Linked Data for Production (LD4P)

TECHNICAL SERVICES WORKFLOW EVOLUTION THROUGH TRACER BULLETS (STANFORD PROJECTS)

Arcadia Falcone
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Introduction:

LD4P, ITS GOALS & ITS CONTEXT IN THE CURRENT LIBRARY TECHNICAL SERVICES PARADIGM
Linked Data for Production

- Overall focus:
  Lay the groundwork for moving library technical services workflow into a linked data environment

- Subprojects within each institution:
  - ontology development
  - tools investigation
  - workflow analysis
Stanford Projects

Performed Music Ontology (PMO)
• Extension to BIBFRAME 2.0

Workflows in Technical Services (“tracer bullets”)
• MARC-based workflows (vendor-supplied cataloging, original cataloging)
• digital repository workflows (individual & bulk deposit of metadata)
Workflows:

MODELING METADATA PROCESSES FOR A HYBRID LINKED DATA ENVIRONMENT

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Goals

◦ To understand current technical services workflows both as specific tasks and generalized processes

◦ To model the processes of parallel linked data workflows, with their relationships to each other and to current workflows

◦ To begin identifying implementation specifications for systems, tools, and training
The “tracer bullet” paradigm

- Lightweight, end-to-end implementation with real data
Parameters

- A hybrid environment involving MARC, MODS, BIBFRAME, and other standards will continue to exist both locally and globally
  - “Hybrid production” workflows

- The endpoint is a discovery layer that integrates MARC, MODS, and BIBFRAME data

- Processes should be scalable and require no additional human intervention beyond current workflows

- Processes should be defined so as to be modular and tool-agnostic
Four selected workflows

1. Vendors supply MARC records that an automated process loads into our ILS
   ...and into our triplestore as linked data

2. Metadata staff create original description of resources
   ...natively in a linked data editor

3. Users create description as part of digital object self-deposit in a web-based interface
   ...that is stored as linked data

4. A bulk process transforms structured metadata for a large collection of digital objects
   ...into linked data describing objects in our digital repository
Roadmap for workflow analysis

- Comprehensive representation of current workflow
- High-level model of current workflow
- High-level model of linked data workflow
- Merged high-level model of hybrid workflow
- Tracer bullet implementation of hybrid workflow
Workflow #1: task-based model

1. Order arrives
   - ACQ receiver wand barcode
   - ACQ receiver changes location to “IN PROCESS”
   - ACQ receiver reviews record
   - “item received”
   - ACQ receiver overlays copy
   - Needs work
   - OK
   - Adds 910 routing note to record
   - “left ACQ”
   - SYS loads vendor’s full bib records
   - SYS autoreads vendor’s provisional bib records into Symphony and generates order records from 9XXs
   - SYS creates provisional bib records and order records in Symphony
   - Record published in SearchWorks

2. Update record with:
   - ACQ supervisor reviews
   - ACQ supervisor adds 910 routing note to record
   - No copy
   - OCLC copy
   - ACQ supervisor routes to CLASS
   - CLASS updates record

3. Bind & Finishing
   - SYS autoreads vendor’s full bib records into Symphony
   - SYS autoreads vendor’s full bib records
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

4. CASALINI TOCs
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

5. NIELSEN
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

6. BACKSTAGE
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

7. BOOKPLATES
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

8. OCLC
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

9. OCLC adds SUL holdings
   - SYS autoreads TOC PDFs to SUL server
   - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
   - SYS auto-overlays records (Saturday)

10. OCLC returns master record IDs
    - SYS autoreads TOC PDFs to SUL server
    - SYS autoreads data with 956, 920, 986 (Mon. or Tue.)
    - SYS auto-overlays records (Saturday)
Workflow #1: process-based model

Vendor
- Provide MARC records & updates

ILS
- Enhance MARC data

Vendors

Triplestore
- Map & index
- Link to operational record

Index
- Provide indexed data

Unified discovery layer

MARC to BIBFRAME converter
- Send data

Reconciliation services
- Receive reconciled data

SPARQL endpoint/API
- Map & index
- Expose data

Workflow #2: task-based model

1. ACQ puts items on truck
2. Truck goes to MDU
3. MDU selects items from truck (~20%)
4. After 24 hours, truck goes to CLASS
5. CLASS handles remaining items (~80%)
6. Binding & Finishing or SAL3

Original cataloging workflow:

- Add routing note
- Confirm no usable copy in OCLC
- OCLC client application
- Insufficient record: update
- No record: use workflow
- Describe item
- Publish record to OCLC
- Export record from OCLC
- Load record to Symphony
- (Auto) Add holdings to OCLC

Authority work (NACO):
- Name
- Series
- Authority files from OCLC client
- Use existing authority
- Establish new authority
- Use new authority

Subject analysis (SACO):
- Subject
- LC Call Number
- Identify subject terms and call number class
- Use existing term or class
- Propose new term or class
- Use new term or class

Monitor process and revise record if term not approved
Workflow #2: process-based model

External bib. & authority records
- update
- search & import
- link to operational record
- enhance MARC data
- pass record
- map & index
- provide indexed data
- map & index

External RDF & URIs
- update(?)
- lookup

MARC editor
- pass record

ILS
- link to operational record

Index
- map & index

Unified discovery layer
- provide indexed data

BIBFRAME editor
- lookup

Triplestore
- lookup
- expose data

SPARQL endpoint/API
- map & index

Reconciliation services
- return reconciled data

Vendors

Workflow:
1. External bib. & authority records update -> MARC editor search & import -> ILS link to operational record -> Index provide indexed data
2. External RDF & URIs update(?) -> lookup -> BIBFRAME editor lookup -> Triplestore lookup -> SPARQL endpoint/API expose data
3. MARC editor pass record -> ILS enhance MARC data
4. Reconciliation services return reconciled data
Ckey to Bibframe2 Conversion

Ckey for conversion: 123

Base URI for local namespace: http://id4p.stanford.edu/

Do conversion

MarcXML for ckey 123

```xml
<marcxml:collection xmlns:marcxml="http://www.loc.gov/MARC21/slim">
  <marcxml:record>
    <marcxml:leader>00920ccn a2200265 4500</marcxml:leader>
    <!--MarcXML for 123-->
  </marcxml:record>
</marcxml:collection>
```

Bibframe2 for ckey 123

```xml
  <BibFrame:AdminMetadata>
    <BibFrame:GenerationProcess>
      <BibFrame:GenerationProcess>
        <rdf:RDF xmlns:dcterms="http://purl.org/dc/terms/">
          <dcterms:isPartOf rdf:resource="http://id.loc.gov/ontologies/bibframe/"/>
        </rdf:RDF>
      </BibFrame:GenerationProcess>
    </BibFrame:GenerationProcess>
  </BibFrame:AdminMetadata>
</rdf:RDF>
```
Bulk Conversion with URIs or Fingerprints

Authority Lookups

.mrc #MARCXML BIBFRAME ModBibFrame
LD4L BIBFRAME Converter Pipeline
Component Straw-man for Conversion with Reconciliation Workflow

Converters [temp uris]

Reconciler*

Entity lookup

Entity index/search (e.g. solr)

RDF (e.g. VIAF)

Sync

Entity containers/stores (e.g. F4)

Sparql Endpoint (public triplestore)
Component Straw-man for Conversion + Editor + Reconciliation Workflow

- Editor
- Reconciler*
- Entity lookup
- Entity index/search (e.g., solr)
- RDF (e.g., VIAF)
- Converters [temp uris]
- MARC
- Entity containers/stores (e.g., F4)
- Sparql Endpoint (public triplestore)
Component Diagram for Conversion with Reconciliation
Workflow with Pipeline Architecture
Component Diagram for Conversion Workflow with Pipeline Architecture, Reified

- Reactive Stream based microservices build with akka Stream ensure a fast ingestion or digestion by performing an optimal use of the resources of the machines in term of concurrent. They implement the Reactive stream protocol that is based on a push and pull model (asynchronous non blocking and back-pressure)
### BIBFRAME 2 to Solr Mapping

<table>
<thead>
<tr>
<th>Solr Index Field</th>
<th>Description</th>
<th>LC MARC&gt;BF2 Mapping Spec</th>
<th>Bibframe2</th>
</tr>
</thead>
<tbody>
<tr>
<td>id ✓</td>
<td>ckey</td>
<td></td>
<td>derived from BF2:instance identifier?</td>
</tr>
<tr>
<td>all_search</td>
<td>all searchable text</td>
<td></td>
<td>value of all the labels associated with .</td>
</tr>
<tr>
<td>collection ✓</td>
<td>constant: &quot;bf2&quot;</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

#### Title fields

| title_245a_search ✓ | 245a | mainTitle () | BF2:mainTitle? |
| title_245_search ✓  | 245abfgknps | approx: rdfs:label (); does not include $b approx: mainTitle () + subtitle () + originDate (W) + partNumber () + partName (); both $f and $g map to originDate; $k not mapped | |
| title_245a_display ✓ | short title, without trailing punctuation ; | mainTitle () | |
BIBFRAME 2 SPARQL Queries

**Gets the "main title" of an instance; title_245a_search**

```sparql
PREFIX bf: <http://id.loc.gov/ontologies/bibframe/>
SELECT ?o
WHERE {
  ?t bf:mainTitle ?o.
  FILTER NOT EXISTS {
    ?t rdfs:subClassOf* bf:VariantTitle.
  }
}

select distinct ?s ?title ?titleType ?titleLabel
Where {
  ?s a bf:Instance.
  ?title a ?titleType.
  FILTER NOT EXISTS {
    ?titleType rdfs:subClassOf* bf:VariantTitle.
  }
}
```
Conversion Questions

- URIs—where do you get them?
- are there other enhancements you can do?
- granularity of conversion
- adding local field conversions to a more generic converter
  - converter maintenance
- compatibility with other conversions and original metadata creation
Getting URIs

- BACKSTAGE LIBRARY WORKS
  - Providing LC-NAR, VIAF, ISNI URIs for a few years now in authority records
  - Recently began adding selected URIs directly in bib records

- SHARE-Virtual Discovery Environment
  - Has taken converted our entire bib file
  - Can convert MARC to BIBFRAME, and soon MODS to BIBFRAME
  - Has ability to reconcile at basic and enhanced levels
DATA CREATION

REQUIREMENTS & TOOLS

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The Bibframe Editor...

Needs prefabricated triples (i.e. profiles) and a way to apply them to your work

Needs a place to temporarily remember the data
  ◦ Memory store
  ◦ Loopback API Server (a la loopback.io)

Needs a way to fetch changes made to profiles
  ◦ Profile-edit server with http file endpoint
  ◦ Trigger file download

Needs a way to do lookups to id.loc.gov and other sources
  ◦ Cross-domain Scripting

Needs a way and a place to permanently store the triples data
  ◦ Reformat JSON to suit needs of posting to triplestore

Needs a way to handle Reconciliation...
Lookups: LOC Suggest API

http://id.loc.gov/authorities/performanceMediums/suggest/?ensemble

[["Appalachian dulcimer","Baltic psaltery","Baroque lute","English guitar","English horn","Hardanger fiddle","Irish harp","Jew's harp","MIDI controller","Native American flute"],["1 result","1 result","1 result","1 result","1 result","1 result","1 result","1 result","1 result","1 result"],[
"http://id.loc.gov/authorities/performanceMediums/mp2013015022",
"http://id.loc.gov/authorities/performanceMediums/mp2013015373",
"http://id.loc.gov/authorities/performanceMediums/mp2013015059",
"http://id.loc.gov/authorities/performanceMediums/mp2013015250",
"http://id.loc.gov/authorities/performanceMediums/mp2013015251",
"http://id.loc.gov/authorities/performanceMediums/mp2013015321",
"http://id.loc.gov/authorities/performanceMediums/mp2013015356",
"http://id.loc.gov/authorities/performanceMediums/mp2013015360",
"http://id.loc.gov/authorities/performanceMediums/mp2013015474",
"http://id.loc.gov/authorities/performanceMediums/mp2013015495"]}
Lookups: rdaregistry.info & id.loc.gov
getting ID and English label

http://rdaregistry.info/termList/RDAproductionMethod.jsonld

http://id.loc.gov/authorities/performanceMediums.json
RDF to TripleStore (BFE Produced)

```json
{
    "created": "2017-07-28T15:30:57.000Z",
    "id": 4,
    "modified": "2017-07-28T15:30:57.000Z",
    "name": "HAr1501255857",
    "rdf": [
        {}, {}, {}
    ],
    "url": "https://ld4p-loc-bfe-dev.stanford.edu/verso/api/bfs/HAr1501255857"
}
```
RDF to TripleStore (JSON-LD)

```json
{
    "@context": {
        "created": "2017-07-28T15:30:57.00Z",
        "id": 4,
        "modified": "2017-07-28T15:30:57.00Z",
        "name": "HAr1501255857",
        "url": "https://ld4p-loc-bfe-dev.stanford.edu/verso/api/bfs/HAr1501255857"
    },
    "@graph": [
        {}, {}, {}
    ]
}
```
PMO Sound Recording

Profile
Performance
BIBFRAME Work (RDA Work Elements)
BIBFRAME Work (RDA Expression Elements)
BIBFRAME Instance (RDA Manifestation)
BIBFRAME Item (RDA Item)
Performance name

Add Resource Template

Save
Delete

Cancel

Verbose Export
Brief Export
### BIBFRAME Work (RDA Work Elements)

<table>
<thead>
<tr>
<th>ID</th>
<th>Resource URI</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>profile:RDA:work</td>
<td><a href="http://id.loc.gov/ontologies/bibframe/">http://id.loc.gov/ontologies/bibframe/</a></td>
<td></td>
</tr>
</tbody>
</table>

**Guiding statement for the use of this resource**

- **Lookup**
  - Creator of Work (RDA 19.2)
  - Title Information (Title Information (RDA 6.14.2, RDA 6.14.3))
  - Form of Work (RDA 6.3)
  - Date of Work (RDA 6.4)
  - Place of Origin of the Work (RDA 6.5)
  - Other Distinguishing Characteristics of the Work (RDA 6.6)
  - Numerical Designation of a Musical Work (RDA 6.16)
  - Medium of Performance
  - Opus number statement (RDA 6.16.1.3.2)
  - Thematic catalog statement
  - Key and mode (RDA 6.17)
  - Music mode
  - Pitch center
  - Nature of the Content (RDA 7.2)
  - (Geographic) Coverage of the Content (RDA 7.3)
  - (Temporal) Coverage of the Content (RDA 7.3)
  - Intended Audience (RDA 7.7)
  - Other Person, Family, or Corporate Body Associated With a Work (RDA 19.3)
  - Subject of the Work (RDA Chapter 23)
### BIBFRAME Instance (RDA Manifestation)

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance of</td>
<td></td>
</tr>
<tr>
<td><strong>Title Information (RDA 2.3)</strong></td>
<td>Instance Title</td>
</tr>
<tr>
<td><strong>Statement of Responsibility Relating to</strong></td>
<td>Statement of Responsibility Relating to Title Proper (RDA 2.4.2)</td>
</tr>
<tr>
<td><strong>Edition Statement (RDA 2.6)</strong></td>
<td>Edition Statement (RDA 2.6)</td>
</tr>
<tr>
<td><strong>Publication, Distribution, Manufacture Statements (RDA 2.8-2.10)</strong></td>
<td>Publication Activity, Distribution Activity, Manufacture Activity</td>
</tr>
<tr>
<td><strong>Copyright Date (RDA 2.11)</strong></td>
<td>Copyright Date (RDA 2.11)</td>
</tr>
<tr>
<td><strong>Series Statement (RDA 2.12)</strong></td>
<td>Series Statement (RDA 2.12)</td>
</tr>
<tr>
<td><strong>Mode of issuance (RDA 2.13)</strong></td>
<td>Mode of issuance</td>
</tr>
<tr>
<td><strong>Issue, Distributor Number(s) (RDA 2.15)</strong></td>
<td>Sound recording issue number, Music Distributor number</td>
</tr>
<tr>
<td><strong>Media type (RDA 3.2)</strong></td>
<td>Media type</td>
</tr>
<tr>
<td><strong>Carrier (RDA 3.3)</strong></td>
<td>Carrier type</td>
</tr>
<tr>
<td><strong>Extent (RDA 3.4)</strong></td>
<td>Extent</td>
</tr>
<tr>
<td><strong>Dimensions (RDA 3.5)</strong></td>
<td>Dimensions</td>
</tr>
<tr>
<td><strong>Base Material (RDA 3.6), Applied Material (RDA 3.7)</strong></td>
<td>Base material, Applied material</td>
</tr>
<tr>
<td><strong>Type of Recording (RDA 3.16.2)</strong></td>
<td>Type of recording</td>
</tr>
<tr>
<td><strong>Playing Speed (RDA 3.16.4)</strong></td>
<td>Playing speed</td>
</tr>
<tr>
<td><strong>Recording Medium (RDA 3.16.3)</strong></td>
<td>Recording medium</td>
</tr>
<tr>
<td><strong>Disc characteristics (Groove, cutting) (RDA 3.16.5-3.16.6)</strong></td>
<td>Groove characteristics, Disc Cutting Technique</td>
</tr>
<tr>
<td><strong>Tape configuration (RDA 3.16.7)</strong></td>
<td>Tape configuration</td>
</tr>
<tr>
<td><strong>Configuration of Playback Channels (RDA 3.16.8)</strong></td>
<td>Configuration of Playback Channels</td>
</tr>
<tr>
<td><strong>Special Playback Characteristic (RDA 3.16.9)</strong></td>
<td>Special Playback Characteristic</td>
</tr>
<tr>
<td><strong>File type, encoding format, file size, bitrate (RDA 3.19)</strong></td>
<td>File type, Encoding format, File size, Encoded bitrate</td>
</tr>
</tbody>
</table>
BioPortal/BiblioPortal

- repository of biomedical ontologies

- provides
  - ontology summaries & histories
  - viewing statistics
  - ontology details—classes & properties in hierarchies
  - mapping ability

- new “slice” called BiblioPortal
  - are working to make it a more independent portal
**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: 6/3/17

**schema.org (SCHEMA)**

A collection of schemas that webmasters can use to markup HTML pages in ways recognized by major search providers, and that can also be used for structured data interoperability (e.g.

Uploaded: 5/19/17

**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

**CIDOC Conceptual Reference Model (CIDOC-CRM)**

The CIDOC Conceptual Reference Model (CRM) provides definitions and a formal structure for describing the implicit and explicit concepts and relationships used in cultural heritage documentation.

Uploaded: 8/31/17

**Web Annotation Ontology (OA)**
<table>
<thead>
<tr>
<th>ACRONYM</th>
<th>BIBFRAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISIBILITY</td>
<td>Public</td>
</tr>
<tr>
<td>BIBPORTAL PURR</td>
<td><a href="http://purl.bioontology.org/ontology/BIBFRAME">http://purl.bioontology.org/ontology/BIBFRAME</a></td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>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.</td>
</tr>
<tr>
<td>STATUS</td>
<td>Production</td>
</tr>
<tr>
<td>FORMAT</td>
<td>OWL</td>
</tr>
<tr>
<td>CONTACT</td>
<td>John Graybeal, <a href="mailto:jgraybeal@stanford.edu">jgraybeal@stanford.edu</a></td>
</tr>
<tr>
<td>HOME PAGE</td>
<td><a href="https://www.loc.gov/bibframe/">https://www.loc.gov/bibframe/</a></td>
</tr>
<tr>
<td>PUBLICATIONS PAGE</td>
<td><a href="https://www.loc.gov/bibframe/docs/index.html">https://www.loc.gov/bibframe/docs/index.html</a></td>
</tr>
<tr>
<td>DOCUMENTATION PAGE</td>
<td><a href="https://www.loc.gov/bibframe/docs/index.html">https://www.loc.gov/bibframe/docs/index.html</a></td>
</tr>
<tr>
<td>CATEGORIES</td>
<td>Other, Upper Level Ontology</td>
</tr>
<tr>
<td>GROUPS</td>
<td>Bibliographic Materials Group</td>
</tr>
<tr>
<td>NUMBER OF CLASSES</td>
<td>168</td>
</tr>
<tr>
<td>NUMBER OF INDIVIDUALS</td>
<td>0</td>
</tr>
<tr>
<td>NUMBER OF PROPERTIES</td>
<td>195</td>
</tr>
<tr>
<td>MAXIMUM DEPTH</td>
<td>2</td>
</tr>
<tr>
<td>MAXIMUM NUMBER OF CHILDREN</td>
<td>75</td>
</tr>
<tr>
<td>AVERAGE NUMBER OF CHILDREN</td>
<td>9</td>
</tr>
<tr>
<td>CLASSES WITH A SINGLE CHILD</td>
<td>3</td>
</tr>
<tr>
<td>CLASSES WITH MORE THAN 25 CHILDREN</td>
<td>2</td>
</tr>
<tr>
<td>CLASSES WITH NO DEFINITION</td>
<td>2</td>
</tr>
</tbody>
</table>

Visits

![Visits Chart](chart.png)
Property Details

Labels

Book format

Definitions

Result of folding a printed sheet to form a gathering of leaves.

ID

http://id.loc.gov/ontologies/bibframe/bookFormat
CEDAR = The Center for Expanded Data Annotation and Retrieval

**Mission:** CEDAR will develop information technologies that make authoring complete metadata much more manageable, and that facilitate using the metadata in further research.

**Elements:**
- Interfaces and tools built and tested specifically for metadata creation
- Consistency in terminology
- Machine learning
- Editing capabilities
- Training and outreach
- Building on past work and leveraging ongoing collaborations
<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>DEFINITION</th>
<th>TYPE</th>
<th>SOURCE</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>affiliation</td>
<td>An organization that this person is affiliated with. For example, a school/university, a club, or a team.</td>
<td>Annotation Property</td>
<td>SCHEMA</td>
<td>affiliation</td>
</tr>
<tr>
<td>affiliation</td>
<td>-</td>
<td>Datatype Property</td>
<td>CANCO</td>
<td>affiliation</td>
</tr>
<tr>
<td>affiliation</td>
<td>-</td>
<td>Annotation Property</td>
<td>DCAT</td>
<td>affiliation</td>
</tr>
<tr>
<td>Affiliation Ended</td>
<td>The date an individual ceased to be affiliated with an organization.</td>
<td>Datatype Property</td>
<td>MADS-RDF</td>
<td>affiliationEnd</td>
</tr>
</tbody>
</table>
CEDAR entry form
BF templates for RDA book cataloging
LC Editor vs CEDAR: Similarities

- ability to do custom labelling that “hides” the ontology terms
- ability to do lookups to value vocabularies
- default values
- ability to repeat “fields”
- can use multiple ontologies
- primary output in JSON-LD
- neither deals well at the moment with multiple properties for the same class
- the profile/template provides the primary definition of the application profile
LC Editor vs CEDAR: Differences

**LC**
- properties & classes entered manually by profile creator
- individual elements are reusable, using the same profile; when the element changes in one place, it changes in every profile it is used in
- look ups restricted to full vocabularies (e.g. all LCGFT)
- no validation or extended application profile ability (e.g. date type) beyond basic profile

**CEDAR**
- properties and classes added through lookup & directly linked to ontology
- individual elements are reusable, but must be duplicated in each template; when the element changes in one place, it does not change in other places
- look ups can be restricted to individual children of a class or to hand-picked values
- validation of entries including text, date (provides xsd:date), URIs, numbers
Moving forward...

- **Internal**
  - working to complete workflow analysis
  - making current tracer bullets more robust & integrating SHARE-VDE & BSLW
  - further enhancement of CEDAR templates

- **SHARE-VDE**
  - more conversion (MODS to BF and MARC to BF extensions)
  - reconciliation of URIs
  - data enhancements
  - exploring potential for sharing data

- **Broader Community**
  - work with the PCC to host a linked data sandbox for community experimentation
  - filling out application profiles to include relationships from RDA Registry
  - working with the community to make BF a more community-based ontology