Introduction to Linked Data

Lesson 1

A.G. Baumann, "Pygmy hippo and her new baby before a battery of press cameras, New York Zoological park," Library of Congress Prints and Photographs Division, accessed October 15, 2024, https://www.loc.gov/pictures/item/2015652321/

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Learning Objectives

- To identify the basic concepts behind the following
  - The Semantic Web
  - Linked Data
  - Resource Description Framework (RDF)
- To understand how linked data can benefit libraries
- To understand how linked data can affect your work

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The Semantic Web

…the [Semantic Web] is a comprehensive construct that includes three components:

the goal of making the web a global database dubbed the *Web of Data*, with the applications/interfaces necessary for its use;

the specifications developed or associated with this purpose, particularly those responsible for the so-called Web of Linked Data, which is understood as the web created by the connection of data using open standards;

and the set of procedures and rules, called Linked Data, for the publication of data in order to allow the connection of the same to other data from different sources and formats.

Luís Miguel Oliveira Machado, Renato Rocha Souza, and Maria da Graça Simões, "Semantic Web or Web of Data? A Diachronic Study (1999 to 2017) of the Publications of Tim Berners-Lee and the World Wide Web Consortium," *Journal of the Association for Information Science & Technology*, 70(7) (2019): 701-714, https://doi.org/10.1002/asi.24111

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Linked Data

Linked data is a publication technique using standard web technologies to connect related data and make them available on the Web by following principles recommended by Tim Berners-Lee.

María Hallo, Sergio Luján-Mora, Alejandro Maté, and Juan Trujillo, "Current state of Linked Data in digital libraries," *Journal of Information Science*, 42(2) (2016): 117-127, https://doi.org/10.1177/0165551515594729

Design Principles for Linked Data

1. Use Uniform Resource Identifiers (URIs) as names for things.
2. Use HTTP URIs so that people can look up those names.
3. When someone looks up a URI, they should be provided with useful information that follows standards (e.g., RDF).
4. Include links to other URIs so people and computers can discover more things.

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Resource Description Framework (RDF)

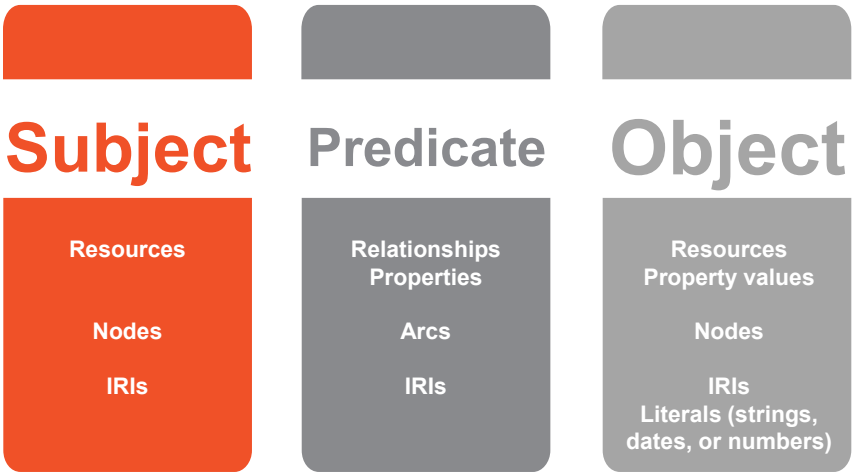
RDF is a standard model for data interchange on the Web.

RDF extends the linking structure of the Web to use URIs to **name the relationship between things as well as the two ends of the link** (this is usually referred to as a "triple"). Using this simple model, it allows **structured and semi-structured data** to be mixed, exposed, and shared across different applications.

The linking structure forms a directed, labeled graph, where the edges represent the named link between two resources, represented by the graph nodes.

"Resource Description Framework (RDF)," Semantic Web Standards, accessed October 11, 2024, https://www.w3.org/RDF/

RDF Triples



Simple Sample Statements

Subject	Predicate	Object
Carol	is a	person
Carol	lives in	Hawaii
Carol	is interested in	Moo Deng
Moo Deng	is a	pygmy hippopotamus
Moo Deng	was born on	July 10, 2024
Moo Deng	lives in	Thailand

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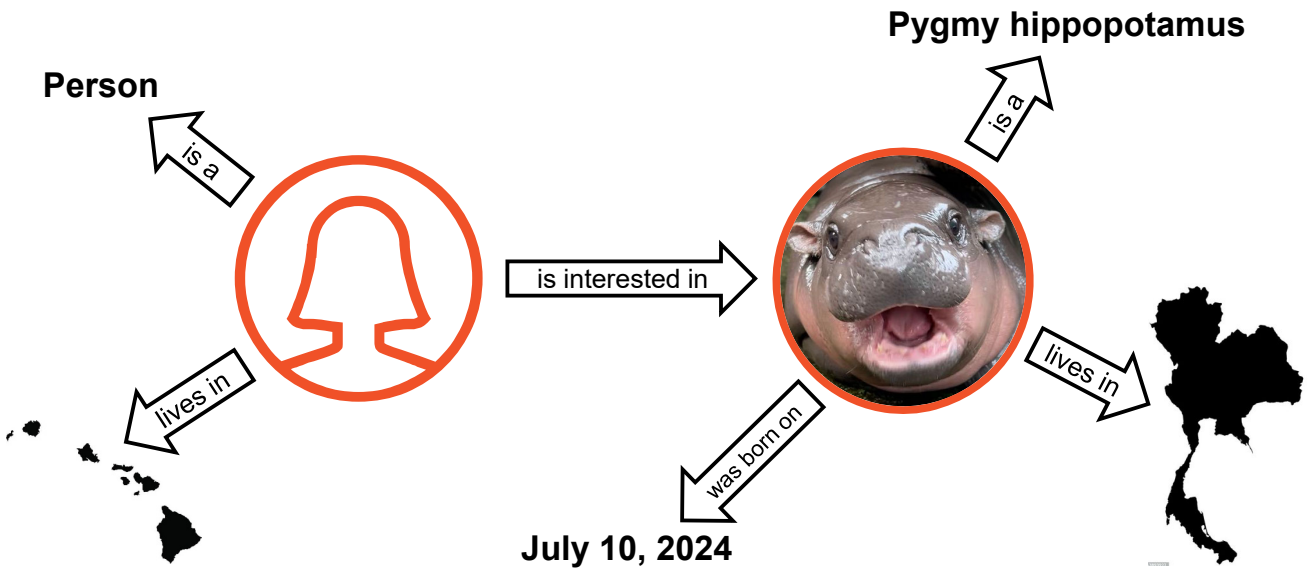
Graph



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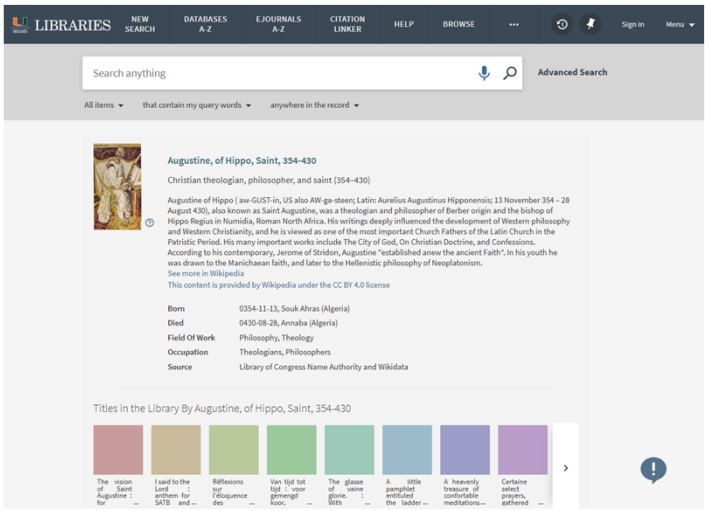
Knowledge Graphs

- Author panel from the University of Miami Libraries
- Data from Wikipedia, Wikidata, and the LC/NAF
- Titles in the library by the theologian and philosopher
- Titles in the library written about him
- People associated with him



Thank you for watching!

More information can be found at
https://staff.loc.gov/sites/lstraining/bibframe-training-for-lc-staff/