



Following the BIBFLOW Roadmap: First Steps toward a Linked Data Environment

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What is the BIBFLOW Roadmap?

BIBFLOW: A Roadmap for Library Linked Data Transition
MacKenzie Smith, Carl G. Stahmer, Xiaoli Li, Gloria
Gonzalez. University Library, University of California,
Davis ; Zepheira Inc. March 14, 2017



Outline

- Why the addition of URIs is an important 1st step
- Considerations for adding URIs to MARC data
- Options for URI enrichment



The Problem with MARC

=020 \\\$z9781554519217
=035 \\\$a(OCOLC)954429919
=049 \\\$aCUZY
=050 14\$aTD792\$b.E26 2017
=055 \0\$aTD792\$b.E26 2017
=082 04\$a363.72/88\$223
|100 1\\\$aEamer, Claire,\$d1947-\$eauthor.
=245 10\$aWhat a waste! :\$bwhere does garbage go? /\$cby Claire Eamer ; illustrations by Bambi Edlund.
=264 \1\$aToronto ;\$aBerkeley ;\$aVancouver :\$bAnnick Press,\$c[2017]
=264 \4\$c© 2017
=300 \\\$a89 pages :\$bcolour illustrations, colour portraits ;\$c24 cm
=336 \\\$atext\$btxt\$2rdacontent
=336 \\\$astill image\$bsti\$2rdacontent
=337 \\\$aunmediated\$bn\$2rdamedia
=338 \\\$avolume\$bnc\$2rdacarrier
=504 \\\$aIncludes bibliographical references and index.
=520 \\\$a"What a Waste! explores the problem of garbage and how humans have dealt with it from prehistory to modern times. Topics include how archaeologists study ancient garbage; the growth of consumer culture and disposability; food waste; the environmental effects of garbage; "problem" garbage like electronic and toxic waste; sewage and dead bodies; and garbage in the oceans and in space. Sidebars highlight people and organizations around the world who are making efforts to reduce or reuse waste."--\$cProvided by publisher.
=530 \\\$aIssued also in electronic formats.
=505 0\\\$aThe beginning of garbage -- Garbage explosion -- Down in the dumps -- A recipe for waste -- Down the drain -- The business of garbage -- Problem garbage.
=650 \0\$aRefuse and refuse disposal\$vJuvenile literature.



*“Individual data elements can regain the meaning that the entire MARC record with tags gave them by transferring the tagged data into **RDF** [Resource Description Framework] **statements with a subject, a predicate, and an object.**”*

RDF statements enable machines to understand the meaning, moving us from a traditional web to the Semantic Web.”

*Mauro Guerrini & Tiziana Possemato. “From Record Management to Data Management” *Cataloging & Classification Quarterly**



RDF Triples

Model Statement

<subject> <predicate> <object>

Example Statement

<Harper Lee> <isAuthorOf> <Go set a watchman>



What are URIs?

“URIs form the backbone of the Linked Data ecosystem.”

BIBFLOW Roadmap



RDF Triples

<<http://viaf.org/viaf/12431460>> *URI for VIAF entry for Harper Lee*

<<http://rdaregistry.info/Elements/a/P50195>> *URI for RDA element “isAuthorOf”*

<<http://worldcat.org/entity/work/id/2283978583>> *URI for OCLC Work ID for Go Set a Watchman*



Considerations for Adding URIs to MARC Data

- Authority records?
- Bibliographic records?
- Both?



Authority Records

024 7_ \$a no 93010903 \$2 lccn

024 7_ \$a 54950123 \$2 viaf

024 7_ \$a 0000000122802598 #2 isni

100 1_ \$a Clinton, Hillary Rodham

920 ___ \$a <http://id.loc.gov/authorities/names/n93010903>

921 ___ \$a <http://viaf.org/viaf/54950123>

922 ___ \$a <http://isni.org/isni/0000000122802598>



MARC Advisory Committee (MAC)

- Proposal no. 2019-03:
 - Defining Subfields \$0 and \$1 to Capture URIs in Field 024 of the MARC21 Authority Format
 - Discussion on Sunday, Jan. 27, 2:30-5:00 pm (Room 201 of WSCC)



Authority Record with URIs in 024 Field

010		n 93010903			
040		DLC †b eng †e rda †c DLC †d DLC †d NJQ †d DLC †d DLC †d OCoLC †d DLC †d WaU			
024	7	54950123 †2 viaf			
024	7	http://viaf.org/viaf/54950123 †2 uri			
024	7	0000000122802598 †2 isni			
024	7	http://isni.org/isni/0000000122802598 †2 uri	100	1	Clinton, Hillary Rodham
024	7	Q6294 †2 wikidata	368		†c First ladies †2 lcshac †s 1993 †t 2001
024	7	http://www.wikidata.org/entity/Q6294 †2 uri	368		†c Presidents' spouses †2 lcsh
024	7	http://dbpedia.org/resource/Hillary_Rodham_Clinton †2 uri	368		†c Governors' spouses †2 lcsh
024	7	316468 †2 fast	368		†c Democratic Party members (United States) †2 lcdgt
024	7	http://id.worldcat.org/fast/316468 †2 uri	370		Chicago (Ill.) †c United States †f Arkansas †f New York (State) †2 naf
			370		†e Park Ridge (Ill.) †e Fayetteville (Ark.) †e Little Rock (Ark.) †2 naf
			370		†e Chappaqua (N.Y.) †2 naf †s 1999
			372		United States--Politics and government †2 lcsh
			373		United States. Congress. Senate †2 naf †s 2001 †t 2009
			373		United States. Department of State †2 naf †s 2009 †t 2013



Bibliographic Record Considerations

- Controlled vocabularies
- Authority/Concept vs. Real World Object
- Partially matched subject headings



Controlled Vocabularies: Authorities

- Library of Congress Name Authority (LC NAF)
- Library of Congress Subject Headings (LCSH)
- Faceted Application of Subject Terminology (FAST)



Controlled Vocabularies: Concepts

- RDA 3xx Data Elements
 - Content, media, carrier types (336-338)
 - Video format (346)
 - File type (347)
- GAMECIP Computer Game Platform Controlled Vocabulary



GAMECIP Computer Game Platform Example

753 \\ \$a Nintendo Wii \$2 gcipplatform

753 \\ \$a Nintendo Wii \$0

<http://gamemetadata.org/uri/platform/1129> \$2 gcipplatform



Two Types of URIs

- URIs for *Authorities* (documents about things)
- URIs for *Things* the Authority describes (Real World Objects)

Formulating and Obtaining URIs: A Guide to Commonly Used Vocabularies and References Sources / prepared by the Program for Cooperative Cataloging Task Group on URIs in MARC. 2018



Authority Record Example

100 1\ \$a Chalamet, Timothée

372 \ \$a Acting \$2 lcs

374 \ \$a Actors \$2 lcs

375 \ \$a male

377 \ \$a eng

670 \ \$a Interstellar, 2015: \$b credit sequence (Timothée Chalamet)



Controlled Vocabulary for a Concept



Vocabulary: Show detail for RDA Carrier Type

Detail	Concepts	History	Versions	Maintainers	Export	Import
?	Preferred Label	URI	Status	Updated	?	
	aperture card	.../termList/RDACarrierType/1021	Published	2017-07-29 16:43		
	audio belt	.../termList/RDACarrierType/1070	Published	2017-07-29 16:43		
✓	Audio carriers (Deprecated)	.../termList/RDACarrierType/1001	Deprecated	2016-07-11 19:01		
	audio cartridge	.../termList/RDACarrierType/1002	Published	2017-07-29 16:43		
	audio cylinder	.../termList/RDACarrierType/1003	Published	2017-07-29 16:43		
	audio disc	.../termList/RDACarrierType/1004	Published	2017-07-29 16:43		
	audio roll	.../termList/RDACarrierType/1006	Published	2017-07-29 16:43		
	audio wire reel	.../termList/RDACarrierType/1071	Published	2017-07-29 16:43		



Concept



Vocabulary: RDA Carrier Type
Concepts: online resource

Detail

Properties

History

Detail

Preferred Label:	online resource
Language:	English
URI:	http://rdaregistry.info/termList/RDACarrierType/1018 (RDF)
Top Concept?:	
Status:	Published



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Real World Objects

- International Standard Name Identifier (ISNI)
- Virtual International Authority File (VIAF)
- Wikidata



MARC Proposal No. 2017-08

- Subfields \$0 (authorities) and \$1 (Real World Objects) defined for URIs
- <Hamlet> <wasAuthoredBy> <William Shakespeare>
- “A person can be an author, but a record cannot.”



Authority URI (\$0) or Real-World Object URI (\$1)

*Formulating and Obtaining URIs: A Guide to
Commonly Used Vocabularies and Reference
Sources* / prepared by the Program for Cooperative
Cataloging Task Group on URIs in MARC, 2018-02-
14.



Authority URI (\$0) or Real-World Object URI (\$1)

Authority URI Additions (\$0)

- LC NAF
- LCSH
- GAMECIP Computer
Game Platform

Real World Object (RWO) URI Additions (\$1)

- ISNI
- VIAF



Name Authority & RWO Example

100 1\ \$a Kandinsky, Wassily, \$d 1866-1944

100 1\ \$a Kandinsky, Wassily, \$d 1866-1944 \$0

<http://id.loc.gov/authorities/names/n79059310>

\$1 <http://viaf.org/viaf/22143802>

\$1 <http://isni.org/isni/000000121235624>



Subject Strings

- Add URIs to fully matched headings only?
- Add URIs to partially matched headings also?



LCSH Example

650 \0 \$a Guitar music

650 \0 \$a Guitar music \$0

<http://id.loc.gov/authorities/subjects/sh85057830>

650 \0 \$a Southern States \$x Race relations \$v Fiction.



Options for Achieving URI Enrichment

- Vendor services
 - Backstage
 - Marcive



Options for Achieving URI Enrichment

- MarcEdit Linked Data Tool

MARCNext

MARCNext

MARCNext is a laboratory space to introduce new tools and concepts related to the integration of linked data and semantic web concepts into library metadata.



BibFrame Testbed



Link Identifiers



OpenRefine
Integration



SPARQL Browser



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Build Linked Records



The Linked Data Tool has been designed to loop through a set of MARC records and resolve access points in the 1xx, 6xx, and 7xx data elements to their linked data end-points.

Source File:

ge\CDL_SCP\SCP Monos\180604\UCSC_Mono180604_UPDtest2.mrd

Save File:

C:\Users\barrett\Documents\@Alma Usage\CDL_SCP\SCP Monos\

Rules File:

C:\Users\barrett\AppData\Roaming\marcredit7\configs\linked_dat

Process

Service Status

Close

Status:

ID Services

AutoDetect Main/Added Entry

Embed OCLC Work ID

AutoDetect Subject ID

OCLC Number:

Process 3xx Fields

Limit Resolution to:



=100 1\\${a}Nishizaki, Takako,\$d1944-\$4itr
=245 10\${a}Indra's paradise :\$bthe essence of Thai music
=246 30\${a}Essence of Thai music
=260 \\\\${a}[Place of publication not identified] :\$bMarco Polo,\$c[2007]
=300 \\\\${a}1 online resource (1 sound file)
=306 \\\\${a}000448\${a}000453\${a}001138\${a}000423\${a}000829\${a}000339\${a}000828
=336 \\\\${a}performed music\$bprm\$2rdacontent
=337 \\\\${a}computer\$bc\$2rdamedia
=338 \\\\${a}online resource\$bcr\$2rdacarrier
=500 \\\\${a}Streaming audio
=500 \\\\${a}Title from image of compact disc cover on Web page (viewed May 10, 2006)
=505 0\\${a}Golden angel (4:48) -- Oracle of light (4:53) -- Indra's paradise (11:38) -- Laotian chipmunk (4:23) --
Tales from the waterfall of Saiyok (8:29) -- Cambodian rowing song (3:39) -- Hill-tribe dance (8:28)
=511 0\\${a}Takako Nishizaki, violin ; Bruce Gaston, piano
=599 \\\\${a}NEW\$c180529
=650 \0\${a}Violin and piano music
=650 \0\${a}Indra (Hindu deity)\$vSongs and music
=650 \0\${a}Music\$zThailand
=655 \0\${a}Streaming audio



=100 1\\$\aNishizaki, Takako,\$d1944-\$4itr\$0<http://id.loc.gov/authorities/names/n85194014>
 \$1<http://viaf.org/viaf/59282090/>\$1[http://dbpedia.org/resource/Takako Nishizaki](http://dbpedia.org/resource/Takako_Nishizaki)
 =245 10\$aIndra's paradise :\$bthe essence of Thai music|
 =246 30\$aEssence of Thai music
 =260 \\\$a[Place of publication not identified] :\$bMarco Polo,\$c[2007]
 =300 \\\$a1 online resource (1 sound file)
 =306 \\\$a000448\$a000453\$a001138\$a000423\$a000829\$a000339\$a000828
 =336 \\\$aperformed music\$bprm\$2rdacontent\$0<http://id.loc.gov/vocabulary/contentTypes/prm>
 =337 \\\$acomputer\$bc\$2rdamedia\$0<http://id.loc.gov/vocabulary/mediaTypes/c>
 =338 \\\$aonline resource\$bcr\$2rdacarrier\$0<http://id.loc.gov/vocabulary/carriers/cr>
 =500 \\\$aStreaming audio
 =500 \\\$aTitle from image of compact disc cover on Web page (viewed May 10, 2006)
 =505 0\\$\aGolden angel (4:48) -- Oracle of light (4:53) -- Indra's paradise (11:38) -- Laotian chipmunk
 (4:23) -- Tales from the waterfall of Saiyok (8:29) -- Cambodian rowing song (3:39) -- Hill-tribe dance
 (8:28)
 =511 0\\$\aTakako Nishizaki, violin ; Bruce Gaston, piano
 =599 \\\$aNEW\$c180529
 =650 \0\$aViolin and piano music\$0<http://id.loc.gov/authorities/subjects/sh85143580>
 =650 \0\$aIndra (Hindu deity)\$vSongs and music
 =650 \0\$aMusic\$zThailand\$0<http://id.loc.gov/authorities/subjects/sh93005467>
 =655 \0\$aStreaming audio\$0<http://id.loc.gov/authorities/subjects/sh2007010262>



Options for Achieving URI Enrichment

- Library Systems – Alma
 - Library of Congress Names
 - Library of Congress Subjects
 - Medical Subject Headings
 - German National Library Headings
 - Virtual International Authority File



Kandinsky: Parisian period, 1934-1944 / Essays by Gaëtan Picon, Rose-Carol Washton, and Nina Kandinsky.

Edit Record

Holdings



Book {Book - Physical} text; unmediated; volume By Kandinsky, Wassily, ([New York] : M. Knoedler, 1969)

Language: English

Subject: Kandinsky, Wassily,--1866-1944--Exhibitions.

Record number: (CU-SC)b17140687-01cdl_scr_inst

Update Date: 12/05/2018

● Physical (1)

Electronic

Digital

Other details

Linked Data



Context	https://open-na.hosted.exlibrisgroup.com/alma/contexts/bib	
bibo:oclcnum	http://www.worldcat.org/oclc/91092	(OCoLC)91092
dct:creator	http://id.loc.gov/authorities/names/n79059310	Kandinsky, Wassily, 1866-1944.
dct:creator	http://viaf.org/viaf/sourceID/LC/n79059310	Kandinsky, Wassily, 1866-1944.
dct:contributor	http://id.loc.gov/authorities/names/n79111353	Long, Rose-Carol Washton.
dct:contributor	http://viaf.org/viaf/sourceID/LC/n79111353	Long, Rose-Carol Washton.
dct:contributor	http://id.loc.gov/authorities/names/n93078459	Kandinsky, Nina.
dct:contributor	http://viaf.org/viaf/sourceID/LC/n93078459	Kandinsky, Nina.
dct:contributor	http://id.loc.gov/authorities/names/n50019731	Picon, Gaëtan.
dct:contributor	http://viaf.org/viaf/sourceID/LC/n50019731	Picon, Gaëtan.



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URIs a First Step to Linked Data

“By embedding http URIs, one’s metadata no longer becomes static but, rather, has the potential to place itself within the larger context of the information space and inherit properties and relationships found about a described concept from this larger Web of knowledge.”

Jackie Shieh & Terry Reese (2015) “The Importance of Identifiers in the new Web Environment and Using the Uniform Resource Identifier (URI) in Subfield Zero (\$0): A Small Step That Is Actually a Big Step,” *Journal of Library Metadata*, 15: 3-4, 208-226.



Sources

BIBFLOW: A Roadmap for Library Linked Data Transition MacKenzie Smith, Carl G. Stahmer, Xiaoli Li, Gloria Gonzalez. University Library, UC, Davis ; Zepheira Inc. March 14, 2017

Jackie Shieh & Terry Reese (2015) “The Importance of Identifiers in the new Web Environment and Using the Uniform Resource Identifier (URI) in Subfield Zero (\$0): A Small Step That Is Actually a Big Step,” *Journal of Library Metadata*, 15: 3-4, 208-226.



Sources

Formulating and Obtaining URIs: A Guide to Commonly Used vocabularies and Reference Sources / PCC Task Group on URIs in MARC (February 14, 2018)

MARC Proposal No. 2017-18 (May 16, 2017)

MARC Proposal No. 2019-03 (December 12, 2018)

Mauro Guerrini & Tiziana Possemato (2016) From Record Management to Data Management: RDA and New Application Models BIBFRAME, RIMMF, and OliSuite/WeCat, *Cataloging & Classification Quarterly*, 54:3, 179-199,





Thank you

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