BIBFRAME Interoperability Group

Tackling Implementation Challenges Across Institutions

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2025 Metadata Standards Symposium

Presenters (in presentation order)

- Xiaoli Li, University of California Davis Library

- Kalli Mathios, Stanford University

- Tiziana Possemato, Partner and director of @Cult (Casalini Libri Group)

Sincere thanks to all members of BIG for their exceptional contributions to the work featured in this presentation. Special thanks to Ian Bigelow, Nancy Lorimer, and Jeremy Nelson for their contributions to the presentation slides.

Outline

- Background
  - Charge
  - Governance
  - Potential Work
  - Subgroups

- Data exchange test and lessons learned

- Overview of 2025 Work Plan (draft)

- Q&A

Background

What is BIG??

The

BIBFRAME

Interoperability

Group

- *established by the Program for Cooperative Cataloging Policy Committee (PCC PoCo) to address interoperability issues in BF internationally*

- *full members include:*
    - *Cornell University*
    - *Index Data*
    - *Library of Congress*
    - *National Library of Sweden*
    - *National Library of Finland*
    - *OCLC*
    - *PCC*
    - *Share-VDE*
    - *Linked Data for Production/Sinopia*
    - *Stanford University*
    - *University of Alberta*
    - *University of California, Davis*
    - *University of Pennsylvania*

BIG Terms of Reference--Charge

Work collaboratively on the development and maintenance of interoperable BIBFRAME data guidelines to support production level implementation, to address issues restricting interoperability, and to inform development of associated toolings and infrastructure. It is not responsible for further development of the BIBFRAME ontology itself.

While members may use open and/or proprietary tools to support BIBFRAME data creation and exchange locally, this group is primarily focused on interoperability for unrestricted metadata reuse.

BIG Terms of Reference--Governance

- Chairs:
    - Past Chair: Ian Bigelow (University of Alberta)
    - Current Chair: Xiaoli Li (University of California, Davis)
    - Incoming Chair: Kalli Mathios (Stanford University)

- Terms of reference state:
  "Initially the group reports to PCC PoCo on its activities until it is functioning independently. PoCo will provide a mechanism for wider oversight and transparency, to leverage the expertise of other PCC groups as needed, and to coordinate with LC until such time as its functioning as an independent body. After an initial period pending a decision by BIG and PoCo approval, the group will operate as a standalone international group, developing new governance guidelines as needed."

    - originally, BIG was given 2 years to operate as a standalone group; in April 2024, this deadline was extended at the request of BIG

BIG Terms of Reference--Possible Work

- *Define a standard BIBFRAME "shape" to support data reuse including conversion to and from other formats*
- *Explore defining core BIBFRAME elements necessary for data exchange*
- *Surface issues regarding the use of the Official RDA with BIBFRAME and propose strategies for their resolution*
- *Collaborate and communicate with other groups working in the area of BF interoperability to ensure the ability to reuse BIBFRAME created in one community in other BIBFRAME stores*
- *Examine the work accomplished by the Communication Working Group and apply to this charge where appropriate*
- *Gather use cases as necessary to inform decision making, expanding on the efforts of the Use Case Working Group and others*
- *Provide an avenue for other interested parties to contact the BIBFRAME Interoperability Group and/or reach out to other stakeholders*

Subgroups

- BIBFRAME Interlingua Group
  - developing shape guidelines for validation of a base BF descriptions (aka "BF Interlingua")
    - properties
    - shapes of subgraphs
    - violation levels

- DCTAP/SHACL Group
  - developing the validation structure
    - structure of spreadsheet for DCTap
    - DCTap to SHaCL conversion

DCTAP = Dublin Core Tabular Application Profiles
SHACL = Shapes Constraints Language

BIBFRAME Data Exchange Test and Lessons learned

Google Sheets used to construct DCTAP

BIG DCTAP-to-SHACL Validation

Clicking on the Validation tab, a user can validate BIBFRAME RDF based on the SHACL graph by:

- Entering a URL
- Uploading a RDF file

Violations and Warnings based on the DCTAP rules will be displayed to the user

Test Objectives

- **Test the BIBFRAME Interoperability Validation tool**
  - Identify issues and provide feedback to enhance tool functionality
  - Evaluate SHACL validation using BIG member data
  - Identify changes needed to application profiles and DCTAP/SHACL
  - Incorporate needed changes into BIG work plan for 2025

Testing Scope

- BIBFRAME model:
    - Work and Instance only (Including administrative metadata)
- Resource formats:
    - Monographs (print and electronic)
    - Serials (print and electronic)
- Data formats:
    - BF descriptions converted from MARC
    - BF descriptions created natively

Thursday March 06, 2025

BIBFRAME Interoperability Validation Tool

118 triples from 5 SHACL Resources

Validation | SHACL Summary | **DCTAP** | More ▾

DCTAP Support

Experimental! Upload a BIBFRAME DCTAP tsv (tab-separated) file that is converted to SHACL and validate against the RDF graph

Upload TSV [Choose File] Monograph..._Text (2).tsv   ☐ Add to existing SHACL graph [Load DCTAP]

Resulting SHACL

```
@prefix bf: <http://id.loc.gov/ontologies/bibframe/> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix sh: <http://www.w3.org/ns/shacl#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

<big:Monograph:Work> a sh:NodeShape ;
    rdfs:label "Work (Monograph) Text" ;
    sh:property [ a sh:PropertyShape ;
            rdfs:label "Content Type" ;
            sh:minCount 1 ;
            sh:path bf:content ;
            sh:severity sh:Violation ],
        [ a sh:PropertyShape ;
            rdfs:label "Classification numbers" ;
            sh:minCount 1 ;
            sh:path bf:classification ;
            sh:severity sh:Warning ],
        [ a sh:PropertyShape ;
            rdfs:label "Contribution" ;
            sh:minCount 1 ;
            sh:node <big:Contribution> ;
            sh:path bf:contribution ;
            sh:severity sh:Warning ],
        [ a sh:PropertyShape ;
            rdfs:label "Form/Genre of Work" ;
            sh:minCount 1 ;
```

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Validation | **SHACL Summary** | DCTAP | More ▾

SHACL Summary

Shape Name	Target Class(es)	Properties
Agent	http://id.loc.gov/ontologies/bibframe/Agent http://id.loc.gov/ontologies/bibframe/Person http://id.loc.gov/ontologies/bibframe/Family http://id.loc.gov/ontologies/bibframe/Organization http://id.loc.gov/ontologies/bibframe/Jurisdiction http://id.loc.gov/ontologies/bibframe/Meeting	• path: http://www.w3.org/2000/01/rdf-schema#label • minimum count: 1
Contribution	http://id.loc.gov/ontologies/bibframe/Contribution http://id.loc.gov/ontologies/bibframe/PrimaryContribution	• path: http://id.loc.gov/ontologies/bibframe/agent • minimum count: 1 • path: http://id.loc.gov/ontologies/bibframe/role • minimum count: 1
Monograph Title	http://id.loc.gov/ontologies/bibframe/Title	• path: http://id.loc.gov/ontologies/bibframe/mainTitle • minimum count: 1
Role	http://id.loc.gov/ontologies/bibframe/Role	• path: http://www.w3.org/2000/01/rdf-schema#label • minimum count: 1

BIBFRAME Interoperability Validation Tool

118 triples from 5 SHACL Resources

Validation SHACL Summary DCTAP More ▼

Enter URL(s) or upload Source RDF

Separate multiple urls with a comma. Supports Turtle, RDF/XML, JSON-LD, N-Triples, Notation-3 formats based on rdflib.util.guess_format.

`https://api.stage.sinopia.io/resource/941152c3-f7fd-419f-8b1a-89b8f2737dae`   Choose File No file chosen   **Validate RDF**

https://api.stage.sinopia.io/resource/941152c3-f7fd-419f-8b1a-89b8f2737dae with 45 triples Passed!!

```
Validation Report
Conforms: True
Results (2):
Validation Result in MinCountConstraintComponent (http://www.w3.or
        Severity: sh:Warning
        Source Shape: [ rdf:type sh:PropertyShape ; rdfs:label Lit
        Focus Node: <https://api.stage.sinopia.io/resource/941152c
        Result Path: bf:genreForm
        Message: Less than 1 values on <https://api.stage.sinopia.
Validation Result in MinCountConstraintComponent (http://www.w3.or
        Severity: sh:Warning
        Source Shape: [ rdf:type sh:PropertyShape ; rdfs:label Lit
        Focus Node: <https://api.stage.sinopia.io/resource/941152c
        Result Path: bf:classification
        Message: Less than 1 values on <https://api.stage.sinopia.
```

https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3 with 41 triples Failed!!

```
Validation Report
Conforms: False
Results (4):
Validation Result in MinCountConstraintComponent (http://www.w3.org/ns/shacl#MinCountConstraintComponent):
        Severity: sh:Warning
        Source Shape: [ rdf:type sh:PropertyShape ; rdfs:label Literal("Place of Origin of the Work") ; sh:maxCount Literal("1", datatype=xsd:integer) ; sh:minCount Literal("1", datatype=xsd:integ
        Focus Node: <https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3>
        Result Path: bf:originPlace
        Message: Less than 1 values on <https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3>-->bf:originPlace
Constraint Violation in MinCountConstraintComponent (http://www.w3.org/ns/shacl#MinCountConstraintComponent):
        Severity: sh:Violation
        Source Shape: [ rdf:type sh:PropertyShape ; rdfs:label Literal("Language") ; sh:minCount Literal("1", datatype=xsd:integer) ; sh:path bf:language ; sh:severity sh:Violation ]
        Focus Node: <https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3>
        Result Path: bf:language
        Message: Less than 1 values on <https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3>-->bf:language
Validation Result in MinCountConstraintComponent (http://www.w3.org/ns/shacl#MinCountConstraintComponent):
        Severity: sh:Warning
        Source Shape: [ rdf:type sh:PropertyShape ; rdfs:label Literal("Subject of the Work") ; sh:minCount Literal("1", datatype=xsd:integer) ; sh:path bf:subject ; sh:severity sh:Warning ]
        Focus Node: <https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3>
        Result Path: bf:subject
        Message: Less than 1 values on <https://api.stage.sinopia.io/resource/4748e161-2842-4a52-b0d6-aaa7151cb9c3>-->bf:subject
Validation Result in MinCountConstraintComponent (http://www.w3.org/ns/shacl#MinCountConstraintComponent):
        Severity: sh:Warning
```

Results

- Documentation for the BIBFRAME Interoperability Validation tool created to assist with testing
- 7 BIG member institutions were able to participate in testing
- Few changes and updates needed to the validation tool
- Most data met validation requirements for monograph and serial shapes with few violations
- Testing exposed new data model and interoperability issues for continued work

Issues Reported

Tool related
Enhancing the display of shape warnings and violations

Data model and validation issues surfaced in testing

- At times, cataloging practices and the SHACL validation rules are misaligned
- SHACL rules need to be adjusted to align with extension documentation, such as BFLC
- BIBFRAME created through MARC conversion receives different SHACL errors than non-converted BIBFRAME data, and the SHACL needs to validate both
- SHACL shape for adminMetadata needs reconsideration

Challenges Surfaced

- BIBFRAME is still evolving
- Hybrid MARC and BIBFRAME workflows
- Rates of change for MARC to BF converters and the BF ontology
- Need for a common and efficient workflow utilizing the SHACL validator
- Management of BIBFRAME extensions, and the local application of additional ontologies (e.g., LRM/RDA-RDF)
- Differences in the application of BIBFRAME produce complications for data interoperability, even if passing validation and producing valid RDF

2025 Work Plan (Draft)

Areas of BIG will focus in 2025

Validation and Refinement

- Analyze test results for textual monographs and serials and refine Interlingual profiles and improve DCTap/SHACL validation tools

Element Identification and Shape Development

- Identify core elements for non-textual materials, such as sound recording, videorecording, musical, cartographic, etc.
- Develop shapes/recommendations for properties beyond the required core elements

Major Areas of BIG will focus in 2025

Model Expansion

- Expand beyond bf:Work and bf:Instance to higher-level aggregation/clustering approaches, e.g., bf:Hub and svde:Opus
- Expand beyond BIBFRAME and bflc by developing recommendations for BIBFRAME extensions

Data Exchange and Collaboration

- Gather and consolidate feedback on BIBFRAME data reuse
- Strengthen communications and promote the group's work

Resources

- BIG Wiki Page: https://wiki.lyrasis.org/pages/viewpage.action?pageId=249135298

- BIG Github: https://github.com/bf-interop
- BIBFRAME Interoperability Validation Tool: https://bf-interop.github.io/bf-demo-validation-tool

- Group's email: bf-interop@googlegroups.com

Thank you!

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