



Linked Data in Metadata Education

Findings and Future Directions

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Value of Linked Data in LAMs

LAMs have long recognized the significance of linked data, enriched resource descriptions

Linked data, Semantic Web begin appearing in LIS literature by 1999, begin growing around 2005

From hypothetical interest to real projects?

- Learning concepts (semantics, ontologies)
- Learning skills (RDF/XML, SPARQL)

Developing the Skills

Metadata practitioners active in the field often develop these skills through work or continuing education

Schilling (2012)

- Practitioner understanding of vocabularies, ontologies good
- Practitioner grasp of technical abilities not so good...

Smith-Yoshimura (2018)

- Growing number of existing staff are taking on linked data responsibilities

Developing the Skills

Park & Tosaka (2017)

- Major barriers around linked data continuing education
- Difficulty in selecting learning resources
- Uncertainty about which skills to develop

Mikroyannidis et al. (2014)

- EUCLID, a free modular curriculum on linked data for metadata professionals

Much continuing education in this area involves navigating open educational resources

Linked Data Training and Resources

A number of prominent information organizations provide some online educational resources

- OCLC's Getting Started with Linked Data
- Library of Congress's Linked Data Service
- Europeana's supporting materials

Many other resources scattered around online, from various sources

EUCLID

Educational Curriculum for the Usage of Linked Data

2012-2014 project funded by Seventh Framework Programme

Focus on needs of practitioners

- Data architects, managers, analysts

Six modules based around functional skills

- Querying, integrating, visualizing, building applications

Companion book, *Using Linked Data Effectively*

<http://euclid-project.eu/index.html>

Competency Index for Linked Data

LD4PE (Linked Data for Professional Educators)

2011-present project funded by IMLS, others

Focused on the educational needs of information professionals

Originally an articulation of key learning topics

Now a formal index of topics, competencies, and benchmarks, with related resources

<https://dcmi.github.io/ldci/D2695955/>

Competency Index for Linked Data

A: RDF vocab

- B: Finding RDF vocabularies
 - C: Knows how to find and explore vocabularies
 - D: Finds and explores vocabularies
- B: Designing RDF vocabularies
 - C: Uses RDF vocabularies
 - D: Correctly uses vocabularies
 - D: Correctly uses vocabularies

Competency: Finding RDF-Based Vocabularies

Providing Linked Data

This video presentation covers the whole spectrum of Linked Data production and exposure. It begins with a grounding in Linked Data principles and best practices, [...]

★☆☆☆☆ (1 user rating)

Linked Open Vocabularies (LOV): A Gateway To Reusable Semantic Vocabularies On The Web

One of the major barriers to the deployment

Freebase: An Open, Writable Database Of The World's Information

Freebase was an open database of the world's information, built by a global community and made free for anyone to query, contribute to, and use as [...]

★☆☆☆☆ (1 user rating)

Library Linked Data Incubator Group: Datasets, Value Vocabularies, And Metadata Element Sets

This report on datasets, value vocabularies

Preparing Future Professionals

Active practitioners have challenges and opportunities

What about students/future professionals?

Joudrey & McGinnis (2014)

- Metadata work will take place in an increasingly linked environment
- Semantic Web, RDF are critical concepts

Teaching Linked Data

Academic Curricula

Growing interest around linked data education by mid-2000s

First appearance in *JELIS* in 2007

LIS, other programs begin to deal with linked data

- Shift from conceptual curiosity to practical skill
- What do students need to know? To do?

Linked data education exists in curricula beyond LIS programs

ALCTS Core Competencies (2017)

Core Competencies for Cataloging and Metadata Professional Librarians

<http://hdl.handle.net/11213/7853>

Knowledge Competencies

- Understands conceptual models for library data (Ex. FRBR, RDF)
- Understands... unique identifiers for indexing and referential functionality
- Understands methods and approaches for metadata creation, editing, analysis, and transformation

Skill & Ability Competencies

- Disambiguates creators, contributors, titles/series
- Encodes machine-actionable data

Formal Coursework

Library & Information Science Programs

Linked data topics are featuring more in information organization courses (Pattuelli, 2010), metadata courses

Some dedicated linked data courses

- Ontology Design (Washington)
- Linked Open Data for Libraries, Archives, and Museums (Pratt)

More often take the form of “special topics” courses

- Seminar in Information Science: Linked Data (SJSU)

Overall emphasis on ontologies, data models and structures, vocabularies

Formal Coursework

Computer Science/Engineering Programs

Saw some of the earliest courses dedicated to linked data

- MIT's Linked Data Ventures class (Fall 2010)

Have become fairly routine offerings at grad and undergrad level

- Semantic Web (Stony Brook)
- Web of Data (UMBC)
- Data and Web Semantics (Illinois)

Overall focus on technical specifications, publishing, app development

Reworking Curricula

Shortcomings

Developing technical skills...

Maceli (2015)

- Review of technology-related LIS courses
- Comparison to LIS jobs posted on Code4lib
- Findings
 - Linked data topics slowly gaining momentum
 - Linked data still among more infrequent course topics
 - Semantic web topics also in web design

Reworking Curricula

Solutions

Miller et al. (2012)

- Curriculum development at UW-Milwaukee
- Linked Data for Libraries: Mashups, Semantic Web & Web 2.0
- RDF, Ontologies, and the Semantic Web
- But... should we await actual implementations in libraries?

Reworking Curricula

Solutions

Zeng & Qin (2016)

- Enmeshing linked data concepts and practices into core metadata education
- Introducing ontologies early
- RDF/XML

Leveraging the Competency Index!

Future Directions?

How should linked data be taught?

- Linked data need not be a separate topic
- Metadata as a key course for supporting linked data
- Ontologies/taxonomies, concepts as own course?

Finding synergy between metadata, information architecture, and web design courses

Drawing approaches from Computer Science, other disciplines

Future Challenges?

Finding room!

- Information organization topics are already crowded (Joudrey & McGinnis, 2014)
- Growing need to understand social, ethical implications of representation (Snow, 2019)

Developing technical skills

- Infrastructure to support
- Practicing skills
- Which skills...?

Conclusions

Linked data concepts increasingly present in LIS courses

More technical skills present in other programs, special topics courses, continuing education resources

Adjusting curriculum to leverage resources, respond to changes in practice

Providing both conceptual and technical skills!