Modelling sequential relationships beyond MARC 21

Mapping preceding and succeeding entity relationships for Continuing Resources

Bibliographic Conceptual Models Interest Group, March 10th, 2022

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CONTEXT

Share-VDE (Virtual Discovery Environment) & the Sapientia Cluster Knowledgebase

▷ "Share-VDE pulls together MARC authority and bibliographic data from 26 member libraries, enriches it with authoritative entities and clusters data into BIBFRAME entities", the result is the **Sapientia Cluster Knowledgebase**[1]

Sapientia Entity Identification Working Group (SEIWG)

▷ Review use of entities, identifiers, and associated modelling in Sapientia

▷ Review and refine processes for Sapientia entity clustering

▷ Review MARC to BIBFRAME and BIBFRAME to MARC conversion of elements related to Sapientia entities[2]

CONTEXT

The Share-VDE 2.0 roadmap for late 2021 and early 2022 included:

▷ Discovery: Search Interface and Search APIs
▷ **Cluster Knowledge Base 2.0 refactoring**
▷ J.Cricket Cluster Knowledge Base editor release
▷ Testing of authority services
▷ Ongoing updates of the PCC data pool
▷ Ongoing work on Sinopia/QA interaction

SEIWG Project: As part of a wider review of entity identification in advance of the CKB 2.0 refactoring, defining BIBFRAME entity creation and relationship management rules for the MARC 21 Bibliographic linking fields (76X-78X)

STORED | HISTORY

Search Stored Queries ...

Share-VDE_C...

Untitled-1

Run | Show Plan | Reasoning | Share-VDE_prod | Save to File | Store Query

```
1  select *
2    { graph ?g {
3        <http://share-vde.org/sharevde/rdfBibframe/Work/14460501> ?p ?o .
4        ?o rdfs:label ?t
5      }
6    }
```

Run to File | Text | Charts | Visualize   40 Results, 1085 ms

g	p	o	t
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/PRINCE...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/UMICH...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/UALBER...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/COLOR...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/UALBER...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/STANFO...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/TAMU4...	http://id.loc.gov/ontologies/bibframe/title	http://share-vde.org/sharevde/rdfBibframe/Title_996/56ca47ef-1...	" Woman citizen"
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/2eb5a070...	"Women--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/3bbbc848...	"Women--Suffrage--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/note	http://share-vde.org/sharevde/rdfBibframe/Note/8d2cbaa6-27fe...	"Formed by the union of: Woman voter (New York, N.Y. : 1910), a...
http://share-vde.org/sharevde/rdfBibframe/Provenance/UMICH...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/4be120e4...	"Women--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/UMICH...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/652cdb0a...	"Women--Suffrage--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/UMICH...	http://id.loc.gov/ontologies/bibframe/note	http://share-vde.org/sharevde/rdfBibframe/Note/c24e7643-cd9...	"Formed by the union of: Woman voter, National suffrage news, ...
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/03a1830c...	"Women--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/ac119a93...	"Women--Suffrage--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/DUKE00...	http://id.loc.gov/ontologies/bibframe/note	http://share-vde.org/sharevde/rdfBibframe/Note/e1251a33-21e...	"Formed by the union of: Woman voter (New York, N.Y. : 1910), a...
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/04241fa4-...	"Women--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/14be5d14...	"Women--Suffrage--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/note	http://share-vde.org/sharevde/rdfBibframe/Note/b2b80b85-837...	"Formed by the union of: Woman voter, National suffrage news, ...
http://share-vde.org/sharevde/rdfBibframe/Provenance/UALBER...	http://id.loc.gov/ontologies/bibframe/relatedTo	http://share-vde.org/sharevde/rdfBibframe/Work/8427016a-742...	"The woman's journal."
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/b009d10f...	"Women--Suffrage--Periodicals."
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/subject	http://share-vde.org/sharevde/rdfBibframe/Topic_650/94a0297f-...	"Women--Suffrage."
http://share-vde.org/sharevde/rdfBibframe/Provenance/HARVA...	http://id.loc.gov/ontologies/bibframe/note	http://share-vde.org/sharevde/rdfBibframe/Note/f77067d2-2f53...	"Formed by the union of: Woman's journal (Boston, Mass. : 1917...

Leverage linked data's ability to clearly express relationships between entities and to encode these relationships more explicitly for machines, users, and catalogers

"

Approach

- ▷ Map to bf relationships where possible and appropriate
- ▷ Where gaps exist
  - ► Utilize relationships from RDA/RDF where suitable and available in order to enrich the data
  - ► Where no suitable alternative exists, decide whether the loss of information is acceptable, or whether a new bf relationship should be established
- ▷ Where complexity exists in the source (MARC data), apply logic that can support additional code development to identify the appropriate relationship where possible

Successes

Many 780/785 relationships can currently be mapped to BIBFRAME without a loss of information

SUCCESSFULLY MAPPED 780/785 RELATIONSHIPS

| Tag	1-2 Indicator	MARC tag/indicator	BIBFRAME conversion specs
780		**PRECEDING ENTRY**	If no valid value in ind2 then W - precededBy
780	2° = 0	Preceding Entry / Continues	W - continues
780	2° = 1	Preceding Entry / Continues in part	W - continuesInPart
780	2° = 5	Preceding Entry / Absorbed	W - absorbed
780	2° = 7	Preceding Entry / Separated from	W - separatedFrom
785		**SUCCEEDING ENTRY**	If no valid value in Ind2 then W - succeededBy
785	2° = 0	Succeeding Entry / Continued by	W - continuedBy
785	2° = 1	Succeeding Entry / Continued in part by	W - continuedInPartBy
785	2° = 4	Succeeding Entry / Absorbed by	W - absorbedBy

Mapped Relationships

Example: 785 00 (Continued by)

022 0# $a 0730-5567 $l 0730-5567 $2 1

245 00 $a Preliminary seismological bulletin / $c Tennessee Earthquake Information Center, Memphis State University.

260 ## $a Memphis, Tenn. : $b The Center, $c -1982.

785 00 $t **TEIC quarterly seismological bulletin** $x 0741-1898
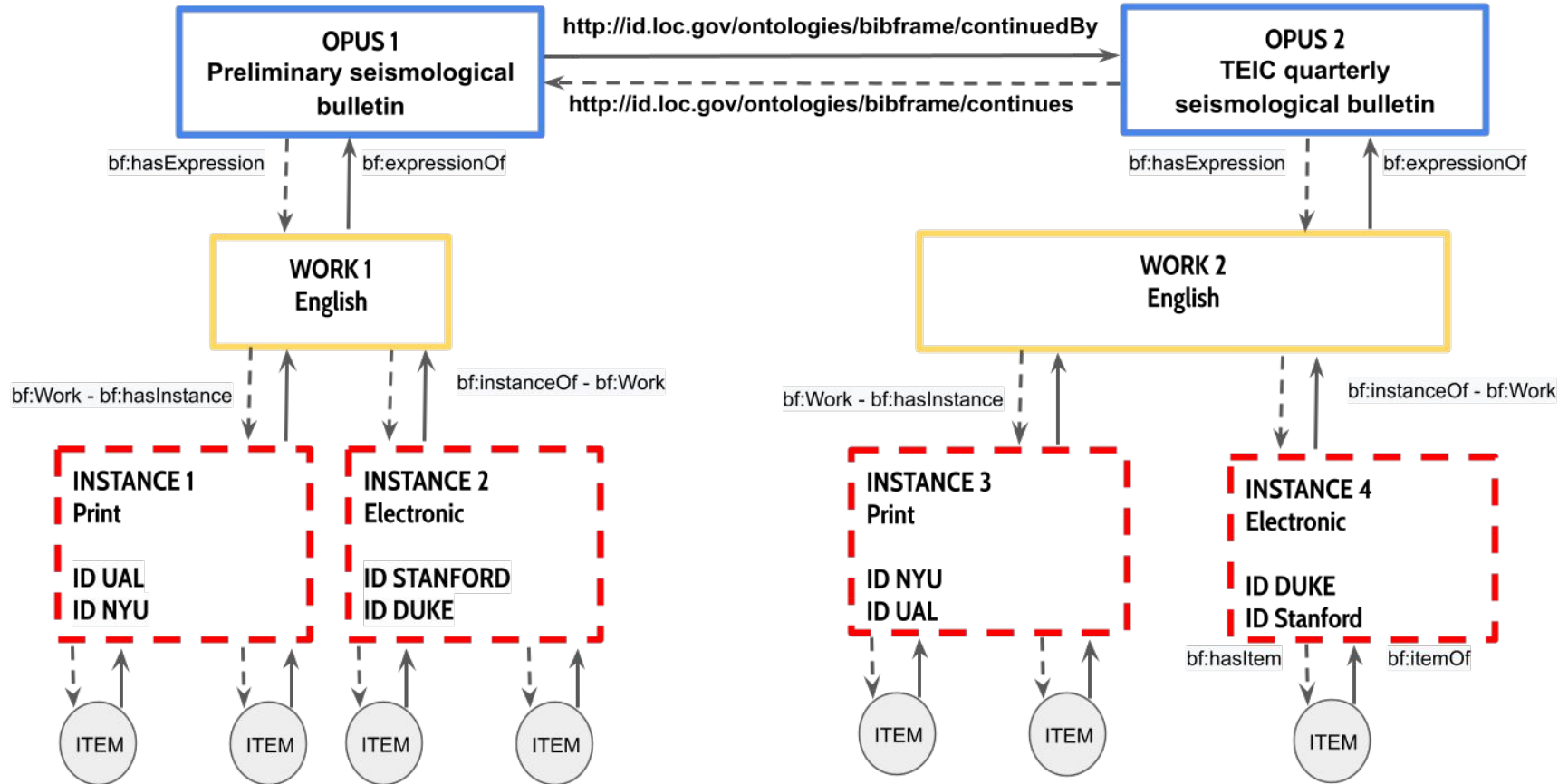
Challenges

▷ Capturing complex relationships:

- ▶ One-to-many relationships
- ▶ Lateral relationships

▷ Capturing sequential relationship data beyond 780/785 (e.g., 247 field, 580 notes, etc.)

CAPTURING COMPLEX RELATIONSHIPS

One-to-many Relationships

Example: 785 05 (Absorbed in part by)

022 0# $a 2691-526X $2 1

245 04 $a The Metal worker, plumber, and steam fitter.
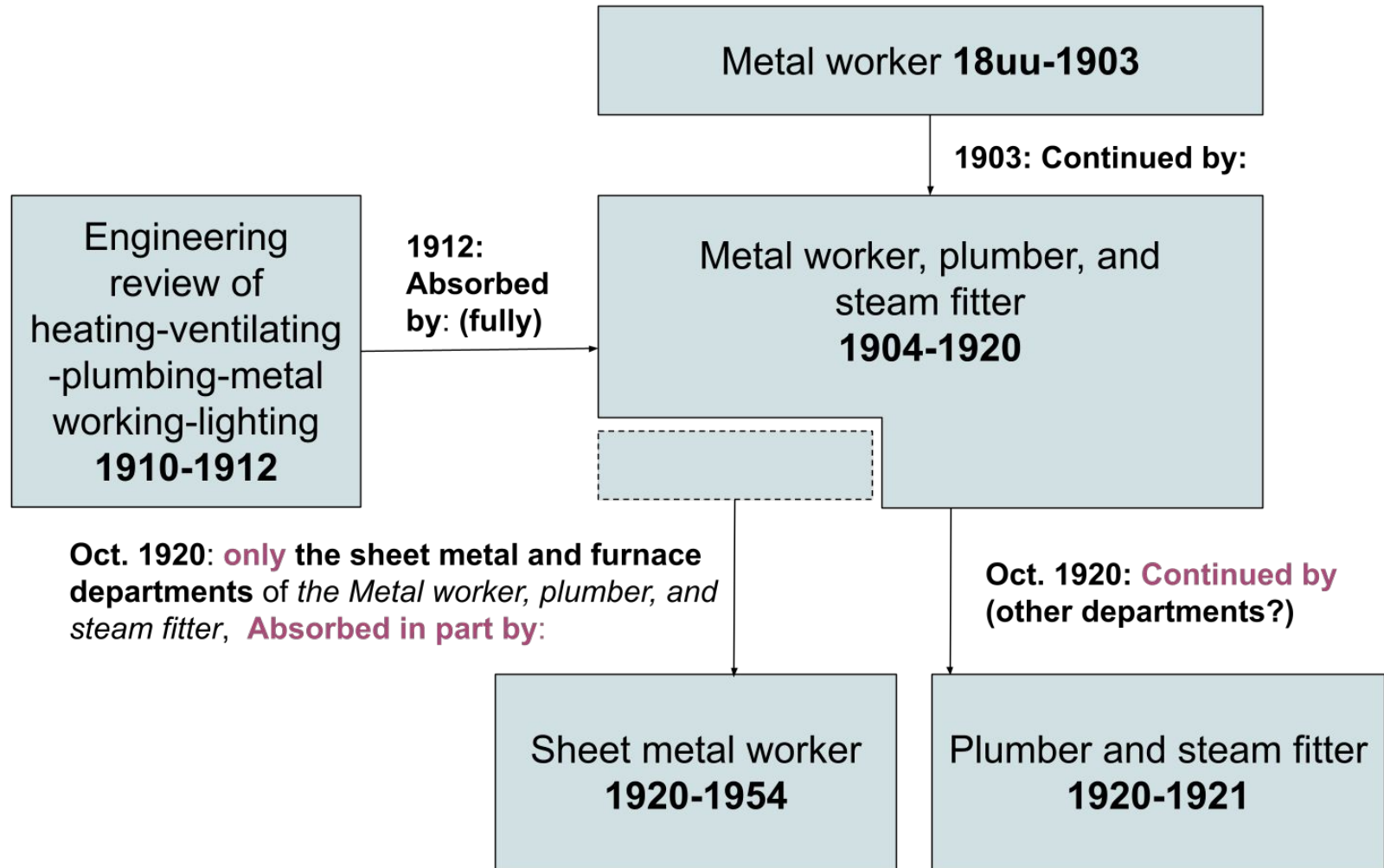
780 00 $t Metal worker $x 2691-5898

780 05 $t Engineering review of heating-ventilating-plumbing-metal working-lighting $g Oct. 1912 $x 2691-5235

785 00 $t Plumber and steam fitter $x 2691-5588

785 0**5** $t **Sheet metal worker** $x 0096-9249

Note: No 580 note in the Bib record; _Sheet metal worker_ absorbed _the **sheet metal and furnace departments** of the Metal worker, plumber, and steam fitter_, Oct. 1920. ⇨ This is an "absorbed in part" relationship ; that is, both publications continued on following this Bib absorption event in Oct. 1920.

Metal worker **18uu-1903**

1903: Continued by:

Engineering review of heating-ventilating-plumbing-metal working-lighting **1910-1912**

1912: Absorbed by: (fully)

Metal worker, plumber, and steam fitter **1904-1920**

Oct. 1920: **only** the sheet metal and furnace departments of *the Metal worker, plumber, and steam fitter*, **Absorbed in part by**:

Oct. 1920: Continued by (other departments?)

Sheet metal worker **1920-1954**

Plumber and steam fitter **1920-1921**

CAPTURING COMPLEX RELATIONSHIPS

Many-to-one Relationships
… 580 Notes & Lateral Relationships

Example: 785 17 (Merged with … to form…):

022 0# $a **0226-0883** $l 0226-0883 $2 4

110 1# $a British Columbia. $b Ministry of Provincial Secretary and Government Services.
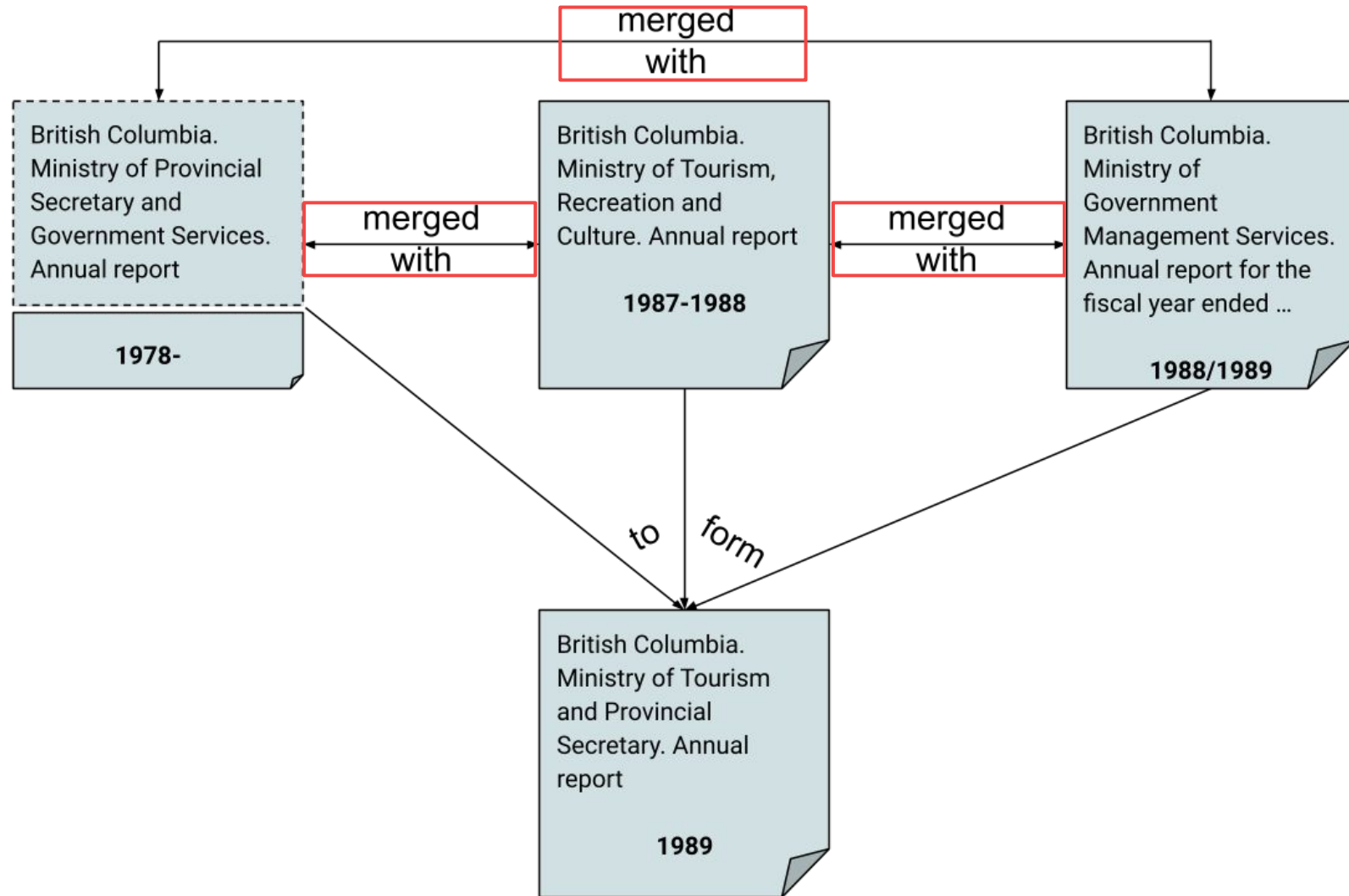
➡ **245** 10 $a Annual report - Ministry of Provincial Secretary and Government Services.

580 $a Part of this title **merged with**: British Columbia. Ministry of Tourism, Recreation and Culture. Annual report, ISSN 0843-8080; and: British Columbia. Ministry of Government Management Services. Annual report for the fiscal year ended ... **to become**: British Columbia. Ministry of Tourism and Provincial Secretary. Annual report, ISSN 0847-4710.

➡ **785** 17 $a British Columbia. Ministry of Government Management Services. $t Annual report for the fiscal year ended ... $x 0847-4281

➡ **785** 17 $a British Columbia. Ministry of Tourism, Recreation, and Culture. $t Annual report $x 0843-8080

785 17 $a British Columbia. Ministry of Tourism and Provincial Secretary. $t Annual report $x 0847-4710

merged with

British Columbia. Ministry of Provincial Secretary and Government Services. Annual report

1978-

merged with

British Columbia. Ministry of Tourism, Recreation and Culture. Annual report

1987-1988

merged with

British Columbia. Ministry of Government Management Services. Annual report for the fiscal year ended …

1988/1989

to form

British Columbia. Ministry of Tourism and Provincial Secretary. Annual report

1989

CAPTURING SEQUENTIAL RELATIONSHIP DATA BEYOND 780/785

Legacy Data: Former titles

Example: A hybrid record with both latest and successive entries (i.e., Previous title entities encoded in both 780 AND 247 fields)

S/L = 1   BibLvl = s

245 04 $a The Holston messenger.

247 00 $a **Holston conference messenger**. ‡f Vol. 1, no. 1-no. 19? no

247 00 $a **Messenger for the Holston conference**. ‡f Vol. 1, no. 20? - v.2, no. 47?

260 00 $a Knoxville, Tenn. : ‡b T. Springfield, ‡c 1827-29?

780 **02** $t Western Arminian, and Christian instructor.

Western Arminian, and Christian instructor, 1824-uuuu

Continued by:

Holston conference messenger. v.1, no.1 (1827)-v.1, no.18 (1827)

Continued by:

Messenger for the Holston conference. v.1, no.19 (May 13, 1827)-v. 2, no.52 (Dec. 29, 1827).

Continued by:

The Holston messenger. v.3 (1828)-v.4, no.11 (1829)
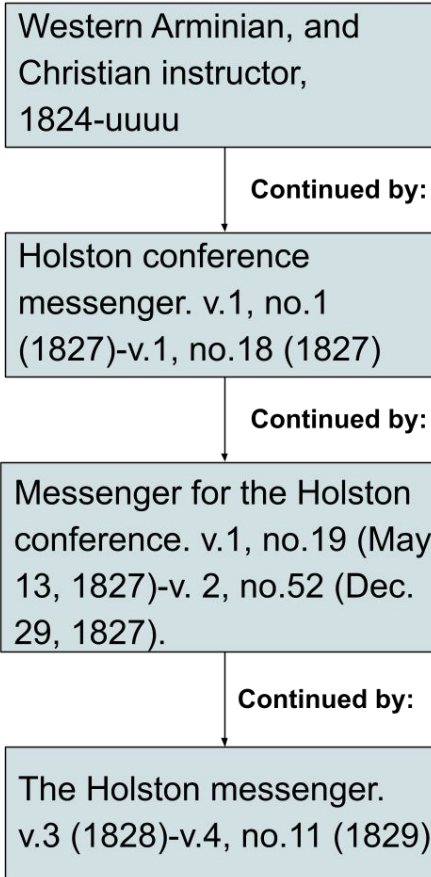
CAPTURING SEQUENTIAL RELATIONSHIP DATA BEYOND 780/785

Legacy data: "Changed back to"
A former *title* vs. a former *entity*

▷ BIBFRAME Specs mapped 785 08 (Changed back to) to *ContinuedBy*
  ▸ We found some records *changed back to* multiple entities (former titles)
  ▸ Recommendation:
    ◆ Mapping includes *Continued in part by*?
▷ Legacy records with "Changed back to": some converted into indicator 0 or 1 and some still using indicator 8
  ▸ Fail to comply with the WEM-lock
  ▸ Recommendation:
    ◆ Stop using "Changed back to" for new descriptions

Interoperability & context for next steps

The relationships we are able to extract programmatically from MARC are not necessarily the same as what we might hope to achieve with native BIBFRAME cataloguing

Modelling choices and Interoperability: MARC2BF vs Sinopia

780 - PRECEDING ENTRY (R)	If no valid value in ind2 then W - precededBy
Indicators	
Second - Type of relationship	
0 - Continues	W - continues
1 - Continues in part	W - continuesInPart
2 - Supersedes	W - precededBy ★
3 - Supersedes in part	W - precededBy ★
4 - Formed by the union of ... and ...	W - mergerOf ★
5 - Absorbed	W - absorbed
6 - Absorbed in part	W - absorbed ★
7 - Separated from	W - separatedFrom

Related Work ↗

Related Work (Serial)

Property: http://id.loc.gov/ontologies/bflc/relationship
Class: http://id.loc.gov/ontologies/bflc/Relationship

+ Add **Search related works**

+ Add **Relationship Designator**

+ Add **Absorbed (work):** ↗

+ Add **Continues (work):** ↗

+ Add **Continues in part (work):** ↗

+ Add **Merger of (work):** ↗

+ Add **Separated from (work):** ↗

+ Add **Continued by (work):** ↗

+ Add **Absorbed by (work):** ↗

+ Add **Continued in part by (work):** ↗

+ Add **Merged to form (work):** ↗

+ Add **Split into (work):** ↗

+ Add **Has supplement (work):**

+ Add **Supplement to (work):**

+ Add **Description of Related Work**

NEXT STEPS

Define Specifications

Work with Share-VDE developers to implement relationship assignments and define creation logic where 1-1 relationships aren't present

Iterative Improvements

Review updated dataset, identifying new issues or areas requiring improvements; work with Share-VDE to implement improvements

Ontology Updates

Advocate for ontology development for BIBFRAME along with updates to conversion specifications

Further Investigation

Further analysis of the use of RDA Unconstrained properties along with BIBFRAME as needed

THANK YOU!

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CREDITS

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