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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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 Knowledgebase¹

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 entities²
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)
```sql
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT *
WHERE {
  ?o rdfs:label "it"
}
```
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

<table>
<thead>
<tr>
<th>Tag</th>
<th>1-2 Indicator</th>
<th>MARC tag/indicator</th>
<th>BIBFRAME conversion specs</th>
</tr>
</thead>
<tbody>
<tr>
<td>780</td>
<td>2° = 0</td>
<td>Preceding Entry / Continues</td>
<td>W - continues</td>
</tr>
<tr>
<td>780</td>
<td>2° = 1</td>
<td>Preceding Entry / Continues in part</td>
<td>W - continuesInPart</td>
</tr>
<tr>
<td>780</td>
<td>2° = 5</td>
<td>Preceding Entry / Absorbed</td>
<td>W - absorbed</td>
</tr>
<tr>
<td>780</td>
<td>2° = 7</td>
<td>Preceding Entry / Separated from</td>
<td>W - separatedFrom</td>
</tr>
<tr>
<td>785</td>
<td>2° = 0</td>
<td>Succeeding Entry / Continued by</td>
<td>W - continuedBy</td>
</tr>
<tr>
<td>785</td>
<td>2° = 1</td>
<td>Succeeding Entry / Continued in part by</td>
<td>W - continuedInPartBy</td>
</tr>
<tr>
<td>785</td>
<td>2° = 4</td>
<td>Succeeding Entry / Absorbed by</td>
<td>W - absorbedBy</td>
</tr>
</tbody>
</table>
CAPTURING 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 05 $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:

Metal worker, plumber, and steam fitter 1904-1920

1912: Absorbed by: (fully)

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

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

Sheet metal worker 1920-1954

Plumber and steam fitter 1920-1921

Oct. 1920: Continued by (other departments?)
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.


→ 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
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

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. ǂf Vol. 1, no. 1-no. 19? no
247 00 $a Messenger for the Holston conference. ǂf Vol. 1, no. 20? - v.2, no. 47?
260 00 $a Knoxville, Tenn. : ǂb T. Springfield, ǂc 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)
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

<table>
<thead>
<tr>
<th>780 - PRECEDING ENTRY (R)</th>
<th>If no valid value in ind2 then W - precededBy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
<td></td>
</tr>
<tr>
<td>Second - Type of relationship</td>
<td></td>
</tr>
<tr>
<td>0 - Continues</td>
<td>W - continues</td>
</tr>
<tr>
<td>1 - Continues in part</td>
<td>W - continuesInPart</td>
</tr>
<tr>
<td>2 - Supersedes</td>
<td>W - precededBy ★</td>
</tr>
<tr>
<td>3 - Supersedes in part</td>
<td>W - precededBy ★</td>
</tr>
<tr>
<td>4 - Formed by the union of ... and ...</td>
<td>W - mergerOf ★</td>
</tr>
<tr>
<td>5 - Absorbed</td>
<td>W - absorbed</td>
</tr>
<tr>
<td>6 - Absorbed in part</td>
<td>W - absorbed ★</td>
</tr>
<tr>
<td>7 - Separated from</td>
<td>W - separatedFrom</td>
</tr>
</tbody>
</table>
## NEXT STEPS

<table>
<thead>
<tr>
<th>Define Specifications</th>
<th>Iterative Improvements</th>
<th>Ontology Updates</th>
<th>Further Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work with Share-VDE developers to implement relationship assignments and define creation logic where 1-1 relationships aren’t present</td>
<td>Review updated dataset, identifying new issues or areas requiring improvements; work with Share-VDE to implement improvements</td>
<td>Advocate for ontology development for BIBFRAME along with updates to conversion specifications</td>
<td>Further analysis of the use of RDA Unconstrained properties along with BIBFRAME as needed</td>
</tr>
</tbody>
</table>
CREDITS

- With many thanks to others working on this on the SEIWG!
- Presentation template by SlidesCarnival