Building a Library Knowledge Graph: Using Linked and Structured Data for Web-Scale Discovery of Library People, Resources, and Services

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Head, Library Informatics & Computing
Montana State University (MSU) Library

Dartmouth College Library
March 30, 2017
pinboard.in tag

pinboard.in/u:jasonclark/t:lod/
Overview

• What is a library knowledge graph?
• Discovery and Machine Definitions
• Linked, structured data
• Web-scale Cataloging
• Case Study: Linked Resources
• Questions
What happens to libraries and librarians when machines can read all the books?

Chris Bourg, Director of Libraries at MIT

https://chrisbourg.wordpress.com/2017/03/16/what-happens-to-libraries-and-librarians-when-machines-can-read-all-the-books/
What if we considered how to make this happen in our everyday work?
Can we create a Machine UX?
What is a library?
A library is a collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection can include books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, Blu-ray Discs, e-books, audiobooks, databases, and other formats. Libraries range in size from a few shelves of books to several million items. In Latin and Greek, the idea of bookcase is represented by Bibliotheca and Bibliothēkē (Greek: βιβλιοθήκη): derivatives of these mean library in many modern languages, e.g. French bibliothèque.
A Collection?
Or a network of sources, people, and services?
An Expression of “Librariness”
The People
The Resources
### Browse Databases by Subject

Select a subject to view an annotated list of major article indexes and other sources (e.g., primary source & full-text collections, encyclopedias, image databases, datasets) in that discipline.

<table>
<thead>
<tr>
<th>Subject Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dartmouth Digital Collections</td>
</tr>
<tr>
<td>eBook Packages</td>
</tr>
<tr>
<td>Images</td>
</tr>
<tr>
<td>Newspapers and News</td>
</tr>
<tr>
<td>Reference (General)</td>
</tr>
<tr>
<td>African &amp; African-American Studies</td>
</tr>
<tr>
<td>Anthropology</td>
</tr>
<tr>
<td>Art &amp; Architecture</td>
</tr>
<tr>
<td>Asian Studies</td>
</tr>
<tr>
<td>Astronomy</td>
</tr>
<tr>
<td>Biology</td>
</tr>
</tbody>
</table>

### Browse Databases By Name

- A  B  C  D  E  F  G  H  I  J  K  L  M  N  O  P  Q  R  S  T  U  V  W  X  Y  Z  All titles

Find a database by name

[SUBMIT]
The Services
Services

- **Circulation Services**
- **Printers, Copiers, & Scanners (Baker-Berry and Sherman Libraries)** For information about printers, copiers, & scanners in other library locations, check each library's website.
- **Media Services** Help with multimedia equipment, training, software, and technical services.
- **Off-Campus Access** Configure your computer to access the Library's resources from anywhere in the world.
- **Accessibility Services** Library access for all members of the Dartmouth community.
- **Workshops**

Programs

- **Records Management** Providing consultation, guidance, policies, procedures, training, and storage solutions for the College's digital, microfilm and paper records.
- **Scholarly Publishing & Communication** Information about copyright, author rights, funding for open access publication, publishers' archiving policies, and publishers' contracts.

Library Spaces

- **Book A Baker-Berry Group Study Room**
  - [Baker-Berry Study Spaces](#) | [All Library Study Spaces](#)
- **Reserving Space in the Libraries** Instructional classrooms, scholar studies, and lockers are available.

Course Reserves
This network or graph can be expressed and encoded into our web site.
Discovery

Web-scale cataloging
SEO + Semantic Understanding
The Dartmouth College Library fosters intellectual growth and advances the mission of Dartmouth College and affiliated communities by supporting excellence...

Dig deeper. The extensive print and digital collections of Dartmouth's libraries serve as vital extensions of the campus's teaching and research facilities.

Need more help? Email help@dartmouth.edu or call 603-646-2999. Alumni should call 603-646-3202 for help. Where do I enter my password?close.

Jan 12, 2017 - Dartmouth College Library - decoration only; no semantic or contextual value ... the Library. Novack Café - Located in Berry Library, north end.

Feb 1, 2017 - Dartmouth College Library - decoration only; no semantic or ... Dartmouth Library Catalog - The Library's books, journals, media, maps, scores, ...
Library Blogs
- Starting at the Sun
  (Source: Rauner Special Collections Library)

Yet another snowy day in late March on campus has us casting our eyes in desperation to the sky in the vain hope of seeing a warm and welcoming sun. It also brings to mind another sun-worshipper who got his start gazing heavenward in Hanover. Charles Augustus Young, the best and
"Search engines continue to dominate, topping the list of electronic sources most used to find online content (93%), followed closely by Wikipedia (88%). The key difference in usage between search engines and Wikipedia is the frequency - 75% of students who use search engines do so daily, compared to 20% of those who use Wikipedia."


http://www.oclc.org/content/dam/oclc/reports/2010perceptions/2010perceptions_all_singlepage.pdf
http://www.oclc.org/content/dam/oclc/reports/2010perceptions/collegestudents.pdf
Website's Built-In Search Engine Just Pathetic

NEWS IN BRIEF · Science & Technology · Internet · ISSUE 49-30 · Jul 22, 2013

CHICAGO—Following several unsuccessful attempts to find a specific article on a national media website, readers confirmed Monday that the built-in search engine found in the upper-right-hand corner of the online publication is nothing short of useless. “For example, I wanted to find a story they did recently about Michael Bay, and so I typed in his name, but the first results that came up were articles about NASA, Jim Harbaugh, and aliens,” said longtime reader Courtney Dunning, who admitted to reporters she was surprised that a website with two decades of backlogged content would have such a poorly designed and ineffective method for accessing its archived material. “Searching for ‘Michael Bay’s new movie’ didn’t get me anywhere, either. In fact, even when I typed in the exact headline of the article, it told me no results could be found.” As of press time, Dunning had reportedly abandoned the website’s search bar, Googled what she was looking for, and found it on her first attempt.
As of press time, Dunning had reportedly abandoned the website’s search bar, Googled what she was looking for, and found it on her first attempt. 🌿
A Library Knowledge Graph at Montana State University (MSU) Library
Nodes in the Graph

1. Linked Resources (Open SESMO)
2. Linked People
3. Linked Digital Collections
4. Linked Services (pilot)
Machine Definitions

Library Things as Semantic Entities
How are people, resources, and services understood?
Applying the concept of linked data for our local community

Finding a real-world use-case for graph modeling using open source tools

What if our people, resources, and services could be discovered and understood?
A Case Study
Open SESMO
Linked Resources

Using Linked Data to Reshape the Library Database List

www.lib.montana.edu/resources
Dartmouth College Library Catalog

Account Login: Dartmouth Faculty, Staff & Students | DHMC, Guest & Affiliated Borrowers

Browse Databases by Subject

Select a subject to view an annotated list of major article indexes and other sources (e.g., primary source & full-text collections, encyclopedias, image databases, datasets) in that discipline.

Dartmouth Digital Collections
eBook Packages
Images
Newspapers and News
Reference (General)
---------------------
African & African-American Studies
Anthropology
Art & Architecture
Asian Studies
Astronomy
Biology

Browse Databases By Name

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | All titles

Find a database by name

Submit
Search Engine Optimization
Social Media Optimization
Linked, Structured Data
The Experiment

- Same collection
- Apply optimizations in stages
- Compare analytics over time
- Goal: increased traffic and more nuanced, semantic understanding of content by search engines

www.lib.montana.edu/resources
Mergent - Creating Global Financial Solutions
www.mergent.com/
Mergent, Inc. is a leading provider of business and financial data on global publicly listed companies. Based in the U.S, the company maintains a strong global ... Profile - Mergent Online - News Reports - Careers

Mergent Online
www.mergentonline.com/
Mergent Online Content. U.S. Company Data. A fully searchable database with financials details of over 25,000 active and inactive companies ... About Mergent Online - Forgot your Username/Password - Contact Us - Feedback

Mergent Online : Montana State University (MSU) Library
www.lib.montana.edu/Resources  Montana State University Library
★★★★★ 12,289 votes
Mergent Online provides access to company profiles and financial information with full text business profiles, quarterly and annual financials, EDGAR filings, and ...

Mergent Archives
www.mergentarchives.com/
Welcome to Mergent Archives™, Mergent Archives is an online database providing you with access to a vast, indexed collection of corporate and industry ...

Mergent Intellect
www.mergentintellect.com/
Mergent Online : Montana State University (MSU) Library
www.lib.montana.edu › Resources › Montana State University Library
★★★★★ 12,357 votes
Mergent Online provides access to company profiles and financial information with full
text business profiles, quarterly and annual financials, EDGAR filings, and ...

Mergent Online - LibGuides at Michigan State University ...
libguides.lib.msu.edu/c.php?g...p... › Michigan State University Libraries ›
Dec 8, 2015 - To search the ~23 million private companies, select D&B Private Company
Database. Now Includes Mergent Horizon and Mergent Bond ...

About our Mergent Databases - Mergent Databases ...
libguides.lib.msu.edu/mergent › Michigan State University Libraries ›
Dec 8, 2015 - ... to main content. Michigan State University ... What are the Mergent
Databases? Mergent Archives (previously WebReports). This resource is ...

Mergent Online - LibGuides at Michigan State University ...
libguides.lib.msu.edu/c.php?q=206616 › Michigan State University Libraries ›
Mar 22, 2016 - Notice to users of licensed database: "MERGENT ONLINE" Prohibition of
commercial use, and guidelines for acceptable use. The MSU ...
Wait, what... how?
New Markup and Website Architecture


2. Establish each item page for a library database or resource as a Product entity using the Product type from Schema.org.

3. Encode subject and topic vocabularies into all relevant pages for humans and machines using the External Enumerations (https://www.w3.org/wiki/WebSchemas/ExternalEnumerations), an extension that allows for external vocabularies to be encoded and referenced in an HTML page.

4. Establish URL patterns, set identifiers, and set canonical URL patterns along with XML sitemap for indexing.
Optimized Pages

- Collection Page [home page]
  - www.lib.montana.edu/resources/

- About Pages [about page, topics page]
  - www.lib.montana.edu/resources/about.php
  - www.lib.montana.edu/resources/topics.php

- Item Pages [individual record page]
  - www.lib.montana.edu/resources/about/31

- Sitemap and rel=canonical work
  - www.lib.montana.edu/resources/sitemap.xml
CollectionPage

About: Library Articles and Research Databases Collection

The Montana State University (MSU) Library Articles and Research Database collection contains over 240 databases which include over 100,000 magazines, periodicals, serials and journals and more than 250,000 e-books. Additional materials include peer-reviewed articles, sound recordings, film and video recordings, newspapers, business and industry information, maps, data, tutorials, and book reviews. These resources cover subjects such as agriculture, architecture, art, biography, genealogy, biology, books, reading, business, chemical engineering, biological engineering, chemistry, biochemistry, children’s literature, civil engineering, computer science, earth sciences, ecology, English, environmental science, film, photography, government information, health, human development, history, and law. Other topics found include math, statistics, mechanical engineering, industrial engineering, modern languages, music, Native American studies, nursing, medicine, philosophy, physics, political science, psychology, religious studies, sociology, criminal justice, women’s studies, gender studies, sexuality studies, writing, composition, reference, and multidisciplinary areas.

These resources are made available to the faculty, staff, graduate students, and undergraduate students of Montana State University and Gallatin College. Additionally, individuals from the Bozeman area community may walk-in to the Renne Library to use these resources inside the library building.

MSU Library provides access to these resources in support of the teaching and research of its Gallatin County community. These items are made accessible on campus and anywhere with an Internet connection, whether from a dorm room, a coffee shop, a cell phone, or a wireless connection. These resource subscriptions are funded by Montana State University Library in support of the University’s mission.
AboutPage

Mergent Online

What is it? Mergent Online provides access to company profiles and financial information with full text business profiles, quarterly and annual financials, EDGAR filings, and recent press releases and newswire reports. Updated daily.

Liaison(s):
- Greg Notess

Linked Data Topics:
- Accounting
- Business

Related Databases:
- Vault Career Library
- Business Source Complete
- EconLit
- IBISWorld Industry Research Reports
- LexisNexis Academic

Total interactions: 12330

Rank: 18 out of 248 (based on 12330 out of 1323353 total interactions with all of our databases)
ItemPage -> Product

https://www.lib.montana.edu/resources/about/238
# Product

**Thing > Product**

Any offered product or service. For example: a pair of shoes; a concert ticket; the rental of a car; a haircut; or an episode of a TV show streamed online.

Usage: Over 1,000,000 domains

<table>
<thead>
<tr>
<th>Property</th>
<th>Expected Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>additionalProperty</td>
<td>PropertyValue</td>
<td>A property-value pair representing an additional characteristics of the entity, e.g. a product feature or another characteristic for which there is no matching property in schema.org.</td>
</tr>
<tr>
<td>aggregateRating</td>
<td>AggregateRating</td>
<td>The overall rating, based on a collection of reviews or ratings, of the item. Supersedes serviceAudience.</td>
</tr>
<tr>
<td>audience</td>
<td>Audience</td>
<td>An intended audience, i.e. a group for whom something was created. Supersedes serviceAudience.</td>
</tr>
<tr>
<td>award</td>
<td>Text</td>
<td>An award won by or for this item. Supersedes awards.</td>
</tr>
<tr>
<td>brand</td>
<td>Brand or Organization</td>
<td>The brand(s) associated with a product or service, or the brand(s) maintained by an organization or business person.</td>
</tr>
</tbody>
</table>
External Enumerations

"We define here some specific integration points through which selected externally maintained vocabulary can be published as part of schema.org markup"

www.w3.org/wiki/WebSchemas/ExternalEnumerations
Wikipedia (DBpedia) as a Controlled Vocabulary
### Search

**Select Field:** Personal Names  
**Select Index:** All VIAF  
**Search Terms:** jason a clark

2 headings found for *jason a clark*

<table>
<thead>
<tr>
<th>Heading</th>
<th>Type</th>
<th>Sample Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Clark, Jason A.</td>
<td>Personal</td>
<td>Building mobile library applications</td>
</tr>
<tr>
<td>2 Clark, Jason A., 1975-</td>
<td>Personal</td>
<td>Florence</td>
</tr>
</tbody>
</table>

© 2010-2014 OCLC
Privacy Policy
Hosted by OCLC
About the Dataset
Jason A. Clark

Country: United States
Keywords: machine learning - information architecture
Websites:
- http://www.jasonclark.info
- https://github.com/jasonclark

Personal Information

Biography
Associate Professor, Montana State University

Works
additionalTypes, category

<dd property="additionalType" resource="http://dbpedia.org/resource/Accounting"><a property="additionalType" href="https://en.wikipedia.org/wiki/Accounting"><span property="category">Accounting</span></a></dd>
<dd property="additionalType" resource="http://dbpedia.org/resource/Business"><a property="additionalType" href="https://en.wikipedia.org/wiki/Business"><span property="category">Business</span></a></dd>

https://schema.org/additionalType, http://schema.org/specialty
Technical SEO: Sitemap and rel=canonical
Sitemap - https://www.lib.montana.edu/resources/sitemap.xml
Establish Preferred URL for Indexing

<link rel="canonical" href="https://www.lib.montana.edu/resources/about/116" />

Further reading:
Using Canonical URLs
https://support.google.com/webmasters/answer/139066
Social Media Optimization
Twitter Card and Facebook Open Graph Tagging

<!--Begin social media tags and metadata-->
<meta name="twitter:title" content="Art Abstracts">
<meta name="twitter:description" content="Art Abstracts - Montana State University (MSU) Library">
<meta name="twitter:image:src" content="http://www.lib.montana.edu/resources/meta/img/screenshots/14.jpg">
<meta name="twitter:url" content="http://www.lib.montana.edu/resources/about/14">
<meta name="twitter:card" content="summary_large_image">
<meta name="twitter:site" content="@msulibrary">
<meta name="twitter:creator" content="@msulibrary">
<meta property="og:title" content="Art Abstracts">
<meta property="og:description" content="Art Abstracts - Montana State University (MSU) Library">
<meta property="og:image" content="http://www.lib.montana.edu/resources/meta/img/screenshots/14.jpg">
<meta property="og:url" content="http://www.lib.montana.edu/resources/about/14">
<meta property="og:type" content="website" />
<meta property="og:site_name" content="Art Abstracts - Montana State University (MSU) Library"/>
<!-- End social media tags and metadata -->
Results
Semantic Understandings
## Structured Data

**Status:** 3/30/16

- **423** Items on 147 pages
- **0** Items with Errors on 0 pages

### Data Type

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Source</th>
<th>Pages</th>
<th>Items</th>
<th>Items with Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>WebPage</td>
<td>Markup: schema.org</td>
<td>147</td>
<td>147</td>
<td>-</td>
</tr>
<tr>
<td>ItemPage</td>
<td>Markup: schema.org</td>
<td>146</td>
<td>146</td>
<td>-</td>
</tr>
<tr>
<td>Person</td>
<td>Markup: schema.org</td>
<td>129</td>
<td>129</td>
<td>-</td>
</tr>
<tr>
<td>CollectionPage</td>
<td>Markup: schema.org</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Product</td>
<td>Markup: schema.org</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>AboutPage</td>
<td>Markup: schema.org</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>
## Structured Data

**Status:** 3/27/17

- **263** Items on 88 pages
- **0** Items with Errors on 0 pages

### Data Type

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Source</th>
<th>Pages</th>
<th>Items</th>
<th>Items with Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>WebPage</td>
<td>Markup: schema.org</td>
<td>88</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>Person</td>
<td>Markup: schema.org</td>
<td>87</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>ItemPage</td>
<td>Markup: schema.org</td>
<td>87</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>CollectionPage</td>
<td>Markup: schema.org</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Database Recommendations
Mergent Online

What is it? Mergent Online provides access to company profiles and financial information with full text business profiles, quarterly and annual financials, EDGAR filings, and recent press releases and news wire reports. Updated daily.

Liaison(s):
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Business

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LexisNexis Academic

Total interactions: 12330

Rank: 18 out of 248 (based on 12330 out of 1323353 total interactions with all of our databases)
Search Engine Result Pages
Mergent Online

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Mergent - Creating Global Financial Solutions
www.mergent.com/
Mergent, Inc. is a leading provider of business and financial data on global publicly listed companies. Based in the U.S, the company maintains a strong global ...
Profile - Mergent Online - News Reports - Careers

Mergent Online
www.mergentonline.com/
Mergent Online Content. U.S. Company Data. A fully searchable database with financials details of over 25,000 active and inactive companies ...
About Mergent Online - Forgot your Username/Password - Contact Us - Feedback

Mergent Online : Montana State University (MSU) Library
www.lib.montana.edu/Resources Montana State University Library
★★★★★ 12,289 votes
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Mergent Archives
www.mergentarchives.com/
Welcome to Mergent Archives™, Mergent Archives is an online database providing you with access to a vast, indexed collection of corporate and industry ...

Mergent Intellect
www.mergentintellect.com/
All rights reserved. EEO/AA/5/F/Vets/Disabled Version 3.0.24.
Looking for high-quality art images? ArtStor includes architecture, painting, sculpture, photography, design, & more
lib.montana.edu/resources/about...
Looking for high-quality art images? ArtStor includes architecture, painting, sculpture, photography, design, & more
lib.montana.edu/resources/about...
Social Media Analytics
Looking for high-quality art images? ArtStor includes architecture, painting, sculpture, photography, design, & more
lib.montana.edu/resources/about...
Organic Search Statistics
<table>
<thead>
<tr>
<th>Pages</th>
<th>Total clicks</th>
<th>Total impressions</th>
<th>Avg. CTR</th>
<th>Avg. position</th>
</tr>
</thead>
<tbody>
<tr>
<td>/about/120</td>
<td>352</td>
<td>10,538</td>
<td>3.34%</td>
<td>4.8</td>
</tr>
<tr>
<td>/about/315</td>
<td>317</td>
<td>25,407</td>
<td>1.25%</td>
<td>3.0</td>
</tr>
<tr>
<td>/</td>
<td>312</td>
<td>9,676</td>
<td>3.22%</td>
<td>3.0</td>
</tr>
<tr>
<td>/about/102</td>
<td>27</td>
<td>209</td>
<td>12.92%</td>
<td>3.7</td>
</tr>
<tr>
<td>/about/156</td>
<td>27</td>
<td>471</td>
<td>5.73%</td>
<td>9.5</td>
</tr>
<tr>
<td>/about/214</td>
<td>16</td>
<td>193</td>
<td>8.26%</td>
<td>4.6</td>
</tr>
<tr>
<td>/about/107</td>
<td>15</td>
<td>180</td>
<td>8.33%</td>
<td>30.8</td>
</tr>
</tbody>
</table>
Initial snapshot

August 16, 2015 to September 12, 2015
versus
September 13, 2015 to October 10, 2015

13,881 total impressions to 54,172 total impressions

“Clickthrough Rates” and “Search Position” show growth
User Growth

August 22, 2014 to November 4, 2016

Total users (audience - overview)

2014 - 11,833
2015 - 13,128
2016 - 24,657
<table>
<thead>
<tr>
<th>Channel Grouping</th>
<th>Sessions</th>
<th>% New Sessions</th>
<th>New Users</th>
<th>Bounce Rate</th>
<th>Pages / Session</th>
<th>Avg. Session Duration</th>
<th>Find Page Click-through Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMT about</td>
<td>5,420.00%</td>
<td>0.12%</td>
<td>5,426.60%</td>
<td>100.00%</td>
<td>89.95%</td>
<td>84.90%</td>
<td>92.64%</td>
</tr>
<tr>
<td>RMT</td>
<td>0.29%</td>
<td>15.05%</td>
<td>14.80%</td>
<td>56.92%</td>
<td>36.43%</td>
<td>40.16%</td>
<td>73.24%</td>
</tr>
</tbody>
</table>

### Organic Search

- **Aug 24, 2015 - Mar 29, 2016**
  - RMT about: 6,235 (61.06%), 66.22%, 4,129 (79.48%), 74.63%, 1.73, 00:01:07, 4.04%
  - RMT: 18,564 (26.99%), 39.92%, 7,411 (43.67%), 40.93%, 2.82, 00:01:51, 14.60%

  - RMT about: 47 (25.41%), 63.83%, 30 (31.91%), 0.00%, 15.57, 00:13:23, 57.45%
  - RMT: 17,909 (26.12%), 48.79%, 8,738 (43.86%), 36.88%, 3.89, 00:02:54, 43.69%

### Referral

- **Aug 24, 2015 - Mar 29, 2016**
  - RMT about: 3,494 (34.21%), 20.49%, 716 (13.78%), 58.56%, 2.81, 00:02:34, 6.35%
  - RMT: 41,876 (60.89%), 13.21%, 5,530 (32.58%), 16.18%, 3.63, 00:02:35, 20.75%
Organic Search Growth

August 22, 2015 to March 29, 2016

Search/Referrals for all resource pages
(acquisition - source/medium)

68,742 sessions
to
78,986 sessions
Organic Search Growth

August 22, 2014 to November 4, 2016

Search/Referrals for about/item pages
(acquisition - source/medium)

2014 - 94
2015 - 3,659
2016 - 3,580
Overall Page Metrics
Aug 24, 2015 - Mar 29, 2016: 5,420.54% Sessions
Aug 25, 2014 - Mar 30, 2015: 3,850.00% Sessions

Sessions
RMT about
5,420.54%
10,213 vs 185

Users
RMT about
3,850.00%
7,031 vs 178

Pageviews
RMT about
454.77%
21,991 vs 3,964

Pages / Session
RMT about
-89.95%
2.15 vs 21.43

Avg. Session Duration
RMT about
-84.90%

Bounce Rate
RMT about
100.00%
Item Pages

August 24, 2015 to March 29, 2016
(compared to previous year)

185 total impressions to 10,200 total impressions
Item Pages

August 22, 2014 to November 4, 2016

2014 - 2,924
2015 - 7,807
2016 - 13,191
Item Pages - Exit Rates

August 22, 2014 to November 4, 2016

Pages per/session decrease
and
3% to 45% to 50% exit rate
What about those other nodes in the graph?
Linked Data is People

Using Linked Data to Reshape the Library Staff Directory

www.lib.montana.edu/people
Departments & Staff Directory

Search for Library staff by name, title, or department:
- Dean of Libraries
- Administration
- Departments
- Staff Directory
- Subject Librarians
- Organization Charts
- Committees and Working Groups
Jan Zauha

Title: Outreach Librarian [Professor]
Department: Learning and Research Services,
Montana State University
Phone: 406-994-6554
Email: jzauha@montana.edu
Calendar: Schedule Appointment

Room: 117C

Vita

Get QR Embed Code

http://www.lib.montana.edu/people/about/47#person
{ "@context": "http://schema.org", "@type": "Person", "name": "Jan Zauha", "jobTitle": "Outreach Librarian [Professor] ", "workLocation": "Learning and Research Services", "email": "jzauha@montana.edu", "image": "http://shelf.lib.montana.edu/people/meta/img/photos/janzauha-thumb.jpg", "telephone": "406-994-6554", "address": { "@type": "PostalAddress", "addressLocality": "Bozeman", "addressRegion": "MT", "postalCode": "59717-3320", "streetAddress": "P.O. Box 173320" }, "colleague": [ "shelf.lib.montana.edu/people/2", "shelf.lib.montana.edu/people/4", "shelf.lib.montana.edu/people/17", "shelf.lib.montana.edu/people/28", "shelf.lib.montana.edu/people/33", "shelf.lib.montana.edu/people/40", "shelf.lib.montana.edu/people/79", "shelf.lib.montana.edu/people/47", "shelf.lib.montana.edu/people/82", "shelf.lib.montana.edu/people/88", "shelf.lib.montana.edu/people/101", "shelf.lib.montana.edu/people/135", "shelf.lib.montana.edu/people/138", ], "sameAs": [ "http://scholar.google.com/citations?user=htx7S9oAAAAJ&hl=en", "" ], "worksFor": "Montana State University (MSU)" }
Jan Zauha is defined/understood as an entity
Similar Impact and Results
“Google Analytics reporting shows an increase in key metrics for our staff directory when comparing the Fall academic term of 2013 (August 26-December 13) with the Fall academic term of 2014 (August 25-December 12), representing pre and post periods for this project. Overall sessions increased by 280% (601 in Fall 2013 to 2,288 in Fall 2014) and overall visitors increased by 240% (530 to 1,801); inbound sessions from organic search increased by 436% (221 to 1,131), and inbound sessions specifically from Google Search increased by 441% (203 to 1,099). Google Analytics reporting from the Fall academic terms in 2015 (August 24-December 11) and 2016 (August 29-December 16) show that the gains in sessions, visitors, and search traffic have been sustained.”

From: “Linked Data is People: Building a Knowledge Graph to Reshape the Library Staff Directory” Code4lib Journal, April 2017
New Search and Browse
Connecting our Services to the Library Knowledge Graph
Research and Instruction Services

A team of faculty research and instruction librarians specializing in information science and diverse subject areas provides information, instruction, and guidance on retrieving all types of information. We help with the use of all library resources and technology, while promoting information literacy and enabling lifelong learning. We serve the MSU community, the citizens of Montana, and others. Talk with us at the Research Center Desk (located on the first floor of the Renne Library) or contact us via telephone, text, email, chat, or by appointment.

Research Services

- Live, one-on-one personalized assistance at the Research Center Desk and through our Research Consultation Program
- Computers with access to Internet and all online library resources, along with Word, Excel, and PowerPoint and access to student Z drives
- Laser printers (250 free pages each semester on your CatCard)
- The latest dictionaries, encyclopedias, directories, handbooks, atlases, and many other print sources for statistical, bibliographic, and background information
- Research Consultations one-on-one consultation sessions are available by appointment

Instructional Services

Collaborate with librarians to improve your or your students' research and

https://www.lib.montana.edu/services/research-and-instruction
A team of faculty research and instruction librarians specializing in information science and diverse subject areas provides information, instruction, and guidance on retrieving all types of information. We help with the use of all library resources and technology, while promoting information literacy and enabling lifelong learning. We serve the MSU community, the citizens of Montana, and others. Talk with us at the Research Center Desk (located on the first floor of the Renne Library) or contact us via telephone, text, email, or by appointment.

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A machine address that can be referenced and linked in other applications.
Jan Zauha
Title: Outreach Librarian [Professor]
Department: Learning and Research Services,
Montana State University
Phone: 406-994-6554
Email: jzauha@montana.edu
Calendar: Schedule Appointment

Room: 117C
Vita
Get QR Embed Code

http://www.lib.montana.edu/people/about/47#person
makesOffer
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A team of faculty research and instruction librarians specializing in information science and diverse subject areas provides information, instruction, and guidance on retrieving all types of information. We help with the use of all library resources and technology, while promoting information literacy and enabling lifelong learning. We serve the MSU community, the citizens of Montana, and others. Talk with us at the Research Center Desk (located on the first floor of the Renne Library) or contact us via telephone, text, email, chat, or by appointment.

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Collaborate with librarians to improve your or your students' research and

https://www.lib.montana.edu/services/research-and-instruction/#service
Where to start?
Humans + Bots
A teaching moment
A cataloging moment
A discovery moment
What happens to libraries if machines can read all representations of the library?

Hat tip: Chris Bourg @mchris4duke
5 Star Linked Open Data

- make your stuff available on the Web (whatever format) under an open license
- make it available as structured data (e.g., Excel instead of image scan of a table)
- use non-proprietary formats (e.g., CSV instead of Excel)
- use URIs to denote things, so that people can point at your stuff
- link your data to other data to provide context

http://5stardata.info/
Why Linked Open Data?

- Libraries as publishers in Web of Data
- Reuse of our data = Significance
- Can improve findability in search engines (search engine optimization)
- Levels of description in LOD enable entirely new applications
A Machine UX Program?
getSEMantic [beta]
jason a. clark

Feed me a URL  Get Analysis

Key:  Demo App  What is this?  View Code  @jaclark  Credit
The opportunity to (re)define ourselves and our work
Acknowledgements

I would like to thank Alison Hitchens for her excellent work in explaining and teaching linked data concepts and definitions.

http://www.accessola2.com/olita/insideolita/wordpress/?p=60029

She was also gracious enough to distribute her work under the Attribution-Noncommercial-Share Alike 3.0 Unported license. And I am doing the same.
A Research Team Effort

Scott Young: Digital Initiatives Librarian at Montana State University. @hei_scott

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Patrick O’Brien: Semantic Web Research Director at Montana State University Library.

Kenning Arlitsch: Dean of the Library at Montana State University @kenning_msu

Doralyn Rossmann
Head, Collection Development
Montana State University Library
https://doralyn.org/
@doralyn
Resources


Koster, Lukas (2011) Brief Introduction to Linked Data (open access) https://docs.google.com/document/d/1W6UOCLgxTyM0BIPfd5hs58dh4k6CUdLW354AjjtnJfk/edit

*See also LODLAM - Linked Open Data in Libraries, Archives & Museums at http://lodlam.net/
Questions?

twitter.com/jaclark
www.lib.montana.edu/~jason/talks.php