGS data>)
<http://newcatalog.library.cornell.edu/catalog/8058246>
- ▶ “Comparison of ...” (scroll to click icon <i>) link for < Subjects >)
<http://d.lib.msu.edu/etd/3746/>
- ▶ “Mark Twain” (scroll to view <Information from the Web>)
<http://search.library.wisc.edu/catalog/9911042395202121>

Want more?

The possibility is ENDLESS...

Check out

<http://thinking.is.ed.ac.uk/wikidata-workshop/structured-linked-open-data/>

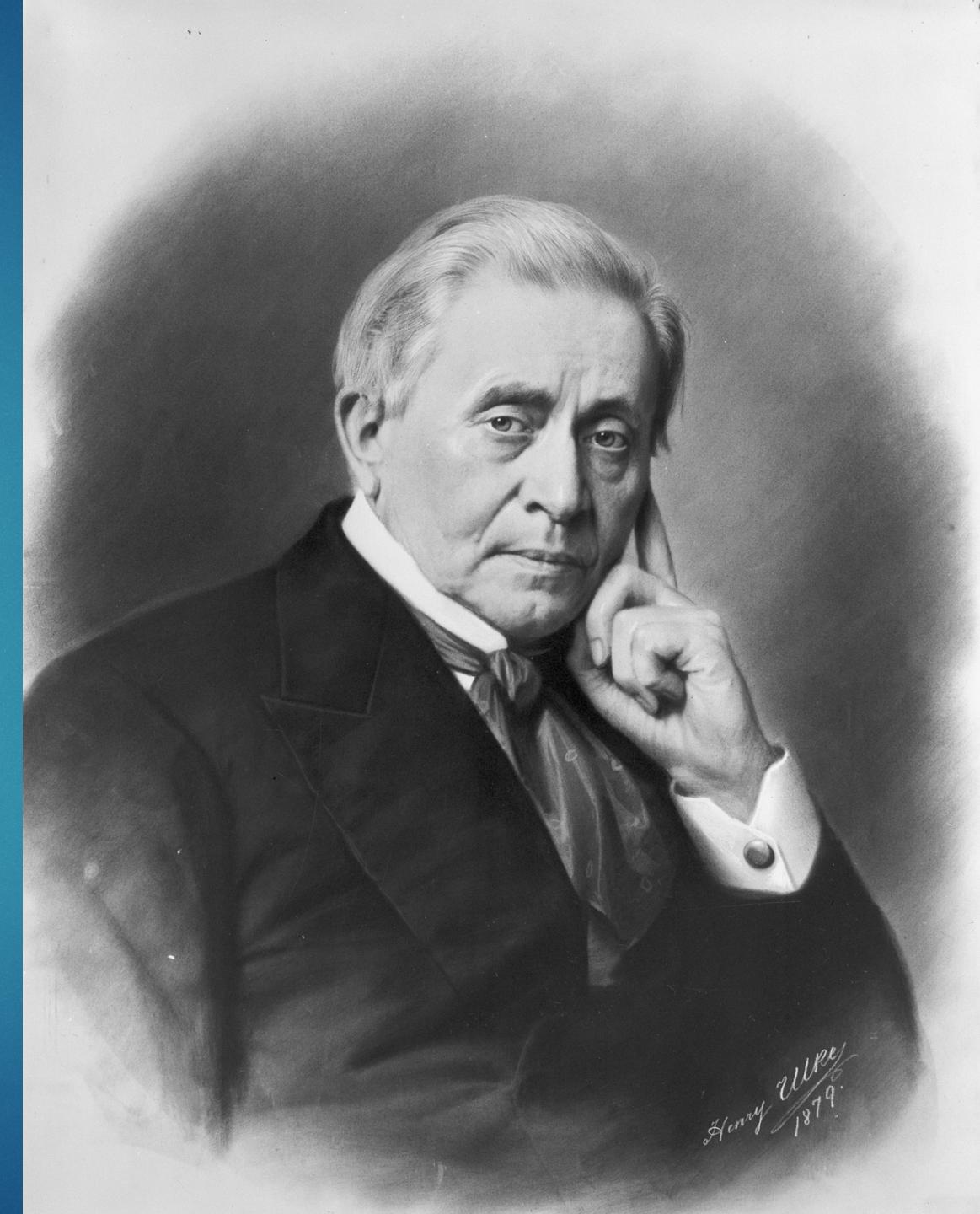
Your answer ...

- ▶ Why should you care?
- ▶ How will linked data relate to my work?
- ▶ How will linked data help describing collections
- ▶ How will linked data apply controlled vocabularies
- ▶ What can I do with linked data NOW?
- ▶ What tools or skills are available at my fingertips?

“The worth and importance of the Institution is not to be estimated by what it accumulates within the walls of its building, but by what it **sends forth** to the world.”

—Joseph Henry, 1852

First Secretary of the Smithsonian Institution (1846-1878)



Resources

- ▶ *Linked data implementations*

<http://oclc.org/content/dam/research/events/2018smith-yoshimura-Linked-data-implementations-who-what-why-SWIB18.pptx>

- ▶ *IFLA/LRM and RDA training*

<http://www.loc.gov/catworkshop/RDA2020/>

- ▶ *LD4PE : Exploring Linked data*

http://explore.dublincore.net/competency_index/d2695955/s2696018/s2696061/s2742457/

- ▶ *Next-generation metadata and the semantic continuum*

<http://hangingtogether.org/next-generation-metadata-and-the-semantic-continuum/>

- ▶ *Formulating and Obtaining URIs*

http://loc.gov/aba/pcc/bibframe/TaskGroups/formulate.obtain_URI_guide.pdf

- ▶ *URI FAQs: PCC URI Task Group on URIs in MARC*

https://loc.gov/aba/pcc/bibframe/TaskGroups/URI_FAQs.pdf

Conferences

► **DublinCore**

<https://www.dublincore.org/conferences/>

► **LD4 Community**

<https://ld4.io>

► **Semantic Web in Libraries**

<https://swib.org/swib22/>



BIBFRAME Workshop in Europe

<https://2022.bfwe.eu/>



<http://wikidatacon.org>



<https://openlibraryfoundation.org/about/wolfcon/>

Thank you!



<https://bit.ly/Pratt653LOD2022>