



CEDAR

an open source linked data editor



Nancy Lorimer
Stanford University (LD4P)
European BIBFRAME Workshop
Fiesole, 17 September 2018

Better data for better science



Stanford
MEDICINE



Oxford
e-Research
Centre



UNIVERSITY OF
OXFORD

Northrop Grumman



Yale SCHOOL OF MEDICINE

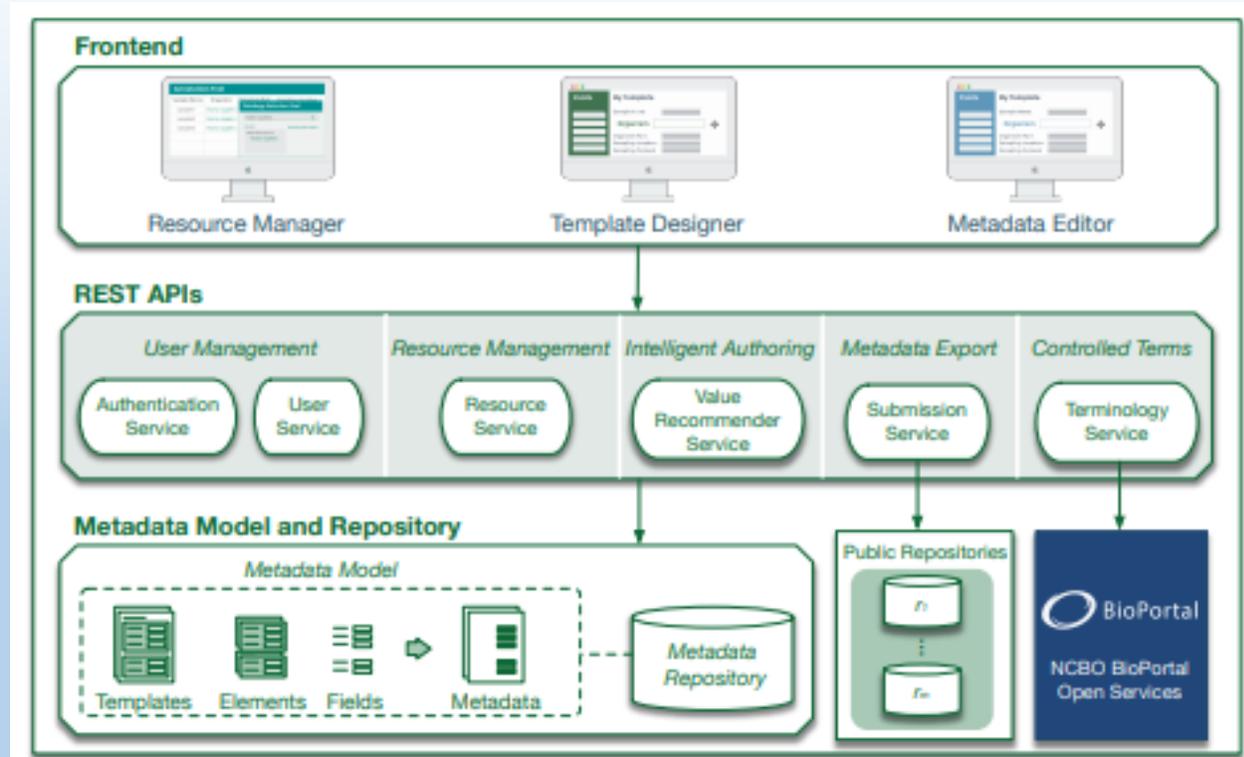
- project led by Stanford Medicine
- funded by the National Institutes for Health (NIH) through the Big Data to Knowledge Initiative
- goal is of “drastically improving the metadata that annotate datasets in public repositories”

The CEDAR Workbench

- suite of open-source, Web-based tools and APIs
- modular REST-based environment for authoring metadata enriched with terms from ontologies
 - allows users to:
 - construct metadata templates using pre-existing ontologies
 - fill in the templates to generate metadata
 - share and manage resources—ontologies, templates, data
 - make metadata available as JSON, JSON-LD or RDF
 - can leverage APIs for validating and submitting metadata to external repositories

CEDAR Workbench

- Create
- Update
- Validate
- Search
- Analyze
- Publish



- supports the entire metadata lifecycle

- Ontology Browser
- Search
- Annotator
- Mappings
- Recommender
- Resource Index

Welcome nlorimer.

Welcome to BioPortal, the world's most comprehensive repository of biomedical ontologies

Search for a class



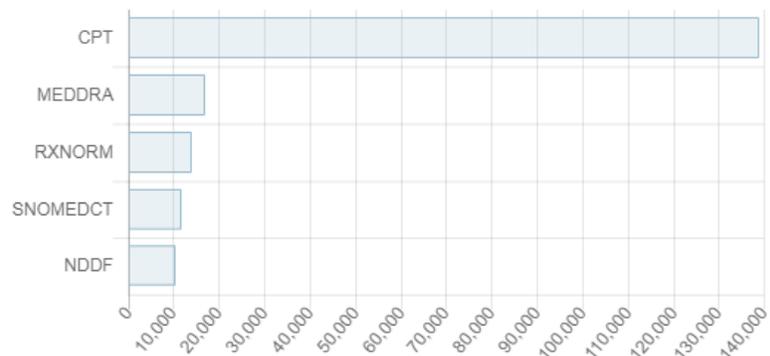
[Advanced Search](#)

Find an ontology



[Browse Ontologies](#)

Ontology Visits (August 2018)



[More](#)

BioPortal Statistics

Ontologies	732
Classes	9,576,635
Resources Indexed	0
Indexed Records	0
Direct Annotations	95,468,433,792
Direct Plus Expanded Annotations	144,789,582,932

Browse

Browse the library of ontologies [?](#)

Showing 732 of 887 **Sort:** Popular ▾

[Submit New Ontology](#)

Entry Type

- Ontology** (732)
- Ontology View** (155)

Uploaded in the Last

 ▾

Category

- All Organisms** (26)
- Anatomy** (71)
- Animal Development** (13)
- Animal Gross Anatomy** (2)
- Arabidopsis** (2)
- Biological Process** (45)
- Biomedical Resources** (69)

Group

- BIBLIO** (11)
- BIS** (3)
- CGIAR** (1)
- CTSA** (6)
- OBO_Foundry** (11)
- PSI** (4)
- UMLS** (31)

Current Procedural Terminology (CPT)

Current Procedural Terminology

Uploaded: 7/6/18

projects
1

classes
13,996

Medical Dictionary for Regulatory Activities (MEDDRA)

Medical Dictionary for Regulatory Activities Terminology (MedDRA)

Uploaded: 7/6/18

notes
1

projects
10

classes
71,208

RxNORM (RXNORM)

RxNorm Vocabulary

Uploaded: 7/6/18

projects
7

classes
113,617

SNOMED CT (SNOMEDCT)

SNOMED Clinical Terms

Uploaded: 7/6/18

notes
3

projects
23

classes
347,358

National Drug Data File (NDDF)

National Drug Data File Plus Source Vocabulary

Uploaded: 7/6/18

projects
1

classes
28,974

Foundational Model of Anatomy (FMA)

projects
17

classes
104,523

Browse

Browse the library of ontologies 

Showing 11 of 887 **Sort:** Popular 

[Submit New Ontology](#)

Entry Type

- Ontology** (11)
- Ontology View** (0)

Uploaded in the Last

Category

- All Organisms (0)
- Anatomy (0)
- Animal Development (0)
- Animal Gross Anatomy (0)
- Arabidopsis (0)
- Biological Process (0)
- Biomedical Resources (0)

Group

- BIBLIO** (11)
- BIS (3)
- CGIAR (1)
- CTSA (6)
- OBO_Foundry (11)
- PSI (4)
- UMLS (31)



VIVO Ontology for Researcher Discovery (VIVO)

The VIVO ontology represents researchers in the context of their experience, outputs, interests, accomplishments, and associated institutions.

Uploaded: 7/17/18

projects
2

classes
418

Dublin Core (DC)

The Dublin Core Schema is a small set of vocabulary terms that can be used to describe several kinds of resources

Uploaded: 2/17/17

classes
11

Web Annotation Ontology (OA)

The Web Annotation Data Model specification describes a structured model and format to enable annotations to be shared and reused across different hardware and software platforms

Uploaded: 7/18/17

classes
25

BIBFRAME 2.0 (BIBFRAME)

Initiated by the Library of Congress, BIBFRAME provides a foundation for the future of bibliographic description, both on the web, and in the broader networked world

Uploaded: 6/8/17

projects
1

classes
188

Library of Congress Genre/Form Thesaurus for Library and Archival Materials (LCGFT)

The Library of Congress Genre/Form Terms for Library and Archival Materials (LCGFT) is a thesaurus that describes what a work is versus what it is about

Uploaded: 9/6/17

concepts
2,181

BIBFRAME 2.0

[Summary](#)
[Classes](#)
[Properties](#)
[Notes](#)
[Mappings](#)
[Widgets](#)
[Edit ontology information](#)
[Add submission](#)
[Edit submission information \(2017-05-04T14:49:12.796-04:00\)](#)

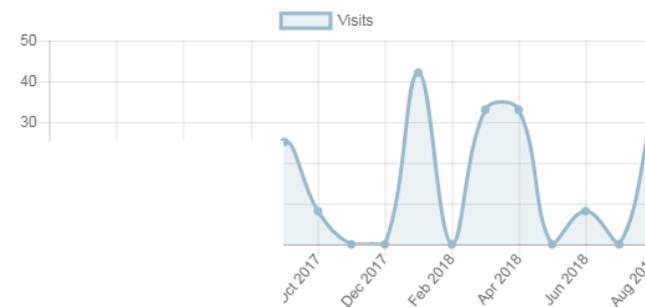
Details

ACRONYM	BIBFRAME
VISIBILITY	Public
BIOPORTAL PURL	http://purl.bioontology.org/ontology/BIBFRAME
DESCRIPTION	Initiated by the Library of Congress, BIBFRAME provides a foundation for the future of bibliographic description, both on the web, and in the broader networked world. In addition to being a replacement for MARC, BIBFRAME serves as a general model for expressing and connecting bibliographic data. A major focus of the initiative will be to determine a transition path for the MARC 21 formats while preserving a robust data exchange that has supported resource sharing and cataloging cost savings in recent decades.
STATUS	Production
FORMAT	OWL
CONTACT	John Graybeal, jgraybeal@stanford.edu
HOME PAGE	https://www.loc.gov/bibframe/
PUBLICATIONS PAGE	
DOCUMENTATION PAGE	https://www.loc.gov/bibframe/docs/index.html
CATEGORIES	Other, Upper Level Ontology
GROUPS	Bibliographic Materials Group

Metrics

NUMBER OF CLASSES:	188
NUMBER OF INDIVIDUALS:	0
NUMBER OF PROPERTIES:	195
MAXIMUM DEPTH:	2
MAXIMUM NUMBER OF CHILDREN:	75
AVERAGE NUMBER OF CHILDREN:	9
CLASSES WITH A SINGLE CHILD:	3
CLASSES WITH MORE THAN 25 CHILDREN:	2
CLASSES WITH NO DEFINITION:	2

Visits [Download as CSV](#)



Projects Using This Ontology [Create new project](#)

PROJECT	DESCRIPTION	PEOPLE	INSTITUTION
Performed Music Ontology	Part of the Linked Data for Production grant, a BIBFRAME extension ontology for performed music.		Stanford

BIBFRAME 2.0

Summary Classes Properties Notes Mappings Widgets Edit ontology information Add submission

Jump To:

- Acquisition source
- Administrative metadata
- Agent
- Applied material
- Aspect ratio
- Base material
- Book format
- Capture of content
- Carrier type
- Cartographic information
- Classification entity
- Collection
- Color content
- Content accessibility information
- Content type
- Contribution
- Copyright registration
- Cover art
- Digital characteristic
 - Digital cartographic data type
 - Digital cartographic object count
 - Digital cartographic object type
 - Encoded bitrate
 - Encoding format
 - File size
 - File type
 - Regional encoding
 - Resolution
- Dissertation information
- Emulsion
- Enumeration and chronology
- Event entity
- Extent
- Font size
- Frequency
- Generation
- Genre/form
- Geographic coverage
- Identifier
- Illustrative content
- Immediate acquisition
- Instance

Details Visualization Notes (0) Class Mappings (2)

Preferred Name	Acquisition source
Definitions	Information about an organization, person, etc., from which a resource may be obtained.
ID	http://id.loc.gov/ontologies/bibframe/AcquisitionSource
definition	Information about an organization, person, etc., from which a resource may be obtained.
label	Acquisition source
modified	2017-02-06 (New)
prefixIRI	bf:AcquisitionSource
prefLabel	Acquisition source
subClassOf	http://www.w3.org/2002/07/owl#Thing

BIBFRAME 2.0

Summary Classes Properties Notes Mappings Widgets Edit ontology information Add submission

- Administrative metadata
- Applied material
- Arrangement of material
- Aspect ratio
- Assigner
- Associated agent
- Award note
- Base material
- Book format
- Capture of content
- Carrier type
- Cartographic ascension and declination
- Cartographic coordinates
- Cartographic data
- Cartographic equinox
- Cartographic G ring area excluded
- Cartographic outer G ring area covered
- Cartographic projection
- Classification
- Classification designation
- Classification item number
- Classification number
- Classification number span end
- Classification scheme edition
- Classification table identification
- Classification table sequence number
- Code
- Color content
- Content accessibility information
- Content nature
- Content type
- Contributor and role

Property Details

Labels

Capture of content

Definitions

Information about place and date associated with the capture (e.g., recording, filming) of the content of a resource.,Used with Work or Instance

ID

<http://id.loc.gov/ontologies/bibframe/capture>

New +

- Folder
- Field
- Element
- Template

FILTER

RESET ALL

TYPE



VERSION

All / Users / Nancy Lorimer / BIBFRAME template



Title	Created	Modified	
 Bibframe Instance	9/4/18	9:19 PM	
 BIBFRAME Work	4:37 PM	9:16 PM	
 Instance Title Element	9/6/18	4:23 PM	
 Variant Title Element	9/6/18	9/6/18	

Displaying 1 - 4 of 4

Template Name

BiBFRAME Instance

Template Description



CANCEL

SAVE TEMPLATE

{ } JSON Schema



Find a term in BioPortal or [Create a New Term](#)

Search in BioPortal

instance

[Start Over](#)



494 results for the query 'instance'. Click on a term below to select it

TERM	DEFINITION	TYPE	SOURCE	ID
Instance	An occurrence of something.	Class	NCIT	C48364
Instance	Resource reflecting an individual, material embodiment of a Work.	Class	BIBFRAME	instance
Instance	-	Class	BIBLIOTEK-O	Instance
Instance	Resource reflecting an individual, material embodiment of a Work.	Class	BFLC	Instance
Instance relation	Taxonomic anatomical relation which asserts the instantiation of a type by two or more instances (individuals).	Class	FMA	fma264215

Template Name
BiBFRAME Instance

 JSON Schema



LINK



PAGE BREAK



PARAGRAPH



SECTION BREAK



MULTIPLE CHOICE



RICH TEXT



CHECKBOX



IMAGE



PICK FROM A LIST



YOUTUBE



PHONE



ATTRIBUTE VALUE



Template Name

BiBFRAME Instance

Template Description



+ A ✎

Enter Field Name
Edition statement

Enter Field Help Text
Help Text

OPTIONS VALUES MULTIPLE REQUIRED SUGGESTIONS HIDDEN

- A
- 📅
- ✉
- #
- ⋮
- 🔍

CLEAR

CANCEL

SAVE TEMPLATE

Template Name

BIBFRAME instance

Template Description

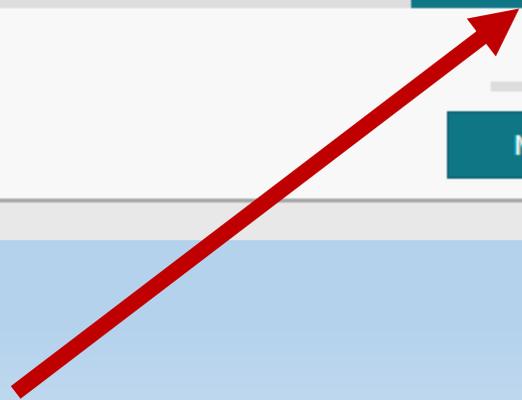


+ A ✎

Enter Field Name
Edition statement

Enter Field Help Text
Help Text

OPTIONS	VALUES	MULTIPLE	REQUIRED	SUGGESTIONS	HIDDEN
		NO	YES		
		Min one ▾	Max unlimited ▾		



- A
- Calendar
- Envelope
- #
- ...
- Search

+ A ✎

Edition statement

? 🔗

+ A ✎

Enter Field Name
Instance Type

Enter Field Help Text
Help Text

🔗 **VALUES** MULTIPLE REQUIRED SUGGESTIONS HIDDEN

Name	Type	Source	Identifier	No. Values
<p>SEARCH</p>				

A

📅

✉

#

⋮

🔍



+ A ✎



Enter Field Name

Instance Subclass



Enter Field Name
Help

Find a property in BioPortal or [Enter Property URI](#)



[Start Over](#)

Search in BioPortal

Instance Subclass



84 results for the query 'Instance Subclass'. Click on a property below to select it

PROPERTY	DEFINITION	TYPE	SOURCE	ID
instance_of	The instance_of relationship is considered axiomatic by the obo file format specification; ie it is taken for granted. The is_a relation is still included in this ontology for completeness.	Object Property	MIRO	_instance_of

Please provide the following information for the property you want to create or [Go Back to Property Search](#)

property URI*

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

ENTER PROPERTY

494 results for the query 'Instance Type'. Click on a term below to select it

TERM	DEFINITION	TYPE	SOURCE	ID	
Instance	An occurrence of something.	Class	NCIT	C48364	
Instance	Resource reflecting an individual, material embodiment of a Work.	Class	BIBFRAME	Instance	 Show Details
Instance	-	Class	BIBLIOTEK-O	Instance	
Instance	Resource reflecting an individual, material embodiment of a Work.	Class	BFLC	Instance	
Instance Identifier Data Type	A data type comprised of an identifier that uniquely characterizes an individual entity.	Class	NCIT	C95664	



TERM **BRANCH** ONTOLOGY

Term Id	http://id.loc.gov/ontologies/bibframe/Instance
Term Name	Instance

BIBFRAME classes:

- Acquisition Source
- ⊕ Sound Characteristic
- Review
- ⊖ **Instance**
 - Archival Controlled
 - Electronic
 - Printed
 - Tactile Material
 - Manuscript
- Music Ensemble
- Polarity
- Item
- Aspect Ratio
- Mount

TERM DETAILS

ONTOLOGY DETAILS

Name	Instance
Id	http://id.loc.gov/ontologies/bibframe/Instance
Definition	Resource reflecting an individual, material embodiment of a Work.

TERM

BRANCH

ONTOLOGY

Term Id <http://id.loc.gov/ontologies/bibframe/Instance>

Term Name Instance



+ A



Edition statement



+ A



Enter Field Name
Instance Type



Enter Field Help Text
Help Text

OPTIONS

VALUES

MULTIPLE

REQUIRED

SUGGESTIONS

HIDDEN

Name	Type	Source	Identifier	No. Values
------	------	--------	------------	------------

Instance	Branch	BIBFRAME	Instance	-
----------	--------	----------	----------	---



SEARCH



▼ Bibframe Instance

Instance Type

Edition statement

Date

?

|

- Archival controlled
- Electronic
- Manuscript
- Printed
- Tactile material

CANCEL

SAVE

Search in BioPortal
fiction



Advanced Search Options

I want to...

- Search for a term in BioPortal (e.g. 'microarray analysis')
- Search for an ontology in BioPortal (e.g. OBI) and explore it
- Search for a value set in BioPortal (e.g. 'Delivery Procedures') and explore it

Narrow your search to specific ontologies

LC-GENREFORM × Add ontologies

TERM	DEFINITION	TYPE	SOURCE	ID	
Fiction	-	Class	LC-GENREFORM	gf2014026339	Show Details
Paranormal fiction	Fiction that features human characters that are often involved in the occult, witchcraft, spiritualism, psychic...	Class	LC-GENREFORM	gf2014026469	
Western fiction	Fiction that features the American West during the period of westward expansion.	Class	LC-GENREFORM	gf2014026594	
Philosophical fiction	Fiction that emphasizes philosophical propositions.	Class	LC-GENREFORM	gf2016026001	
Erotic fiction	-	Class	LC-GENREFORM	gf2014026320	

TERM

BRANCH

ONTOLOGY

Term Id http://id.loc.gov/authorities/genreForms/gf2014026339

Term Name Fiction

▼ BIBFRAME Work

└ Genre/form





Template Name

BiBFRAME Instance

Template Description



+ A



Instance Type



+ A



Edition statement



A



#



CLEAR

CANCEL

SAVE TEMPLATE

Search



Elements

Work Variant Title

Work Title

Variant Title Information

Transliterated title information

Title Proper information

Instance Title



TITLE PROPER INFORMATION

LOCATION /Users/Nancy Lorimer/RDA-BF templates/RDA-BF generic elements/Title data/Title Proper information

OWNER Nancy Lorimer

MODIFIED 4/22/18 by Nancy Lorimer

CREATED 8/30/17 by CEDAR Admin

PUBLICLY READABLE

PUBLICLY WRITABLE

Description

All / Users / Nancy Lorimer / RDA-BF templates / RDA-BF generic elements / Title data

CANCEL

OPEN

+ A ✎



Instance Type



+ A ✎



Edition statement



+ 🧩



Enter Element Name

Instance Title Element



Enter Element Help Text

Main title



Subtitle



Title Part Number



Title Part Name



A



#



MULTIPLE

▼ BiBFRAME Instance

Instance Type

▼ Instance Title Element

Main title*

Subtitle

Title Part Number

Title Part Name

Edition statement

▼ Provision activity

Type of provision activity

▶ Place

▶ Publisher, Distributor, Manufacturer

Date

▼ Extent

Extent

▶ Note

Carrier type*

volume

Mode of issuance

single unit

Series statement

▼ Intended Audience

Intended Audience

▼ Identifier

<< < 1 > >>   

Identifier type

Identifier value

▶ Contribution with MADS

Identifier



	Type of identifier	Value
1	EAN	8909880989009
2	IS	
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

- ISWC
- ISBN
- ISMN
- ISNI
- ISAN
- ISRC
- ISSN
- ISTC
- ISSN-L
- ISO number
- Audio **i**ssue number

SAVE

▼ BiBFRAME Instance

Instance Type	Printed
▼ Instance Title Element	
Main title*	The Lewis man
Subtitle	a mystery
Title Part Number	
Title Part Name	
Edition statement	Reprint edition
▼ Extent	
Extent	320 pages
▼ Note	
Note:	
▼ Provision activity	
Type of provision activity	Publisher
▼ Place	
Place	London
▼ Publisher, Distributor, Manufacturer	
Type of Contributor	Organization
Name	Quercus
Date	2015
Series statement	Lewis trilogy, book 2
▶ Intended Audience	
▼ Contribution with MADS	

Type of instance

▼ Instance Title	
Title proper	
Other title information	
Part number	
Part title	
▶ Note	
Statement of responsibility relating to the Title proper	
▼ Variant Title Information	
Type of Variant Title	
Variant title (RDA 2.3.6.1)	
Variant title subtitle	
Variant title source	
▶ Variant title note	

▼ SDR Deposit

▼ Description	
▼ Title	
Main Title*	
Single or Start date	
End date	
Copyright date	
In series	
Preferred citation	
▼ Contributor(s)	
▶ Contributor	
▶ Role	
▼ Summary or Abstract	
Abstract	
▼ Keyword(s)	
Keyword(s)	

- Identifiers for
- Administrative

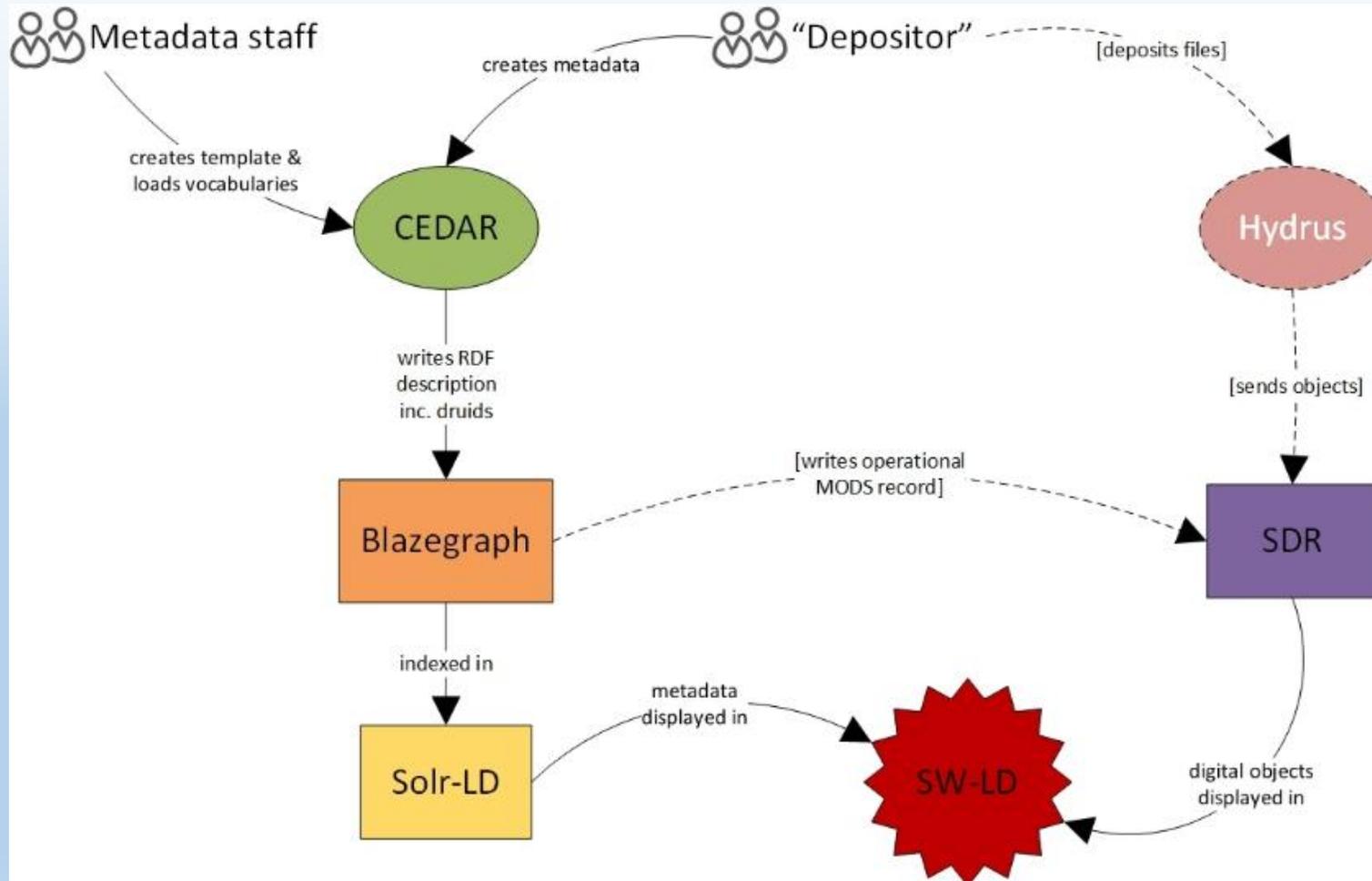


```
<http://id.loc.gov/authorities/genreForms/gf2014026089> <http://www.w3.org/2000/01/rdf-schema#label> "Discursive works" .
<http://id.loc.gov/authorities/subjects/sh2008109787> <http://www.w3.org/2000/01/rdf-schema#label> "Popular music--History and criticism" .
<http://id.loc.gov/ontologies/bibframe/Isbn> <http://www.w3.org/2000/01/rdf-schema#label> "ISBN" .
<http://id.loc.gov/ontologies/bibframe/Organization> <http://www.w3.org/2000/01/rdf-schema#label> "Organization" .
<http://id.loc.gov/ontologies/bibframe/Print> <http://www.w3.org/2000/01/rdf-schema#label> "Printed" .
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<http://id.loc.gov/vocabulary/carriers/nc> <http://www.w3.org/2000/01/rdf-schema#label> "volume" .
<http://id.loc.gov/vocabulary/mediaTypes/n> <http://www.w3.org/2000/01/rdf-schema#label> "unmediated" .
<http://purl.obolibrary.org/obo/GAZ_00275662> <http://www.w3.org/2000/01/rdf-schema#label> "City of London" .
<http://www.loc.gov/mads/rdf/v1#PersonalName> <http://www.w3.org/2000/01/rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/0198311d-35a5-4b9e-8ffa-7a9f199941c8> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/0198311d-35a5-4b9e-8ffa-7a9f199941c8> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/13979d0d-0e20-4b72-825b-f2420b0c51d3> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/13979d0d-0e20-4b72-825b-f2420b0c51d3> <http://www.w3.org/2000/01/rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/1f0e46f4-7897-4018-b986-462420e14f02> <http://id.loc.gov/ontologies/bibframe/Print> .
<https://repo.metadatacenter.org/template-element-instances/1f0e46f4-7897-4018-b986-462420e14f02> <http://id.loc.gov/ontologies/bibframe/Print> .
<https://repo.metadatacenter.org/template-element-instances/1f0e46f4-7897-4018-b986-462420e14f02> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/1f0e46f4-7897-4018-b986-462420e14f02> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/30d039e0-9bbe-48d2-8ef7-01e090261bcd> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/30d039e0-9bbe-48d2-8ef7-01e090261bcd> <http://www.w3.org/2000/01/rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/32394976-493c-4920-8475-b959fae1f9ca> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/4c99fb31-fe66-4535-bfcc-b176d18e3c88> <http://id.loc.gov/ontologies/bibframe/Print> .
<https://repo.metadatacenter.org/template-element-instances/4c99fb31-fe66-4535-bfcc-b176d18e3c88> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/686f3494-dac8-4aa4-a2be-e2ae38e1d3d1> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/686f3494-dac8-4aa4-a2be-e2ae38e1d3d1> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
<https://repo.metadatacenter.org/template-element-instances/686f3494-dac8-4aa4-a2be-e2ae38e1d3d1> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
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<https://repo.metadatacenter.org/template-element-instances/9e819488-5af2-491d-aca5-f5df5e59a0de> <http://www.w3.org/1999/02/22-rdf-schema#label> "Personal Name Type" .
```

JSON-LD



Technical Workflow from CEDAR to SDR



Cataloger Dreams

- richer metadata expressed through relationships, rather than database records
- for our data to be able to be part of, and interact with, the greater web of data
 - data that maintains its meaning outside our catalogs
- more control of our metadata world
 - templates, choices
- our work not be defined by software/database limitations
 - our choices based on need, not on MARC
 - our workflows, not imposed workflows
- broaden our metadata horizons
 - use others' metadata to enhance ours, or at least, explore that possibility
- a true shared cataloging environment, where we can build on one another's work

Testing: CEDAR & LC Editor

- CEDAR data easier to read, but both really depend on the native linked data for analysis
- CEDAR data could be edited more easily, though with some glitches
- metadata creators slightly preferred the BIBFRAME templates
 - may partly be a familiarity issue
 - may also have been partly the form of the template, which had a few errors
- some vocabularies lacking
- developers find the path to implementing locally more straight forward (this will change with improved docker technology)
- technical overhead for BF less onerous, primarily because it is already established

Benefits of the CEDAR template

- allows for individualized views of the same ontology, based on format, user-type, project, etc. while still standardizing data entry
- can mandate required data, validate it at a basic level, and provide pre-selected vocabularies
- can repeat fields and elements
- can have auto-suggestion (particularly useful for keyword entries)
- templates are linked directly to ontologies and vocabularies—no typos for URIs
- **templates intended to be created by metadata creators, not developers**
- **API for sending metadata to other repositories**
- **Template creation strongly supported by ontologies and vocabularies**
- **Support beyond just metadata creation—analysis and publication**

Drawbacks of the CEDAR Template

- ontology structure can be covered up textually, but is more apparent structurally
 - becomes somewhat clunky, given the amount of nesting of elements necessary (blank nodes)
- cannot add new fields to a template
 - can *repeat* but not *add*
- some ergonomic issues
 - a lot of clicking
- **biomedical data ecosystem simpler than that of library data**
 - **concept of multiple linking of metadata “records” new**
 - **we use *a lot* of vocabularies most are in SKOS**

Where you might want to consider CEDAR now

- web-based projects or workflows that make use of crowdsourcing
- metadata forms for use by faculty, students, and other researchers
- pulling data from web pages and creating standardized metadata from it (CEDARonDemand)

Cataloger Dreams?

- ★
 - richer metadata expressed through relationships, rather than database records
 - for our data to be able to be part of, and interact with, the greater web of data
- ★
 - more control of our metadata world (templates, choices)
 - our work not be defined by software/database limitations
- ★
 - broadening our metadata horizons
 - use others' metadata to enhance ours
 - a true shared cataloging environment, where we can build on one another's work

Grazie a tutti/tutte!!

CEDAR: <https://metadatacenter.org>

BioPortal: <https://bioportal.bioontology.org>

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