



Exploiting Musical Connections: A Proposal for Support of Work Relationships in a Digital Music Library

Jenn Riley

Metadata Librarian

Indiana University Digital Library Program

Academic music libraries

- Faculty and students need materials for performance and research
- Materials increasingly digital
- Heavy emphasis on known-item searching
- But support for exploration to discover previously unknown music is also important

Discovery of music in libraries

- The physical item is the basis of description
- Cataloging rules and record format not originally designed for music
- Cataloging practice does not take advantage of all possibilities of record format
- Some specific problems for music
 - Most often individual works on a multi-work item are not explicitly identified
 - Contributors not connected to individual works
 - Instrumentation not handled well

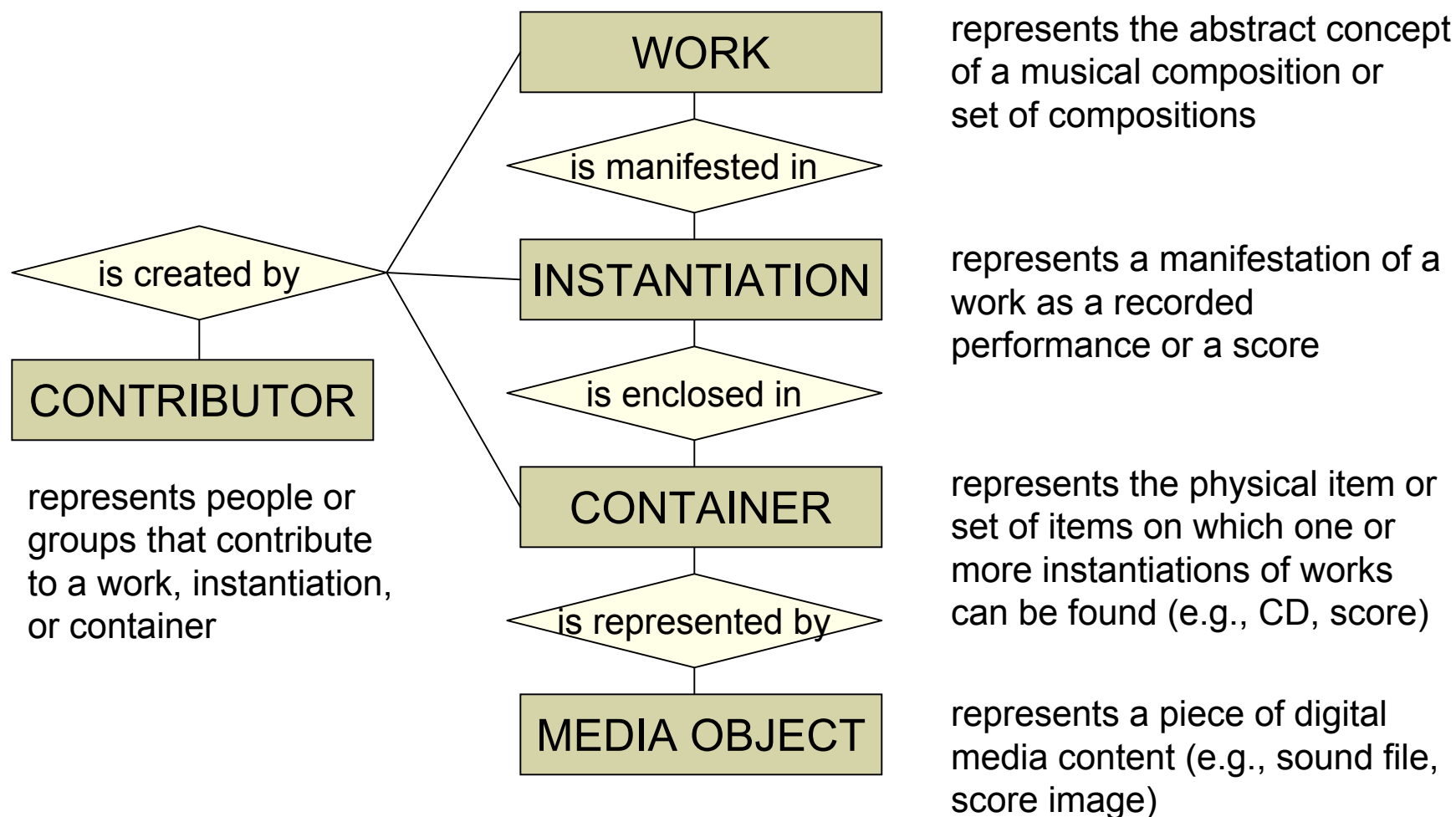
Variations2 @ Indiana University (1)

- Federally-funded multi-year, multi-million dollar project
- Digital music library testbed system
- Research areas
 - Copyright
 - Metadata
 - Music instruction & course management systems
 - Music theory instruction
 - Networking
 - System design
 - Usability

Variations2 @ Indiana University (2)

- Multiple formats represented
 - Audio
 - Scanned score images
 - Some encoded scores
- Metadata is human-generated, or mapped from other human-generated metadata
- Includes tools for using digital objects in instruction
- Work-centric metadata model matches well to music in the Western canon of art music

Variations2 metadata model



Work relationships

- Significant research into work relationships and bibliographic relationships
- Two relationships most frequent in music of the Western canon
 - Derivative relationship: between a source work and a derivative work based in some way on the source work
 - Whole-part relationship: between a parent work and a child work that is completely enclosed in the parent

Current Variations2 implementation

- Specified relationships
 - Four types
 - isVersionOf
 - hasVersion
 - isPartOf
 - hasPart
 - Not reciprocal
 - Doesn't *do* anything
 - Not immediately visible to end-users
- Hierarchical work structure

Need for something different

- “Parts” of works need multiple titles, keys, other properties of works
- Users access different parts of works for different needs
- Different versions of works have different structures, but users don’t know the difference between them

Our proposal

- Functional requirements for how to act on known relationships between works
- Covers derivative and whole-part relationships
- Defines system behavior for recording, maintaining, and using the relationship in retrieval

Derivative relationships: definition

- Between one source work and one derivative work
- Includes arrangements, versions, medleys, free interpretations
- Run from very strong to very weak
- Fully reciprocal
- Arbitrary number of derivatives per source, arbitrary number of sources per derivative
- Can occur simultaneously with whole/part relationship

Derivative relationships: query matching and display (1)

Source

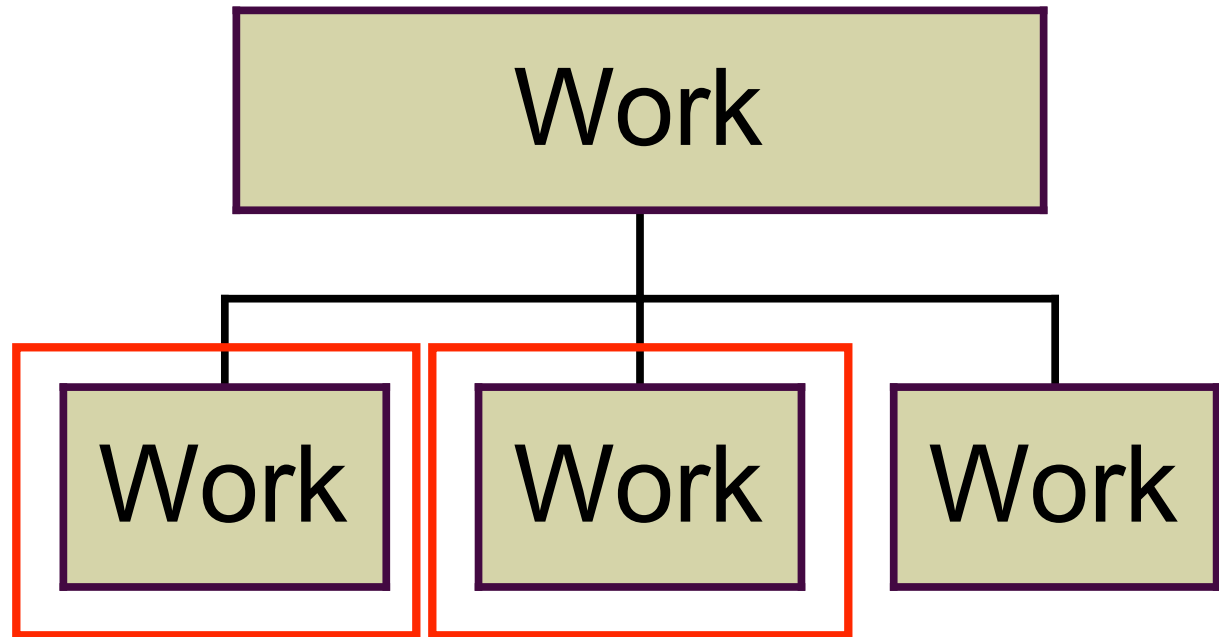
Work

Derivative

Work

Work

Work



Derivative relationships: query matching and display (2)

- Display derivative work together with its source

Query: copland and mexico and piano

Work title:	Salón México; arr.
Composer:	Copland, Aaron , 1900-1990
Instrumentation:	Piano
Derived from:	Salón México Copland, Aaron 1900-1990 Orchestra

- Need to display multiple results meaningfully

Derivative relationships: query matching and display (3)

Source

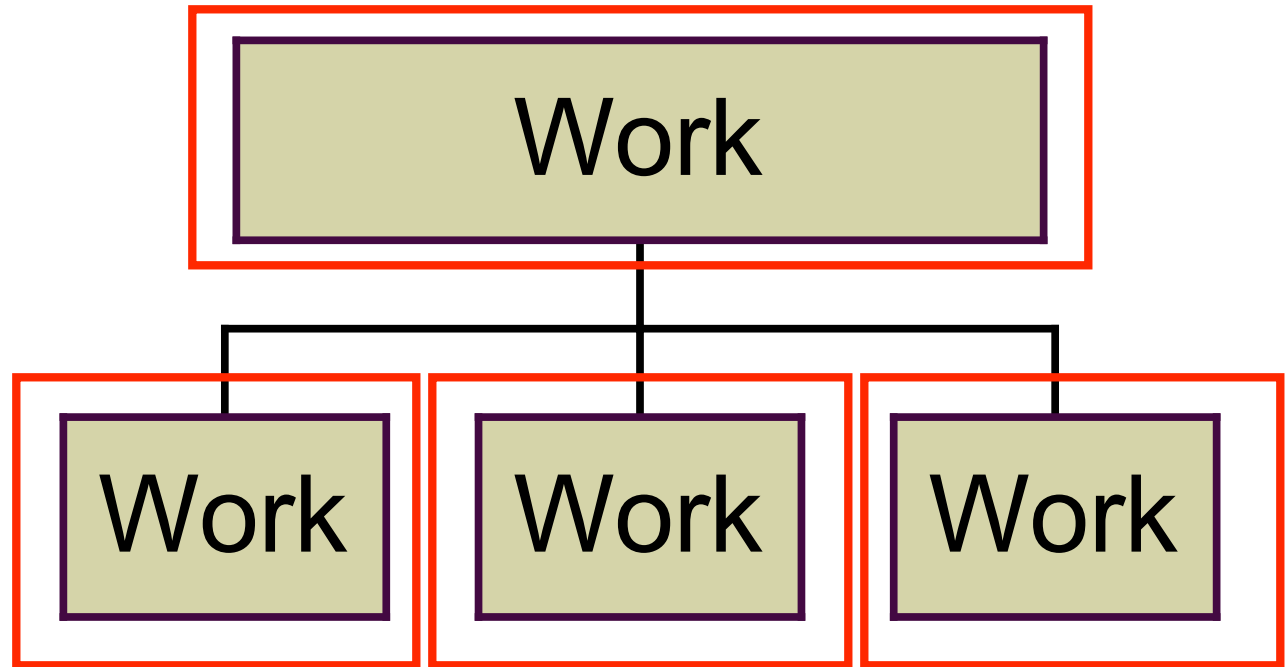
Work

Derivative

Work

Work

Work



Derivative relationships: query matching and display (4)

- Display source work in the result set
- Allow user to display all derivative works for that source

Query: bach and sonata and 1001

Work title: [Sonaten und Partiten, violin, BWV 1001-1006. Sonata, no. 1](#)

Composer: [Bach, Johann Sebastian](#) 1685-1750

Instrumentation: Violin

[View derivative works](#) (3)

Whole-part relationships: definition

- Between a parent work and a child work that is completely enclosed in the parent
- Parts are frequently performable units
- Fully reciprocal
- Arbitrary depth, but a child can have only one parent
- Can occur simultaneously with derivative relationship
- Child work not equivalent to a work structure node

Whole-part relationships: query matching and display (1)

Parent

Work

Child

Work

Work

Work

Whole-part relationships: query matching and display (2)

- Return as search results the children matched by the query plus their *immediate* parent works

Query: wagner and siegfried and nothung

Work title: Nothung! Nothung! Neidliches Schwert!

Composer: [Wagner, Richard](#) 1813-1883

Part of: [Ring des Nibelungen. Siegfried.](#)
[Wagner, Richard](#) 1813-1883

Whole-part relationships: query matching and display (3)

Parent

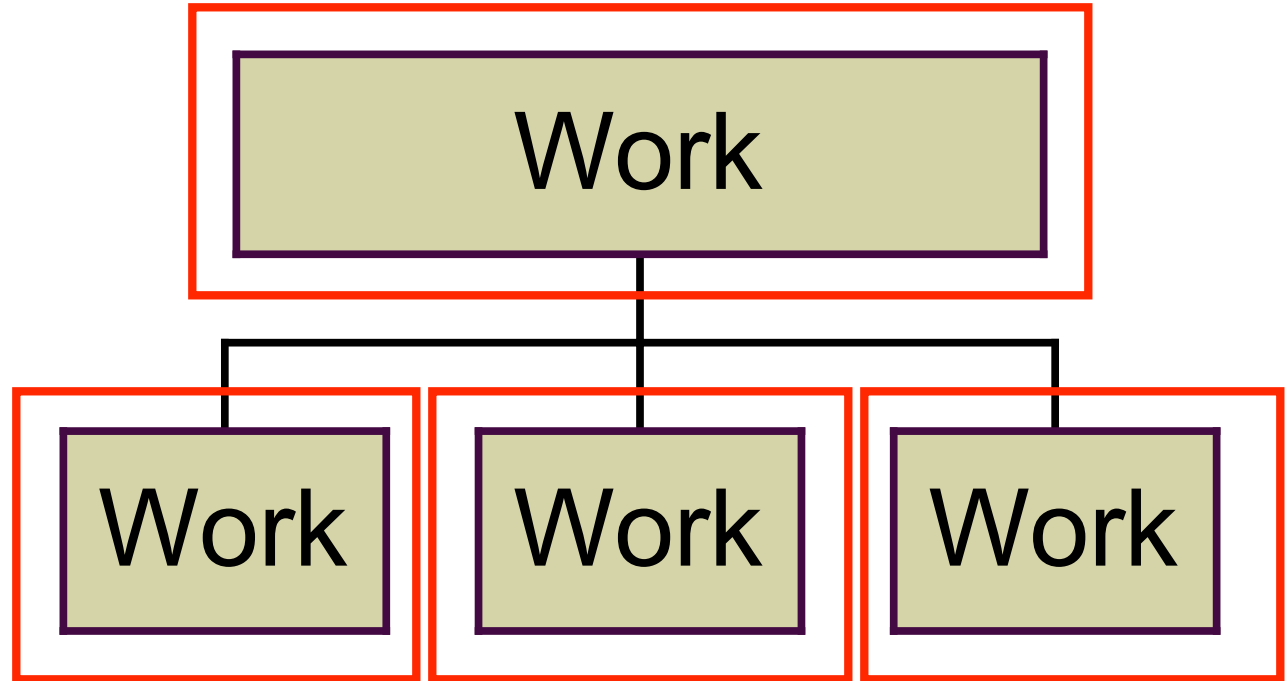
Work

Child

Work

Work

Work



Whole-part relationships: query matching and display (4)

- Consider the parent the match and display it together with its immediate parent
- After match, allow user to view complete hierarchy
- Matching rules require full Uniform Title to function properly

Next steps

- Actual implementation
- User testing
- Define “version” relationship
- Relationships for other types of materials

More information

- jenlrile@indiana.edu
- These presentation slides:
<http://www.dlib.indiana.edu/~jenlrile/presentations/ismir2005/>
- Variations2 Project Site:
<http://variations2.indiana.edu>