

Introduction to Schema.org and JSON-LD



Schema.org

What is it?

Schema.org is a set of vocabularies for describing things in an interoperable and semantic way on the web.

Historical Context

- Started in 2011 by Google, Yahoo, Bing
- Maintained by members of Google, Yahoo, Bing, Yandex
- Original scope was for businesses
- Community driven

Purpose

- “[To] create and support a common set of schemas for structured data markup on web pages.”*
- To make data on the web more meaningful to machines

* <https://webmasters.googleblog.com/2011/06/introducing-schemaorg-search-engines.html>

Item information

Title:

Brothers of the Omega Psi Phi Fraternity in step routine

Topics:

[Student Life](#)

Subjects:

[African American fraternal organizations](#)

[College students -- Societies, etc.](#)

[Dance](#)

[Dogs](#)

[Fraternal organizations](#)

[Performances](#)

[Students -- Societies, etc.](#)

Original Format:

[Black-and-white print \(photograph\)](#)

Extent:

8 x 10 inches

Item identifier:

0021721

Photographer:

[Lodge, Rick](#)

Created Date:

1981-10-01

Description:

Information from The Technician newspaper, dated October 7, 1981: Louis Cade [with dog] leads his Omega Psi Phi brothers in a step routine before 400 onlookers in front of the free expression tunnel.

Genre:

[Photographs](#)

Names:

[North Carolina State University -- Students](#)

[Omega Psi Phi Fraternity](#)

Location:

[Raleigh \(N.C\)](#)

Digital Project:

[University Archives Photographs](#)

Photograph

Person

Place



Image

Schema.org

<https://www.google.com/search?q=The+Dark+Tower>

8

THE DARK TOWER

- OVERVIEW
- MOVIE TIMES + TICKETS
- SYNOPSIS
- MOVIE REVIEWS
- TRAILERS
- MORE

Released

AUGUST 4, 2017

PG-13, 1 hr 35 min

Horror

Sci-Fi/Fantasy

★★★★☆

3,021 Fan Ratings

16%

Rotten Tomatoes™

TELL US WHERE YOU ARE

Looking for movie tickets? Enter your location to see which movie theaters are playing *The Dark Tower* near you.

ENTER ZIP OR CITY, STATE

Elements
Console
Sources
Network
Performance
Memory
Application
Security
Audits

```

<meta name="twitter:image:gradient" content="http://images.fandango.com/images/twzctcr/overcity.png"
<meta name="twitter:image:gradient:width" content="593">
<meta name="twitter:image:gradient:height" content="650"> == $0
</meta>
<span itemprop="name" itemscope itemtype="http://schema.org/Movie">
  <meta itemprop="name" content="The Dark Tower">
  <meta itemprop="url" content="http://www.fandango.com/thedarktower_185723/movieoverview">
  <meta itemprop="image" content="https://images.fandango.com/r1.0.80/ImageRenderer/164/250/redesign/
static/img/default_poster.png/0/images/masterrepository/fandango/185723/
dt_dom_online_1sht_tsr.jpg">
  <meta itemprop="description" content="Gunslinger Roland Deschain roams an Old West-like landscape
in search of a dark tower, in the hopes that reaching it will preserve his dying world.">
  <meta itemprop="duration" content="PT1H35M">
  <meta itemprop="productionCompany" content="
  <meta itemprop="contentRating" content="PG-13">
  <meta itemprop="genre" content="Horror">
  <meta itemprop="genre" content="Sci-Fi/Fantasy">
  <meta itemprop="datePublished" content="2017-08-04">
  <!--Provide if this is a movie page -->
  <meta itemprop="typicalAgeRange" content">
  <span itemprop="director" itemscope itemtype="http://schema.org/Person"></span>
  <span itemprop="actor" itemscope itemtype="http://schema.org/Person"></span>
  <span itemprop="actor" itemscope itemtype="http://schema.org/Person"></span>
  <span itemprop="actor" itemscope itemtype="http://schema.org/Person"></span>
  <span itemprop="actor" itemscope itemtype="http://schema.org/Person"></span>
  <span itemprop="actor" itemscope itemtype="http://schema.org/Person"></span>
  <span itemprop="trailer" itemscope itemtype="http://schema.org/VideoObject"></span>
  <span itemprop="aggregateRating" itemscope itemtype="http://schema.org/AggregateRating"></span>
</span>
<span itemprop="Trailer" itemscope itemtype="http://schema.org/VideoObject">
  <meta itemprop="name" content="The Dark Tower: International Trailer 2">
  <meta itemprop="description" content">
  <meta itemprop="url" content="http://www.fandango.com/movie-trailer/thedarktower:
internationaltrailer2-trailer/185723">
  <meta itemprop="image" content="https://images.fandango.com/r1.0.80/imagerelay/121/87/
statcdn.fandango.com%2fMPX%2fimage%2fNBCU_Fandango%2f168%2f910%2fthedarktower_internationaltrailer2
.jpg/image.jpg/redesign/static/img/noxSquare.jpg">
  <meta itemprop="duration" content="PT0H1M32S">
  <meta itemprop="contentUrl" content="http://link.theplatform.com/s/NGweTC/media/joL_ZfSorSdb">
  <meta itemprop="embedUrl" content="https://www.fandango.com/videos/player?emb=user&w=620&rt=PG-
13&genre=Horror,Sci-Fi/Fantasy&title=The Dark Tower &mid=185723&h=349">
  <meta itemprop="description" content">
  <meta itemprop="thumbnailUrl" content="https://statcdn.fandango.com/MPX/image/NBCU_Fandango/168/
910/thedarktower_internationaltrailer2.jpg">
  <meta itemprop="uploadDate" content="2017-07-10">
</span>

```

what makes a supercomputer so super



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About 2,180,000 results (0.41 seconds)

What makes a supercomputer so super? - Server Hardware ...

<https://community.spiceworks.com/.../1071051-what-makes-a-supercomputer-so-supe...>

Jul 16, 2015 - 25 posts - 21 authors

A **supercomputer** is just what its name suggests – a computer with ... Newegg reports that Tianhe-2 is "so powerful that it's able to perform ...

People also ask

What is a super computer?



How much does it cost to build a supercomputer?



How does a super computer work?



What is the use of a supercomputer?



Feedback

What Makes a Supercomputer so Super? | NCSU Libraries

<https://www.lib.ncsu.edu/events/what-makes-a-supercomputer-so-super>

Supercomputers play an important role in the field of computational science and are used for a wide range of computationally intensive tasks in various fields ranging from basic science to finance.

Upcoming Events | What Makes a Supercomputer So Super? | College ...

<https://sciences.ncsu.edu/event/what-makes-a-supercomputer-so-super/>

Supercomputers play an important role in the field of computational science and are used for a wide range of computationally intensive tasks in various fields ranging from basic science to finance.

Tue, Nov 7 D.H. Hill Library, Multimedia Seminar Center

<https://www.google.com/search?q=what+makes+a+supercomputer+so+super>

Montana State University Databases

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American West: Sources from the Everett D. Graff Collection



American West: Sources from the Everett D. Graff Collection

What is it? The Graff Collection from the Newberry Library in Chicago is a unique resource which will allow maps, ephemeral material and rare printed sources, this collection will act as a dynamic teaching and re

Why use it? To find primary documents relating to the history of the American West

Coverage: 1700s-mid 1900s

Access: Unlimited users. Available on networked computers on the MSU campus and via the proxy serve

Vendor: Adam Matthew

Learn more: Adam Matthew Digital

Subjects: Agriculture, History, Native American Studies

Liaison(s):

Linked Data Topics:

Agriculture
History
Primary source

RdFa POSH

Statement Collection #5

Entity [product](#)

Attributes

[rdf:type](#) [schema:Product](#)

[Name](#) "American West: Sources from the Everett D. Graff Collection"@en-US

[schema:image](#)

[schema:description](#) "The Graff Collection from the Newberry Library in Chicago is a unique resource which will allow scholars to explore many areas of history in the American West. Through a mixture of original manuscripts, maps, ephemeral material and rare printed sources, this collection will act as a dynamic teaching and research resource."@en-US

[schema:brand](#) "Adam Matthew"@en-US

[schema:manufacturer](#) "Adam Matthew"@en-US

[schema:category](#) "Agriculture, History, Native American Studies"@en-US

[schema:category](#) "Agriculture"@en-US

[schema:category](#) "History"@en-US

[schema:category](#) "Primary source"@en-US

[schema:additionalType](#) [dbpedia:Agriculture](#)

[schema:additionalType](#) <https://en.wikipedia.org/wiki/Agriculture>

[schema:additionalType](#) [dbpedia:History](#)

[schema:additionalType](#) <https://en.wikipedia.org/wiki/History>

[schema:additionalType](#) [dbpedia:Primary_source](#)

ver: 2.15.2 [OpenLink Structured Data Sniffer](#) Copyright © 2015-2017 [OpenLink Software](#)

<http://www.lib.montana.edu/resources/about/482>



American West: Sources from the Everett D. Graff Collection



All

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More

Settings

Tools

About 17,900 results (1.21 seconds)

American West: Sources from the Everett D. Graff Collection : Montana ...

www.lib.montana.edu > Resources ▼

★★★★★ Rating: 3.5 - 4,380 votes

Aug 1, 2017 - The **Graff Collection** from the Newberry Library in Chicago is a unique resource which will allow scholars to explore many areas of history in the ...

Usage by Big Engines

[Schema.org: Evolution of Structured Data on the Web](#)

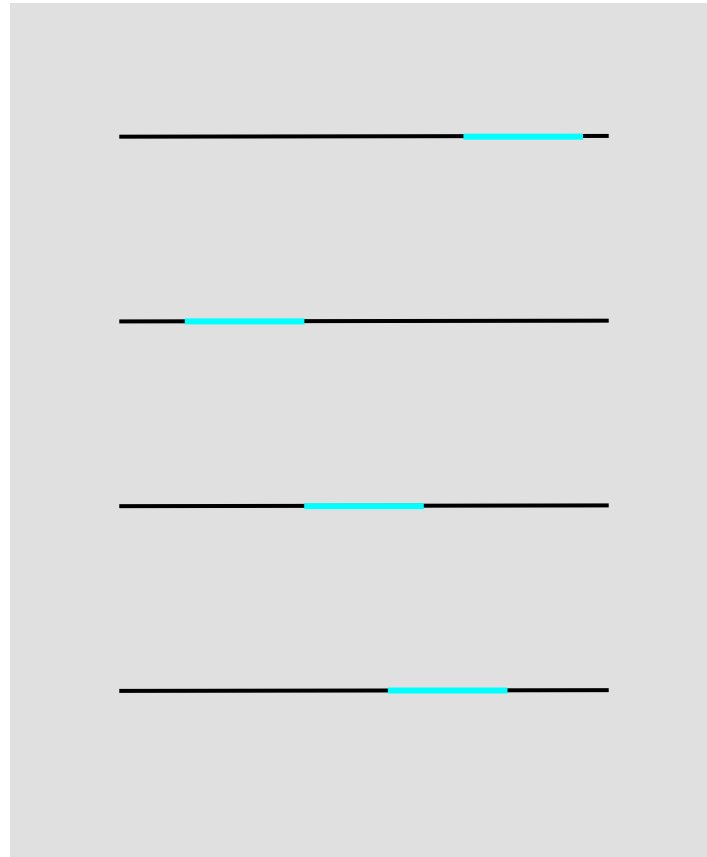
[Google - Introduction to Structured Data](#)

Impact on Library SEO

The Open SESMO (Search Engine & Social Media Optimization) Project: Linked and Structured Data for Library Subscription Databases to Enable Web-scale Discovery in Search Engines

Linked Data is People: Building a Knowledge Graph to Reshape the Library Staff Directory

Semantic Markup



Person Example: Without Markup

<p>George Bush, the 41st President of the United States is the father of George W. Bush, the 43rd President of the United States.</p>

<http://schema.org/Person>

Person Example: JSON-LD Syntax

Example 4

Without Markup

Microdata

RDFa

JSON-LD

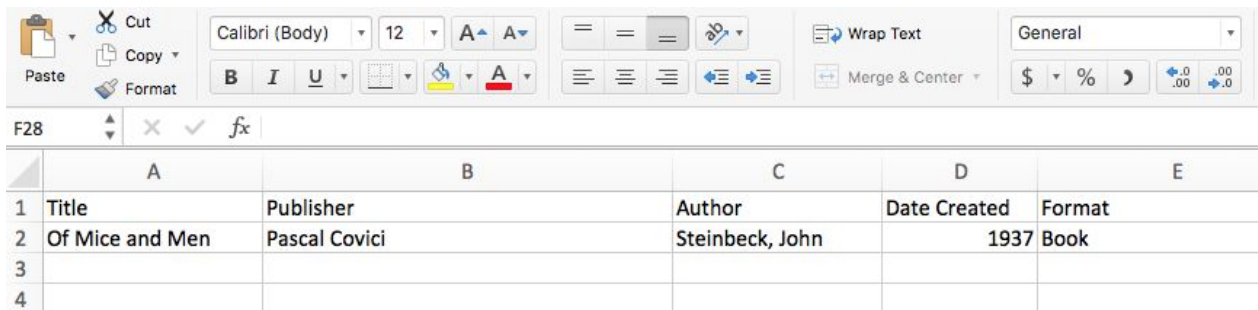
```
<script type="application/ld+json">
{
  "@context": "http://schema.org",
  "@type": "Person",
  "name": "George Bush",
  "disambiguatingDescription": "41st President of the United States",
  "children": {
    "@type": "Person",
    "name": "George W. Bush",
    "disambiguatingDescription": "43rd President of the United States"
  }
}
</script>
```

<http://schema.org/Person>

JSON Basics

- JavaScript Object Notation is a data format
- Based on a subset of the JavaScript Programming Language
- Text based and language independent

JSON Example



The screenshot shows the Microsoft Excel interface. The ribbon at the top includes the 'Home' tab with options for Paste, Cut, Copy, Format, and various font and alignment settings. The formula bar shows 'F28'. Below the ribbon is a table with 5 columns (A-E) and 4 rows (1-4). The data in the table is as follows:

	A	B	C	D	E
1	Title	Publisher	Author	Date Created	Format
2	Of Mice and Men	Pascal Covici	Steinbeck, John	1937	Book
3					
4					

```
1  {
2    "Title": "Of Mice and Men",
3    "Publisher": "Pascal Covici",
4    "Author": "Steinbeck, John",
5    "DateCreated": "1937",
6    "Format": "Book"
7  }
```

JSON-LD Extension

- Lightweight linked data format
- Extends JSON
- [JSON-LD homepage](#)

Describing a Painting

with schema.org in JSON-LD

JSON

{ }

JSON-LD

```
{  
  "@context": "http://schema.org",  
  "@type": "Painting"  
}
```

<http://schema.org/docs/jsonldcontext.json>

JSON-LD with Properties

```
{  
  "@context": "http://schema.org",  
  "@type": "Painting",  
  "name": "The Scream",  
  "url": "https://en.wikipedia.org/wiki/The_Scream",  
  "creator":  
}
```

Nested Properties

creator

Organization or
Person

The **creator**/author of this CreativeWork. This is the same as the Author property for CreativeWork.

JSON-LD with Nesting

```
{
  "@context": "http://schema.org",
  "@type": "Painting",
  "name": "The Scream",
  "url": "https://en.wikipedia.org/wiki/The_Scream",
  "creator": {
    "@type": "Person",
    "name": "Edvard Munch",
    "sameAs": "https://en.wikipedia.org/wiki/Edvard_Munch"
  }
}
```



ATTRIBUTION

Student life. African American students (UA023.025.012), Special Collections Research Center at NCSU Libraries

[Contact us about this resource](#)

Item information

Title:

Going Places: Students walking by the Bell Tower

Full Screen

```

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE html> == $@
<html lang="en" class="js flexbox flexboxlegacy canvas canvastext webgl no-touch geolocation postmessage websqldatabase indexeddb hashchange history draganddrop websockets rgba hsla multiplebgs backgroundsize borderimage borderradius boxshadow textshadow opacity cssanimations csscolumns cssgradients cssreflections csstransforms csstransforms3d csstransitions fontface generatedcontent video audio localstorage sessionstorage webworkers applicationcache svg inlinesvg smil svgclippaths no-ipad no-iphone no-ipod no-appleios">
  <head>...</head>
  <body class="blacklight-catalog blacklight-catalog-show home-text asset_type_still-image">
    <header id="top-header">...</header>
    <!-- /container -->
    <div id="main-container" class="container">
      ::before
      <!-- /Top bar -->
      <div class="row">...</div>
      <div class="row">
        ::before
        <main id="content" class="col-xs-12 show-document">...</main>
        <script type="application/ld+json">
          {
            "@context": "http://schema.org",
            "@type": "CreativeWork",
            "@id": "https://d.lib.ncsu.edu/collections/catalog/0227879",
            "url": "https://d.lib.ncsu.edu/collections/catalog/0227879",
            "name": "Going Places: Students walking by the Bell Tower",
            "thumbnailUrl": "https://iiif.lib.ncsu.edu/iiif/0227879/full/350,/0/default.jpg",
            "image": "https://iiif.lib.ncsu.edu/iiif/0227879/full/350,/0/default.jpg",
            "dateCreated": "1970",
            "about": {
              "@type": "Thing",
              "name": "Universities and colleges",
              "@type": "Thing",
              "name": "Students",
              "@type": "Thing",
              "name": "African American students",
              "@type": "Thing",
              "name": "African Americans -- History",
              "@type": "Thing",
              "name": "Student Life",
              "@type": "Thing",
              "name": "People",
              "@type": "Thing",
              "name": "North Carolina State University",
              "description": "Established by the N.C. General Assembly in 1887 as a Land Grant college in Raleigh, NC, the University now has the largest student body of the 17 campuses comprising the University of North Carolina system and is the largest institution of higher learning in the state.",
              "@type": "Organization",
              "name": "North Carolina State University -- Students",
              "@type": "Organization",
              "keywords": [
                "Universities and colleges",
                "Students",
                "African American students",
                "African Americans -- History",
                "Student Life",
                "People"
              ],
              "genre": [
                "Photographs"
              ],
              "inLanguage": [
                "eng"
              ],
              "isPartOf": [
                "https://d.lib.ncsu.edu/collections/catalog?f%5Bispartof_facet%5D%5B%5D=University+Archives+Photographs"
              ],
              "contentLocation": {
                "@type": "Place",
                "name": "North Carolina State University, Memorial Belltower -- Memorial Tower (Raleigh, Wake County, North Carolina)",
                "alternateName": "NCSU Memorial Belltower (Raleigh, N.C.)",
                "description": null,
                "address": {
                  "@type": "PostalAddress",
                  "addressLocality": "2701 Sullivan Drive",
                  "addressRegion": "North Carolina",
                  "postalCode": "27607",
                  "geo": {
                    "@type": "GeoCoordinates",
                    "latitude": "35.786098",
                    "longitude": "-78.663498"
                  },
                  "@type": "Place",
                  "name": "Raleigh (N.C.)",
                  "geo": {
                    "@type": "GeoCoordinates",
                    "latitude": "35.7719",
                    "longitude": "-78.6389"
                  }
                }
              }
            }
          }
        </script>
      <:after
    </div>
    <:after
  </div>
  <:after
  <div id="ajax-modal" class="modal" tabindex="-1" role="dialog" aria-labelledby="modal menu" aria-

```

Image from <https://d.lib.ncsu.edu/collections/catalog/0227879> 28

Now to apply what we've learned

Activity Instructions

See

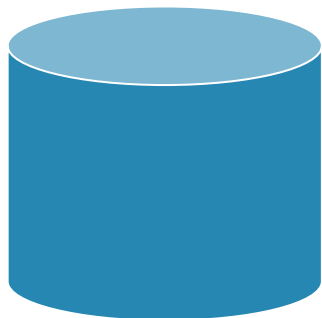
<https://github.com/eightBitter/erl2018-linked-data-workshop/blob/master/schemaOrg-jsonld/activity-instructions.md>

What Now?

Publishing Workflow

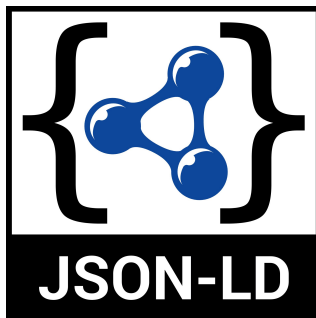
Extract

- Data from source



Transform

- Data into schema.org
+ semantic markup



Load

- Transformed data
into HTML
documents

