A Linked Data Competency Framework for Educators and Learners

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On behalf of
LD4PE (Linked Data for Professional Education) Project Team

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Outline

- Part I. Background
  - Linked Data for Professional Education (LD4PE) project
  - LD4PE Major Products
- **Part II. The *Competency Index for Linked Data***
- Part III. Learning Resources Connected with the Competencies
- Part IV. Using the *Competency Index for Linked Data* in Self-Learning, Teaching, and Training

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Part I. Background

Exploring
Linked Data
LD4PE

Linked Data for Professional Education (LD4PE) project

http://explore.dublincore.net/

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Linked Data for Professional Education (LD4PE) Project

INSTITUTE of
Museum and **Library**
SERVICES

- Funded by the Institute of Museum and Library Services (IMLS)
  - December 1, 2014 - November 30, 2017

- A project under the jurisdiction of the DCMI Education & Outreach Committee

- Led by:
  - University of Washington, Information School. **Michael Crandall**, P.I.
  - Kent State University, School of Information.
  - Dublin Core Metadata Initiative (DCMI).

- Content Partners:
  - Sungkyunkwan University (Korea)
  - Access Innovations
  - Synaptica
  - Elsevier
  - OCLC

- **Technical development:**
  - Joseph Chapman
  - David Talley

LD4PE PARTNERS · SUNG KYUN KWAN UNIVERSITY · KENT STATE · OCLC · ELSEVIER · Access Innovations Inc. · synaptica · Information School UNIVERSITY of WASHINGTON · Dublin Core Metadata Initiative

Slide 5

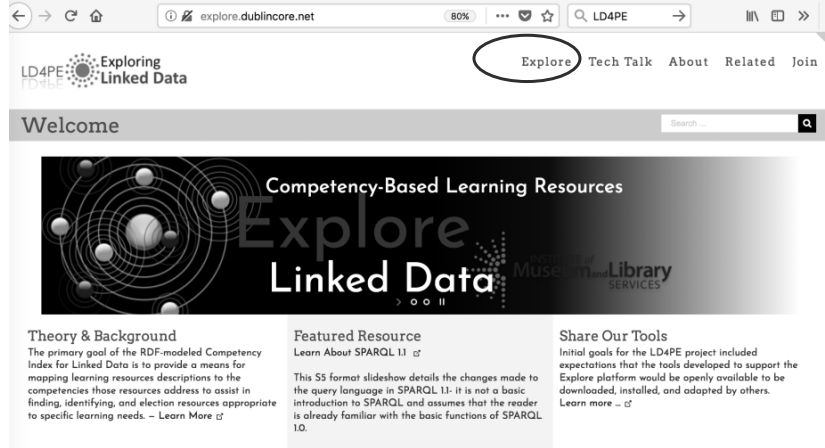# LD4PE Major Products

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Competency Index for Linked Data
-- defines a set of assertions of the knowledge, skills, and habits of mind required for professional practice in the area of Linked Data.

Learning Resource Descriptions
-- A set of learning resources
- open sources
- described in metadata
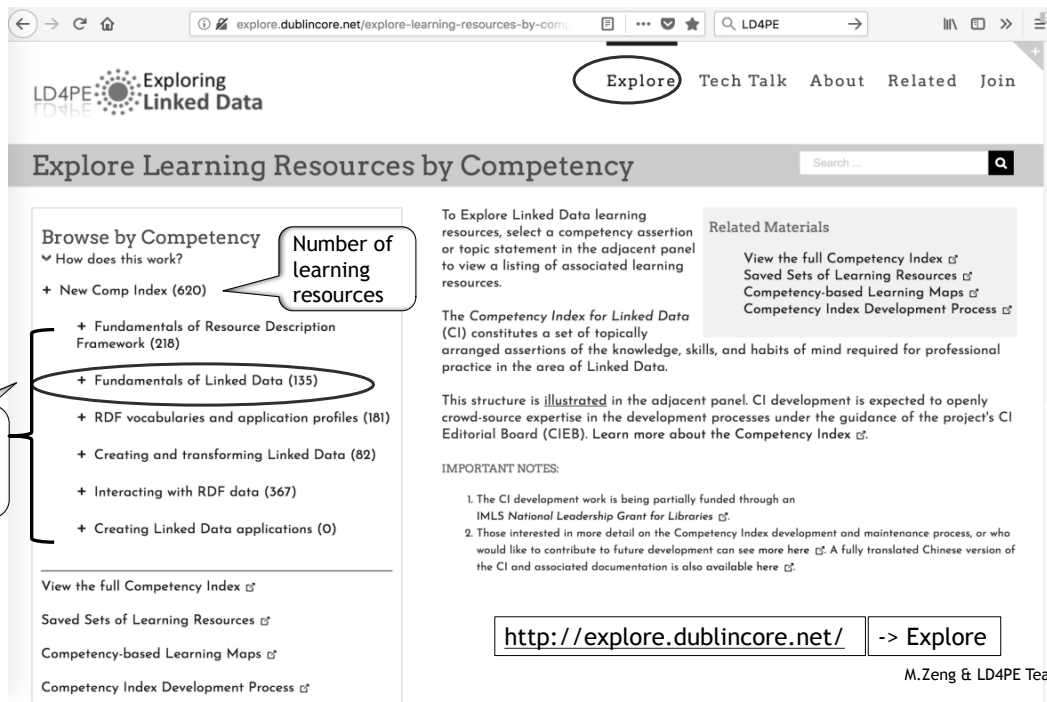- mapped to competencies

http://explore.dublincore.net/

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Explore online

Number of learning resources

Topic Clusters

http://explore.dublincore.net/   -> Explore

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(cont.) Explore online

http://explore.dublincore.net/explore-learning-resources-by-competency/

Part II. Introducing
the *Competency Index for Linked Data*

"...dex for RDF & Linked Data"
...ex.org/resources/D2529179

"RDF & Linked Data fundamentals"
http://ex.org/resources/S2529200

"Existing key vocabularies and their namespaces"
http://ex.org/resources/S2529255

"Investigates, evaluates and keeps abreast of significant developments in RDF vocabularies"
http://ex.org/resources/S2529199

"Searches to discover new and u...
vocabularies and application p...
http://ex.org/resources/S...

"Monitors changes t...
vocabularies an...
http://...

...mpetency
...tatements

Taxon Path

The *Linked Data Competency Index* provides:
➢ a concise and readable map of concepts and skills
  ➢ related to practices and technologies of Linked Data
  ➢ for the benefit of interested learners and teachers.

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"Competency Index"
  - A **thematic set of competencies** organized by:

•Topic
  ## • Competency   *understanding*
    ❖ *a tweet-length phrase about knowledge or skills that can be learned*
    ## • Benchmark
    ❖ *an action that demonstrates accomplishment in a*   *doing*
    given competency

Topical Cluster » Topic » Competency » Benchmark

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The development of the
Competency Index for Linked Data

13

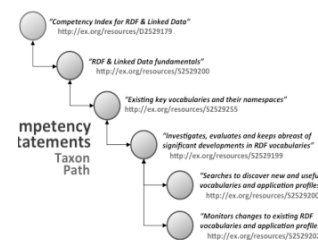Editorial Board met monthly over a period of approximately 18 months.

Tom Baker, chair

- Expert input
- User testing

Tries to cover:
- **Enough topics** to convey a map of the domain
- **Enough detail** on domain competency

Does NOT cover:
- NOT: Levels of difficulty
  - "Basic" for a library scientist may be "difficult" for a computer scientist (and vice versa)
- NOT: Ranking or ordering topics
  - for the same reasons

LD4PE Exploring Linked Data

6 clusters

30 topics

95 competencies

Browse by Competency
˅ How does this work?

+ New Comp Index (564)

    + Fundamentals of Resource Description Framework (208)

    + Fundamentals of Linked Data (112)

    + RDF vocabularies and application profiles (163)

    + Creating and transforming Linked Data (65)

    + Interacting with RDF data (346)

    + Creating Linked Data applications (0)

View the full Competency Index ↗

Saved Sets of Learning Resources ↗

Competency-based Learning Maps ↗

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Competency Index for Linked Data

6 clusters

14

30 topics

95 competencies

1. Fundamentals of Resource Description Framework
- Identity in RDF
- RDF data model
- Related data models
- RDF serialization

Fundamentals of Resource Description Framework (218)

+ Identity in RDF (38)

+ RDF data model (148)

+ Related data models (52)

- RDF serialization (66)

  ↘ - Understands RDF serializations as interchangeable encodings of a given set of triples (RDF graph). (30)

    ↘ Uses tools to convert RDF data between different serializations. (7)

  ↘ - Distinguishes the RDF abstract data model and concrete serializations of RDF data. (41)

    ↘ Expresses data in serializations such as RDF/XML, N-Triples, Turtle, N3, Trig, JSON-LD, and RDFa. (33)

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Competency Index for Linked Data

6 clusters 15
30 topics
95 competencies

1. **Fundamentals of Resource Description Framework**
2. **Fundamentals of Linked Data**
   - Web technology
   - Linked data principles
   - Linked Data policies and best practices
   - Non-RDF Linked Data

Fundamentals of Linked Data (135)

+ Web technology (93)

- Linked Data principles (66)

↘ Knows Tim Berners-Lee's principles of Linked Data: use URIs to name things, use HTTP URIs that can be resolved to useful information, and create links to URIs of other things. (0)

↘ Knows the "five stars" of Open Data: put data on the Web, preferably in a structured and preferably non-proprietary format, using URIs to name things, and link to other data. (66)

+ Linked Data policies and best practices (16)

Non-RDF linked data (0)

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Competency Index for Linked Data

1. **Fundamentals of Resource Description Framework**
2. **Fundamentals of Linked Data**

3. **RDF vocabularies and application profiles**
   - Finding RDF-based vocabularies
   - Maintaining RDF vocabularies
   - Versioning RDF vocabularies
   - Publishing RDF vocabularies
   - Mapping RDF vocabularies
   - RDF application profiles
   - Designing RDF-based vocabularies

- Designing RDF-based vocabularies (142)
  + Uses RDF Schema to express semantic relationships within vocabulary. (53)

  Knows the naming conventions for RDF properties and classes. (9)

  Reuses published properties and classes where available. (32)

  + Coins namespace URIs, as needed, for any new properties and

Designing RDF-based vocabularies (142)

↘ Uses RDF Schema to express semantic relationships within a vocabulary. (53)

↘ Correctly uses sub-class relationships in support of inference. (22)

↘ Correctly uses sub-property relationships in support of inference. (25)

Knows the naming conventions for RDF properties and classes. (9)

Reuses published properties and classes where available. (32)

↘ Coins namespace URIs, as needed, for any new properties and classes required. (14)

↘ Drafts a policy for coining URIs for properties and classes. (1)

↘ Chooses "hash"- or "slash"-based URI patterns based on requirements. (9)

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Competency Index for Linked Data

17

6 clusters

30 topics

95 competencies

1. **Fundamentals of Resource Description Framework**
2. **Fundamentals of Linked Data**
3. **RDF vocabularies and application profiles**
4. **Creating and transforming RDF Data**
   - Managing identifiers (URIs)
   - Creating RDF data
   - Versioning RDF data
   - RDF data provenance
   - Cleaning and reconciling RDF data
   - Mapping and enriching RDF data

- Creating and transforming Linked Data (82)
  + Managing identifiers (URI) (19)
  - Creating RDF data (44)
    ↘ Generates RDF data from non-RDF sources. (13)
    ↘ Knows methods for generating RDF data from tabular data in formats such as Comma-Separated Values (CSV). (14)
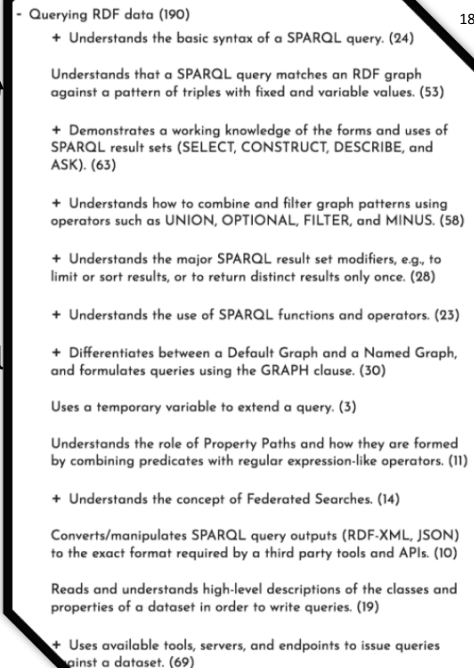   ↘ Knows methods such as Direct Mapping of Relational Data to RDF (2012) for transforming data from the relational model (keys, values, rows, columns, tables) into RDF graphs. (23)

  Versioning RDF data (0)

  RDF data provenance (0)

  + Cleaning and reconciling RDF data (17)

  Mapping and enriching RDF data (32)

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Competency Index for Linked Data

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1. **Fundamentals of Resource Description Framework**
2. **Fundamentals of Linked Data**
3. **RDF vocabularies and application profiles**
4. **Creating and transforming RDF Data**

5. **Interacting with RDF Data**
   - Processing RDF data using programming l...
   - Querying RDF Data
   - Visualizing RDF Data
   - Reasoning over RDF data
   - Assessing RDF data quality
   - RDF Data analytics
   - Finding RDF Data
   - Manipulating RDF Data

- Querying RDF data (190)
  + Understands the basic syntax of a SPARQL query. (24)

  Understands that a SPARQL query matches an RDF graph against a pattern of triples with fixed and variable values. (53)

  + Demonstrates a working knowledge of the forms and uses of SPARQL result sets (SELECT, CONSTRUCT, DESCRIBE, and ASK). (63)

  + Understands how to combine and filter graph patterns using operators such as UNION, OPTIONAL, FILTER, and MINUS. (58)

  + Understands the major SPARQL result set modifiers, e.g., to limit or sort results, or to return distinct results only once. (28)

  + Understands the use of SPARQL functions and operators. (23)

  + Differentiates between a Default Graph and a Named Graph, and formulates queries using the GRAPH clause. (30)

  Uses a temporary variable to extend a query. (3)

  Understands the role of Property Paths and how they are formed by combining predicates with regular expression-like operators. (11)

  + Understands the concept of Federated Searches. (14)

  Converts/manipulates SPARQL query outputs (RDF-XML, JSON) to the exact format required by a third party tools and APIs. (10)

  Reads and understands high-level descriptions of the classes and properties of a dataset in order to write queries. (19)

  + Uses available tools, servers, and endpoints to issue queries against a dataset. (69)

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Competency Index for Linked Data

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1. **Fundamentals of Resource Description Framework**
2. **Fundamentals of Linked Data**
3. **RDF vocabularies and application profiles**
4. **Creating and transforming RDF Data**
5. **Interacting with RDF Data**
6. **Creating Linked Data applications**
   - Storing RDF data

6 clusters

30 topics

95 competencies

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Slide 20

Competency Index for Linked Data 20

Overview

- Fundamentals of Resource Description Framework (208)
  1. + Identity in RDF (35)
  + RDF data model (142)
  + Related data models (52)
  + RDF serialization (60)

- Fundamentals of Linked Data (112
  2. + Web technology (76)
  + Linked Data principles (53)
  + Linked Data policies and best pra
  Non-RDF linked data (0)

- RDF vocabularies and application profiles (163)
  3. + Finding RDF-based vocabularies (14)
  + Maintaining RDF vocabularies (0)
  + Versioning RDF vocabularies (1)
  + Publishing RDF vocabularies (32)
  + Mapping RDF vocabularies (18)
  + RDF application profiles (17)
  + Designing RDF-based vocabularies (1

- Creating and transforming Link
  4. + Managing identifiers (U
  + Creating RDF data (36)
  Versioning RDF data (0)
  RDF data provenance (0)
  + Cleaning and reconciling RDF data (12)
  + Mapping and enriching RDF data (25)
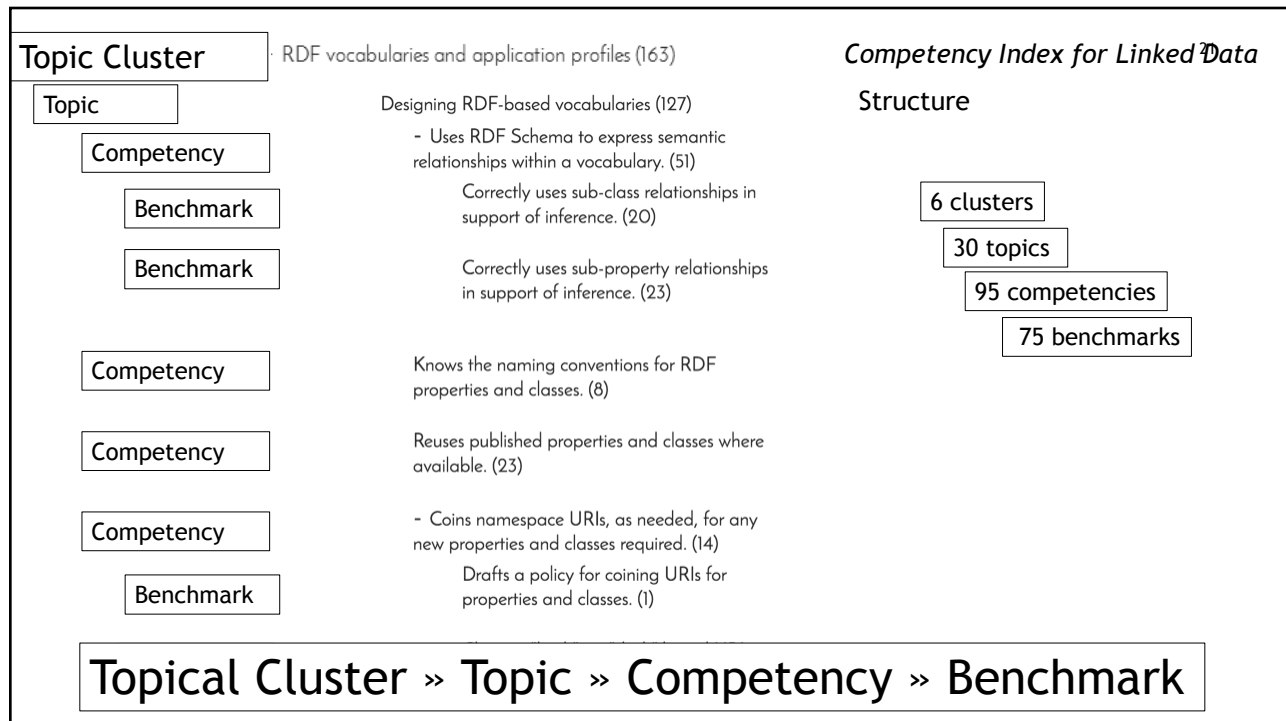
- Interacting with RDF data (346)
  5. + Processing RDF data using programming languages. (80)
  + Querying RDF data (181)
  + Visualizing RDF data (25)
  + Reasoning over RDF data (81)
  Assessing RDF data quality (0)
  + RDF data analytics (15)
  + Finding RDF data (36)
  + Manipulating RDF data (64)

6. - Creating Linked Data applications (0)
  Storing RDF data (0)

6 clusters

30 topics

Competency Index full version available from http://explore.dublincore.net
→ Explore

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Topic Cluster

RDF vocabularies and application profiles (163)

Topic

Designing RDF-based vocabularies (127)

Competency

– Uses RDF Schema to express semantic relationships within a vocabulary. (51)

Benchmark

Correctly uses sub-class relationships in support of inference. (20)

Benchmark

Correctly uses sub-property relationships in support of inference. (23)

Competency

Knows the naming conventions for RDF properties and classes. (8)

Competency

Reuses published properties and classes where available. (23)

Competency

– Coins namespace URIs, as needed, for any new properties and classes required. (14)

Benchmark

Drafts a policy for coining URIs for properties and classes. (1)

Competency Index for Linked Data

Structure

6 clusters

30 topics

95 competencies

75 benchmarks

Topical Cluster » Topic » Competency » Benchmark

Part III. Learning Resources Connected with the Competencies

- Demo: Finding related learning resources
- Explanation: How a learning resource is described and mapped to CI

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Where should I start?

http://explore.dublincore.net/

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Browse Competency Index

Search for Resources
By Competency
By Keyword

1

- Start at the top of the hierarchy and drill down.
- Select a topic cluster and expand the menu to look through the sub-options.

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Clicking on the competency's text --

-- related resources are displayed on the right side of the page.

3

2

Descriptions help individuals make decisions about which resources to investigate further.

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Try it! Go to: <u>http://explore.dublincore.net/</u> Choose "Explore"

• Start at the top of the hierarchy and drill down.
• Select a topic cluster and expand the menu to look through the sub-options.

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Part IV. Using the
Competency Index for Linked Data
in
self-learning, teaching, and training

1. **Learning maps** -- competencies
2. **Saved sets** – resources
3. **The OCLC Dataset**

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1. Learning Maps -- competencies

- Lay out a path to follow

- List competencies targeted to specific audience or theme

- Link each competency to a list of resources which teach the competency
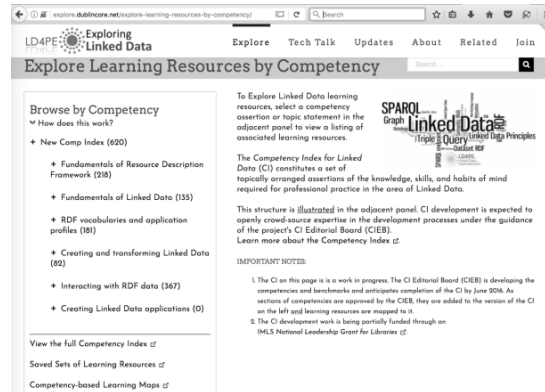
View the full Competency Index

Saved Sets of Learning Resources

Competency-based Learning Maps

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Examples of Learning Maps

Competencies for Catalogers
Created: 8/29/2017

Considers the paradigm shift necessary to catalog to an exp

Set Creator: Sean Dolan

Competencies for Data Scientists
Created: 8/11/2017

Recognizing Linked Data as a valuable resource and dealing

Set Creator: Sean Dolan

Competencies for Web Developers
Created: 7/24/2017

Topics include RDF serializations, microdata for HTML marku

Set Creator: Sean Dolan

Competencies for Librarians
Created: 7/22/2017

Deals with the challenges of transitioning from traditional bib

Set Creator: Sean Dolan

Competencies for Archivists
Created: 7/15/2017

For quickly getting archivists up-to-speed with Linked Data sc

Set Creator: Sean Dolan

See a list of the learning maps at http://explore.dublincore.net/explore-learning-resources-by-competency/learning-maps/

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Slide 1

Learning Map

E.g., for Catalogers, what are the key competencies?

Learning Map: Competencies for Catalogers
⌄ What's This?

Considers the paradigm shift necessary to catalog to an expanded audience (the Web) as well as technical details involved.

Understands that Linked Data (2006) extended the notion of a web of documents (the Web) to a notion of a web of finer-grained data (the Linked Data cloud).
69 resources

Knows Tim B
use HTTP UR
URIs of other
0 resources

Knows that U
Resource Loc
independent
18 resources

Understands
distinct from
0 resources

Knows the su
46 resources

Understands

Understands the use of datatypes and language tags with literals.
15 resources

Knows graphic conventions for depicting RDF-based models.
10 resources

Distinguishes the RDF abstract data model and concrete serializations of RDF data.
41 resources

Recognizes that owl:sar
formal semantics that d
13 resources

Identifies resource attr
candidates for RDF pro
9 resources

Uses RDF Schema to ex
53 resources

Coins namespace URIs,
required.
14 resources

Knows Simple Knowle
vocabulary for expressi
organized into informa
24 resources

Knows SKOS eXtension for Labels, or SKOS-XL (2009), a small set of additional properties for describing and linking lexical labels as instances of the class Label.
4 resources

Managing identifiers (URI)
19 resources

Creating RDF data
44 resources

Cleaning and reconciling RDF data
17 resources

Mapping and enriching RDF data
32 resources

Knows the SPARQL 1.1 Update language for updating, creating, and removing RDF graphs in a Graph Store
32 resources

Understands the difference between SQL query language (which operates on database tables) and SPARQL (which operates on RDF graphs).
43 resources

- Below each competency, the number of tagged resources are listed.

- Clicking this link will take you to these resources.

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Slide 2

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2. Saved Sets — resources

- Curated collection of learning resources

- Targeted to a specific audience or theme

- Each item links to a resource's description page

http://explore.dublincore.net/explore-learning-resources-by-competency/all-saved-sets

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Slide 33:

Resources for Catalogers
Created: 8/31/2017

Set Creator: Sean Dolan

Resources for Data Scientists
Created: 8/11/2017

Recognizing Linked Data as a valuable resource and dealing with unfamiliar d...

Set Creator: Sean Dolan

Resources for Web Developers
Created: 7/24/2017

Emphasizing how Linked Data effects page markup and search engine optimiz...

Set Creator: Sean Dolan

Resources for Librarians
Created: 7/22/2017

These resources focus on transitioning from traditional bibliographic records to...

Set Creator: Sean Dolan

Resources for Archivists
Created: 7/15/2017

Some of these resources present Linked Data in the context of library and archi...
that are invaluable to this audience.

Set Creator: Sean Dolan

SKOS
Created: 3/11/2017

Learning SKOS for transferring thesauri into LOD

Set Creator: sophy

PCC Standing Committee on Training Recommended
Created: 10/25/2016

Set Creator: mw2064

Learning Resources in Saved Set: Resources for Catalogers (13 resources)

The Academy Unbound Linked Data as Revolution
Much has been said about Linked Data, its ties to the Semantic Web, and its application for libraries, but what is it exactly and how[...]

Linked Data Patterns
This resource is a pattern catalogue for modelling, publishing, and consuming Linked Data which adopts a tried and tested means of communicating knowledge and experience[...]

Metadata Crosswalks
This slide presentation focuses on search interoperability, which the author defines as the "ability to perform a search over diverse sets of metadata records to[...]

BIBFRAME Training at the Library of Congress: Introduction to the Semantic Web and Linked Data
This resource was developed by the Library of Congress as one part of a pilot training project which tested the use of BIBFRAME for bibliographic[...]

Linked Data at the National Library of Sweden
This talk explains how LIBRIS, the National Library of Sweden's union catalog, has been linked via an interface to RDF datasets. The first speaker discusses[...]

An Introduction to RDF Schema
This slide presentation discusses RDF Schema, including classes, sub-classes, and instances. Concepts such as domain and range, datatypes and literals, labels and comments are also[...]

Free Your Metadata: Clean up your metadata
A brief tutorial containing both a screencast and text instructions for cleaning an example dataset (from the Powerhouse Museum) using Open Refine (formerly Google Refine).[...]

Joining the Linked Data Cloud in a Cost-Effective Manner
Linked Data holds the promise to derive additional value from existing data throughout different sectors, but practitioners currently lack a straightforward methodology and the tools[...]

The Vocabulary Mapping Framework (VMF): An Introduction v1.0
This document provides an introduction to the structure and development of the Vocabulary Mapping Framework (VMF) up to the end of the first stage of[...]

Publishing Relational Databases as Linked Data
These slides appear to have been used for a course in Database Management Systems at the University of Toronto, but contain material which the creator[...]

http://explore.dublincore.net/explore-learning-resources-by-competency/all-saved-sets

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Slide 34:

3. The OCLC Dataset

WorldCat Linked Data (Library Science Subset)

Extracted from the original MARC records based on:
- FAST headings
- DDC classes
- LCC subclasses

Why provide a dataset?

- You have static data to test skills on or to use in creating new learning resources

- Ensures that consistent results can be obtained from queries and that access will not suddenly disappear

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OCLC Dataset

The Online Computer Library Center (OCLC) has published a dataset, WorldCat Linked Data (Library Science Subset), so that those who visit the LD4PE site will have static data to test their skills on or to use in creating their own learning resources. Using the WorldCat dataset for these pursuits ensures that consistent results can be obtained from queries and that access to the dataset will not suddenly disappear.

Access the static dataset at: http://purl.org/dataset/WorldCat/LibraryScienceSubset

A tutorial and some example queries are available for those interested in getting started in using this resource.

This dataset identifies and describes bibliographic resources gleaned from library, archives, and museum data from around the world. This subset is focused on bibliographic resources broadly related to the theme of library science. Specifically, resource descriptions were extracted from the original MARC records if they met at least one of the following criteria:

- FAST headings "library", "libraries", "librarian", or "librarianship" in field 650
- DDC classes "Library & information sciences" (020 through 028) in field 082
- LCC subclasses for "Libraries" (Z662 through Z1000.6)
- "Information resources (General)" (ZA 3038 through ZA 5190) in field 050.

Records with "N@F" in the 040 field (name of the organization that created the original record) were excluded. Download more detailed information (PDF, 439KB).

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Slide 35

DOWNLOAD as:
N-TRIPLES
MARC/XML

LICENSE:
ODC-BY

AVAILABILITY:
through December 2027

WorldCat Linked Data (Library Science Subset)

VoID Dataset Description

<http://purl.org/dataset/WorldCat/LibraryScienceSubset>

cc:attributionName		"WorldCat Linked Data (Library Science Subset)"
cc:attributionURL		<http://purl.org/dataset/WorldCat/LibraryScienceSubset>
cc:morePermissions		<mailto:data@oclc.org>
cc:useGuidelines	rdf:value	**Attribution** The preferred form of attribution is: "Contains OCLC WorldCat Linked Data (Library Science Subset) information made available under the ODC Attribution license. The OCLC cooperative requests that uses of WorldCat derived data contained in this work conform with the WorldCat Community Norms." Special cases: In circumstances where providing the full attribution statement above is not technically feasible, the use of canonical WorldCat Work URIs is adequate to satisfy Section 4.3 of the ODC Attribution license.
schema:description		"WorldCat Linked Data (Library Science Subset) is a dataset that identifies and describes bibliographic resources that are gleaned from library, archives, and museum data from around the world. This subset is focused on bibliographic resources broadly related to the theme of library science. WorldCat is a registered trademark of OCLC Online Computer Library Center, Inc."
dcterms:license		<http://opendatacommons.org/licenses/by/1.0/>
schema:publisher		<http://viaf.org/viaf/156508705>
	foaf:homepage	<http://www.oclc.org/>
	foaf:page	<http://worldcat.org/identities/lccn-n78-15294>
	schema:sameAs	<http://dbpedia.org/resource/Online_Computer_Library_Center>

ACCESS THE DATASET AT:
http://purl.org/dataset/WorldCat/LibraryScienceSubset

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Slide 36

A <u>tutorial and some example queries</u> are available for those interested in getting started in using this resource.

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TUTORIAL :

- DOWNLOAD DATASET
  - N-Triples

- STORE PERSISTENTLY
  - Apache Jena's TDB (Triple Store)

- Query using SPARQL
  - Command Line using TDBQUERY (similar to ARQ)
  - Interpreting and storing results

PDFs AVAILABLE:

Introduction
This tutorial was created both to highlight the potential [...] Competency Index. Early sections address topics related to [...] SPARQL queries introduce the broad topic of "Querying RDF [...] sets. Finally, a series of exercises prompt the user to write ta[...] advanced uses of SPARQL functions and operators that mak[...]

There are a great number of SPARQL tutorials on the Web, b[...] which do not always hold true in real-life cases:

   1. That the dataset the user wants to query is relatively sm[...]
   2. That if the user is querying a massive database (e.g., DB[...]

What does the user do when he or she discovers that their da[...] contains over twenty million triples? The WorldCat Dataset is [...]

There are many different tools available for storing and query[...] ultimately be used. This tutorial represents only one possible [...] Dataset and start exploring it as quickly as possible and, hop[...]

Accessing the Dataset
Let's say that a colleague has given you a link to a dataset: h[...]

Download detailed introductory information ☐ (PDF, 274KB)

Storing the Data
Before you can start querying the data, we need to load it int[...] Apache Jena's TDB.

Download instructions for storing the dataset ☐ (PDF, 115KB)

Querying the Data
When faced with a new and unfamiliar dataset, it is helpful to [...] describe the data. Without this knowledge, writing queries [...] d can quickly give you an idea what a dataset is all about.

[...]d exercises for exploratory queries ☐ (PDF, 174KB)

Simple Queries
The following sections contain walkthroughs [...] some s[...] r users new to the SPARQL query lang[...]ge.

Simple Query 1: Union and Shared Subjects
Start with this query: *What languages are represented in [...]*

To write this query, you need to determine one vital piece [...] Fortunately, you already know all the classes and properti[...] you skim through the result set you saved, you see that the [...] *'http://schema.org/inLanguage'.*

To determine which property you should use in future quer[...] give you an idea how the dataset's creators used these pro[...]

Download exercises for Simple Query 1 ☐ (PDF, 149KB)

Simple Query 2: Optional and Turning an Object into a [...] Now that we know which properties are used to describe l[...] Let's limit the type of Creative Works we are looking for t[...] string together a few triple statements.

Download exercises for Simple Query 2 ☐ (PDF, 203KB)

Simple Query 3: Negation Using Not Exists and Minus [...] What if, on the hand, we had wanted to write a query spe[...] in other languages (i.e., works originally written in French)[...] topic of NEGATION.

Download exercises for Simple Query 3 ☐ (PDF, 118KB)

Additional SPARQL Exercises
You are now ready to try writing some queries on your own[...] which accomplish each task (answers).

[...]ownload SPARQL exercises ☐ (PDF, 128KB)

[...]ad exercise answer walkthrough ☐ (PDF, 169KB)

```
pd_french.rq - Notepad
File Edit Format View Help
PREFIX schema:<http://schema.org/>
SELECT DISTINCT ?s ?name
WHERE {
    ?s a  schema:Book;
       schema:inLanguage "fr";
       schema:name ?name.
}
```
Figure 12: SPARQL query to retrieve all books written in French

---

Summary (1)

Competency Index for Linked Data

What is a competency index used for?

- Describes what a learner can learn.

- Describes skills that demonstrate understanding.

- Basis for:
  - job descriptions
  - course syllabi
  - university degrees
  - micro-credentials
  - digital badges

- Tags descriptions of learning resources...

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Summary (2)

Competency Index for Linked Data

Who can benefit from it?

- **Students**: help choose courses that cover what you want to learn.

- **Instructors**: design a course, syllabus, homework, quizzes, exams.

- **Self-learners**: explore technologies and methods related to Linked Data.

- **Employers**: write a job description.

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Linked Data Competency Index is a work in progress!
Follow us on Github!

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

LD4PE Competency Index

Version: 2017-06-28 14:34:35
View at: https://dcmi.github.io/ldci/D2695955/

Code	Type	Definition
A	Topic Cluster	
B	Topic	
C	Competency	Tweet-length assertion of knowledge, skill, or habit of mi...
D	Benchmark	Action demonstrating accomplishment in related competencies.

Note: Hover over a code to see its URI. Click on a code to visit its full definition on the Achievement Standards Network website.
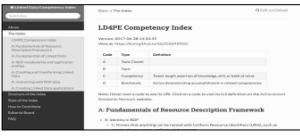
A: Fundamentals of Resource Description Framework

- B: Identity in RDF
  - C: Knows that anything can be named with Uniform Resource Identifiers (URIs), such as agents, places, events, artifacts, and concepts.

Editoral Board
- Tom Baker, chair
  Debbie Maron
  Kai Eckert
  Magnus Pfeffer
  Stuart Sutton

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Competency Index for Linked Data
Websites

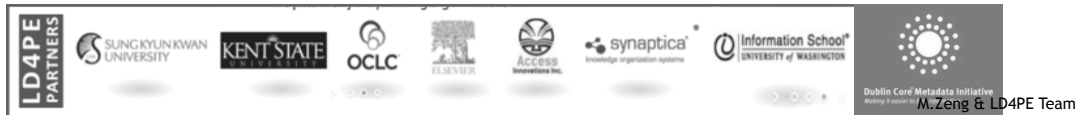| Available at:		Contents
LD4PE Project site: http://explore.dublincore.net/		• Competencies • Learning resources (aligned with competencies) • Roadmaps • Practice dataset and instruction
Maintenance at GitHub: https://dcmi.github.io/ldci/		• Competencies • Updates from the editorial board • Contribution by anyone is welcome
Registered at: Achievement Standards Network (ASN) http://asn.desire2learn.com/resources/D2695955		• Competencies • Definition, URI of each competency • Specification

---

References

- Linked Data for Professional Education (LD4PE); Explore Learning Resources by Competency http://explore.dublincore.net/

- Linked Data Competency Index https://dcmi.github.io/ldci/D2695955/

- Baker, Thomas. 2017. Linked Data Competency Index: Mapping the field for teachers and learners. FAO AIMS Webinar, 11 October 2017. http://aims.fao.org/capacity-development/webinars/webinaraimslinked-data-competency-index-mapping-field-teachers-and

- Crandall, Michael D., Stuart A. Sutton, Marcia Zeng, Thomas Baker, Abigail Evans, Sean Dolan, Joseph Chapman, David Talley, Michael Lauruhn. 2017. LD4PE: A Competency-based Guide to Linked Data Principles and Practices. DCMI Global Meetings & Conferences, DC-2017, Washington, D.C. http://dcevents.dublincore.org/IntConf/dc-2017/paper/view/513

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Thank you!

A Linked Data Competency Framework for Educators and Learners

http://explore.dublincore.net/

https://dcmi.github.io/ldci/

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On behalf of
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