

# From conceptual model to implementations

User interfaces for search and exploration

# The purpose of models

- Models are tools to solve problems
  - Conceptual models are guides
  - Implementation models are descriptions
- In LRM, the purpose of the model is to support user tasks

**Table 3.1 User Tasks Summary**

Find	To bring together information about one or more resources of interest by searching on any relevant criteria
Identify	To clearly understand the nature of the resources found and to distinguish between similar resources
Select	To determine the suitability of the resources found, and to be enabled to either accept or reject specific resources
Obtain	To access the content of the resource
Explore	To discover resources using the relationships between them and thus place the resources in a context

...designed to be used in linked data environments and to support and promote the use of bibliographic data in linked data environments

# In contrast

- BIBFRAME has a primary focus on the traditional data exchange:
- *"A major focus of the initiative is 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."*

# Implementing conceptual models

- Coding data
  - Conceptual model as the foundation of formats and vocabularies
  - Does the model match our data, or make our data better
- Interoperability, exchange and reuse
  - Conceptual model as foundation for exchange and reuse
  - Within same domain vs. across domain
  - Easier to agree on the intention than the extension
  - Identity management
- Applications
  - Conceptual model as foundation for good user experience
  - Final test: do the model match or conflict with user's conceptualization

# How do we know the quality of a model?

- Conceptual models are expert-driven
  - Knowledge and expertise as main input
- Semantic quality
  - The model is a complete and correct representation of a domain, captures all relevant statements we need to express in a domain
- Pragmatic quality
  - The model can be understood by all actors that will use the model
- Maybe also need to consider "Application quality"?
  - Validating the model by implementing it
  - How does it perform on user tasks

Lindland et al. (1994)  
Understanding Quality  
in Conceptual Modeling.  
IEEE Software 11(2).

# Search interfaces and user behavior

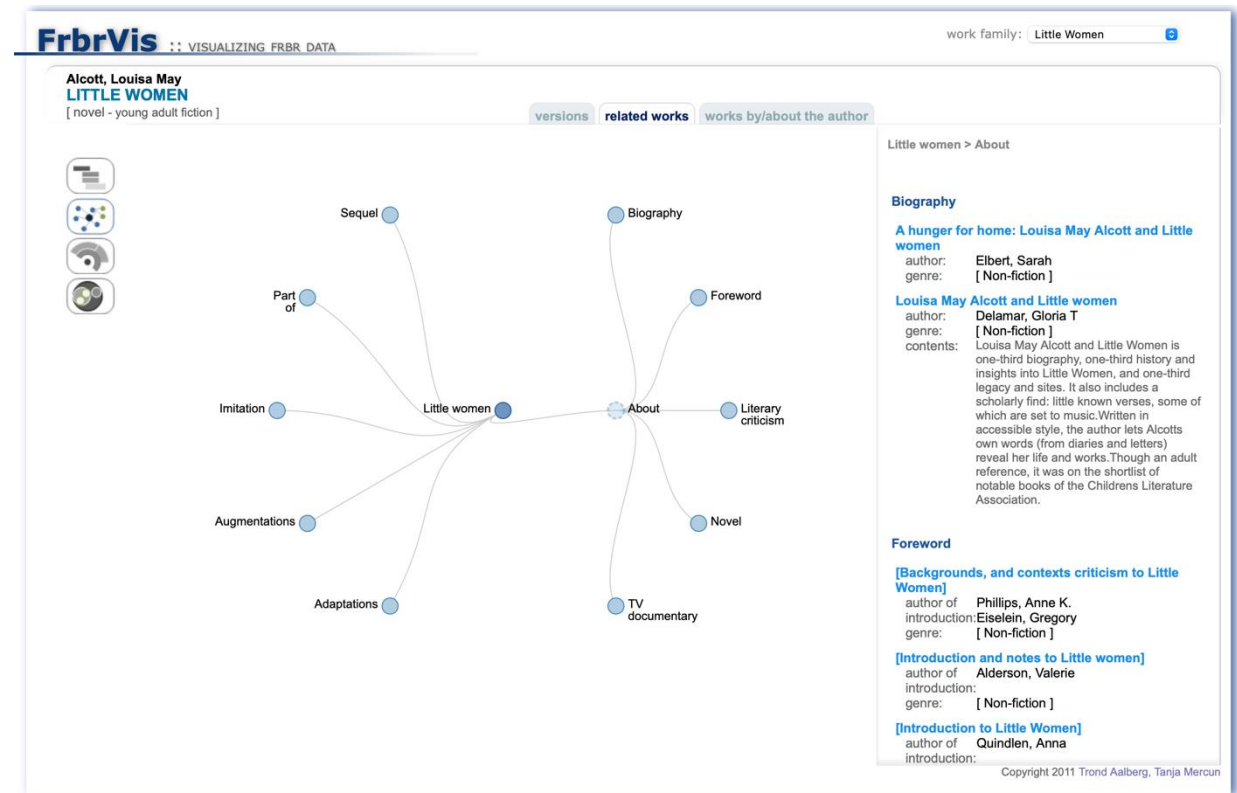
- A changing landscape of features and user expectations
- Full text indexing and ranking
  - Users expect relevant items on top
- Interactivity
  - The search is merely the first step
  - That can be refined by filtering, sorting, other interactions
- Exploring
  - Finding cues that can be explored (by navigation)
- Users learn and adapt
  - But not if the model and presentation conflicts with user expectations

# LRM and grouping of results

- Was early identified as a main feature of FRBR/LRM
  - To compact and reduce the size of result listings
  - More comprehensible presentation
- Is already a feature in many bibliographic systems
  - Groups that represent alternative versions
  - Mostly based on common key information such as author, titles
  - But rarely based on "true" LRM
- ...also found in other systems
  - LibraryThing, Amazon, ...

# Exploring WEMI search and display

- Earlier work on visualizations
- Graphs are difficult to present in user interfaces
- Visualizations of nodes and links
  - Uncommon interface for users
  - Difficult to combine graphs and text
- List-based remains the most convenient presentation



Merčun, Tanja; Žumer, Maja; Aalberg, Trond. (2017) Presenting bibliographic families using information visualization: Evaluation of FRBR-based prototype and hierarchical visualizations. *Journal of the Association for Information Science and Technology*



# Hierarchical displays

Aalberg, Trond; Mercun, Tanja; Zumer, Maja. (2017) Interactive displays for the next generation of entity-centric bibliographic models. Lecture Notes in Computer Science

## BIBSURF - Discover Bibliographic Entities

by Searching for Units of Interest, Ranking and Filtering

Query:

xmurder

add query term

Submit

Match:

Display:

Ranking:

Select collection:

Filter options:

☒ AND

☐ OR

☐ ANDOR

☐ Filter subtree

xClear all filters

Form of Work

☒ TV adaptation (3)

-

Actor

☐ Suchet, David (2)

☐ Bergman, Ingrid (1)

☐ Connery, Sean (1)

☐ Finney, Albert (1)

Director

+

Language

+

Type of Content

+

Type of Media

+

Type of Carrier

+


**Murder in Mesopotamia / Suchet, David (actor); Clegg, Tom (director) [TV adaptation]**

rdf

graph


Moving image (English)

Related works

 **Murder in Mesopotamia / producer, Brian Eastman ; director, Tom Clegg. [DVD - video]**

New York: A&E Home Video, c2001. Full screen ed. 1 videodisc (ca. 100 min.)

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 **Murder in Mesopotamia / producer, Brian Eastman ; director, Tom Clegg. [VHS - video]**

New York: A&E Home Video, c2001. 1 videocassette (ca. 100 min.)

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**Murder on the Orient Express / Bergman, Ingrid (actor); Finney, Albert (actor); Connery, Sean (actor); Lumet, Sidney (director) [TV adaptation]**

rdf

graph

Moving image (English)

Related works

 **Murder on the Orient Express / produced by John Brabourne and Richard Goodwin ; directed by Sidney Lumet. [VHS - video]**

Hollywood, CA: Paramount Home Video, c1990. 2 videocassettes (128 min.) in 1 container

show more >>

**Murder on the Orient Express / Suchet, David (actor); Martin, Philip (director) [TV adaptation]**

rdf

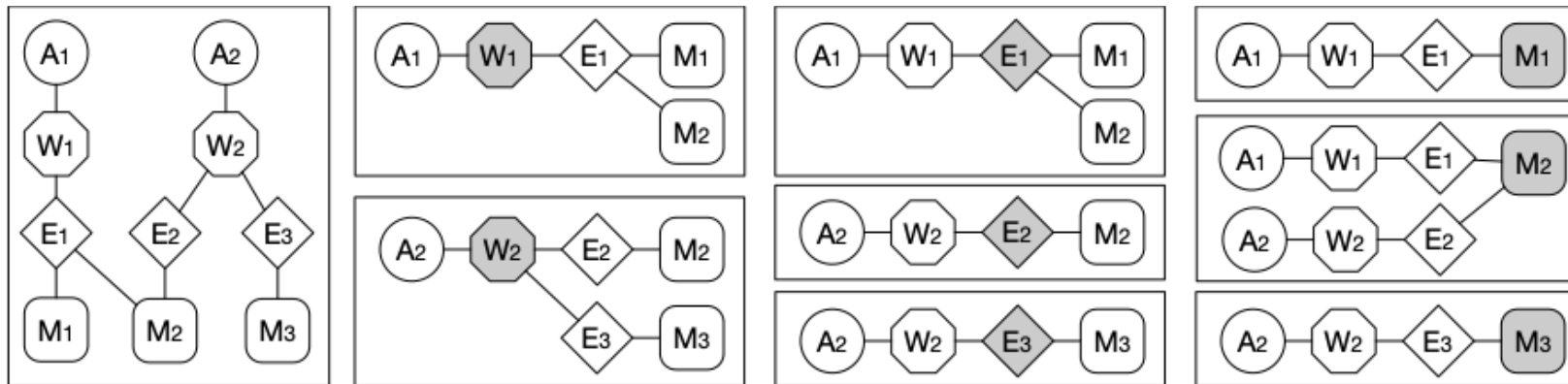
graph

Moving image (English)

Related works

# What entity type to display?

- Explicit representation of all WEMI entities requires support for multi-level listings
- Has proven useful, but different entities serve different user needs
- WEM(I) entity types as different focus points in the graph



# Expression centric displays



*Title:* **All the Pretty Horses**

*Author:* **McCarthy, Cormac**

Part of: [The border trilogy \(McCarthy, Cormac\)](#).

► 12 publications available



*Title:* **The border trilogy**

*Author:* **McCarthy, Cormac**

Includes: *All the **pretty horses** -- The crossing -- Cities of the plain*

► 4 publications available



*Title:* **The crossing**

*Author:* **McCarthy, Cormac**

Part of: [The border trilogy \(McCarthy, Cormac\)](#).

► 9 publications available



*Title:* **Cities of the plain**

*Author:* **McCarthy, Cormac**

Part of: [The border trilogy \(McCarthy, Cormac\)](#).

► 9 publications available

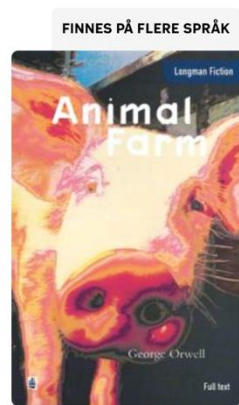


# Content vs. carrier

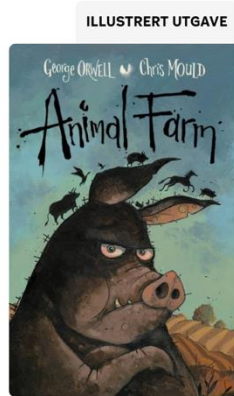
- Main feature of LRM is that it enables the description of content
  - As distinct expression entities
  - One manifestation embodies one or more expressions
  - Expressions and work can easily be merged in result presentations (1:1)
- But still many issues to address
  - Not all entities are equally interesting as individual entries
  - Many "singular" expressions in a collection
  - How and when to present same-entitytype relationships
  - The language of labels and target titles when presenting links

# Do LRM-based result listings match user needs?

- User needs are many and unpredictable
- The Norwegian public library [deichhman.no](http://deichhman.no) explores grouping based on "content uniqueness"



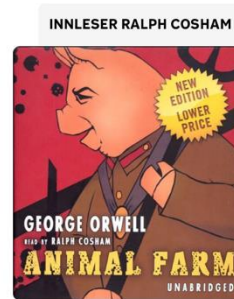
BOK  
**Animal farm**  
[George Orwell \(psevd. for Eric...](#)  
Engelsk (+9 flere)



BOK  
**Animal farm**  
[George Orwell \(psevd. for Eric...](#)  
Engelsk (+9 flere)



TEGNESERIE  
**Animal farm**  
[George Orwell \(psevd. for Eric...](#)  
Engelsk



LYDBOK  
**Animal farm**  
[George Orwell \(psevd. for Eric...](#)  
Engelsk (+9 flere)




BOK  
**Animal farm and  
Nineteen eighty-four**  
[Jenni Calder](#)  
Engelsk



TEGNESERIE  
**Fables. 2. Animal  
farm**  
[Bill Willingham](#)  
Engelsk

# But also cases of "good" match with LRM




## Edvard Grieg

Composer, Conductor, soloist


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Grieg: Peer Gynt Suites Nos...  
Maksymiuk, BBC Scottish Sy...  
2007 Naxos




Grieg: Violin Sonata No. 3 i...  
Lozakovich, Pletnev  
2024 Warner Classics




Grieg: Piano Concerto, Old ...  
Abravanel, Utah Symphony...  
2024 Vox




Grieg: Peer Gynt (Excerpts) ...  
Stolte, Neumann, Gewandh...  
1987 Decca Music Group Ltd.




Grieg: Peer Gynt Suites Nos...  
Abravanel, Utah Symphony...  
2024 Vox




Jens Harald Bratlie plays Gr...  
Bratlie  
2024 Lawo Classics




Grieg: Holberg Suite, Balla...  
Gugnin  
2024 Hyperion



Grieg: Symphonic Dances, L...  
Abravanel, Utah Symphony...  
2024 Vox

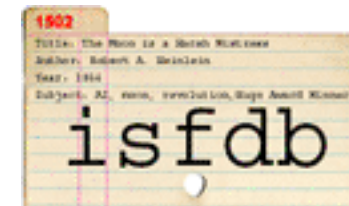


Grieg: Holberg Suite, Op. 4...  
Gugnin  
2024 Hyperion



Grieg: String Quartets Nos. ...  
Chilingirian Quartet, Sewar...  
1999 Hyperion

<https://www.idagio.com>



**Title:** Something Wicked This Way Comes

**Title Record #** 8151

**Author:** [Ray Bradbury](#)

**Date:** 1962-09-00

**Type:** NOVEL

**Series:** [Green Town](#)

**Webpages:** [Wikipedia-EN](#)

**Language:** English

**Synopsis:** A pair of 12 year old boys who witness the arrival of a carnival in their small midwestern US town realize the profound evil it represents, and must combat it without falling prey to it or being tempted to join it.

**User Rating:** 8.00 (25 votes) **Your vote:** Not cast [VOTE](#)

**Current Tags:** [fortune-telling Gypsy witch](#) (1), [horror](#) (1), [American Midwest](#) (1), [tempted to the dark side](#) (1), [dark character vs light character](#) (1), [aging in reverse](#) (1), [rapid aging](#) (1), [library](#) (1), [contemporary](#) (1), [midwest US](#) (1), [freak show](#) (1), [into-movie](#) (1), [childhood friends](#) (1), [fathers and sons](#) (1), [ancient evil](#) (1), [reanimation](#) (1), [carousel](#) (1), [Horror: Another 100 Best Books](#) (1), [dark carnival](#) (1), [living tattoo](#) (1), [child protagonist](#) (1), [magic](#) (1) [Add Tags](#)

## Other Titles

Translations			Translated Serializations		
Year	Language	Title	Year	Language	Title
1964 <sup>①</sup>	Swedish	<a href="#">Oktoberfolket</a>	1967	Italian	<a href="#">Il popolo dell'autunno (Complete Novel)</a>
1964 <sup>①</sup>	Finnish	<a href="#">Painajainen</a>			
1964 <sup>①</sup>	French	<a href="#">La foire des ténèbres</a> <sup>?</sup>			
1964 <sup>①</sup>	Japanese	<a href="#">何かが道をやってくる</a> <sup>?</sup> [as by <a href="#">レイ・ブラッドベリ</a> <sup>?</sup> ]			
1969 <sup>①</sup>	German	<a href="#">Das Böse kommt auf leisen Sohlen</a> <sup>?</sup>			
1976 <sup>①</sup>	Dutch	<a href="#">Aan het prikken van mijn duimen</a>			
1996	Italian	<a href="#">Il popolo dell'autunno</a>			
2019 <sup>①</sup>	Portuguese	<a href="#">Algo Sinistro Vem Por Ai</a>			

# The entity-based user experience

- Users should not need to be aware of the model
  - Final test is if the presentation matches user expectation
- Any model is a tool, and should be evaluated in the context of use
  - Data representation, data exchange and reuse, user applications
- Using LRM to implement search and exploration
  - A well defined model is a req for implementing well designed interfaces
    - Unambiguous, consistent, interpretable data
  - The value is in the data



# Still much to learn and explore

- Path from model to implementation is paved with best practices
- That are not yet developed nor evaluated...

