



METADATA FOR DIGITAL RECORDS: THE NUTS AND BOLTS

LOUISE SPITERI

SCHOOL OF INFORMATION MANAGEMENT

DALHOUSIE UNIVERSITY

LOUISE.SPITERI@DAL.CA



“Have you ever thought about what life without metadata would be like? Not the traditional database metadata, but retail metadata - the kind of metadata that appears on every product inside Wal-Mart, Kroger and Publix. For example, consider a simple bottle of aspirin, where the metadata on the box includes the manufacturer, ingredients, volume, quantity, directions and safety warnings. Open the box, and there is an insert with even more metadata on how and when to use the product. Not to mention the bottle itself, which repeats much of the metadata that was on the box, only in smaller print.”

Stephens, R. T. (2007, March 1). Life without metadata: Knowledge: The essence of metadata. *DM Review Magazine*. Retrieved from: <http://www.dmreview.com/issues/20070301/1076522-1.html>

DEFINITIONS OF METADATA

NISO. (2004).
Understanding
metadata. Retrieved
from

<http://www.niso.org/publications/press/UnderstandingMetadata.pdf>

Gilliland, A. J. (2008).
Setting the stage. In M.
Baca (Ed), *Introduction
to metadata* (version
3.0). Los Angeles:
Getty Press. Retrieved
from

http://www.getty.edu/research/publications/electronic_publications/intrometadata/setting.html

- Metadata is structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage an information resource.

- A more useful way of thinking about metadata is as the sum total of what one can say about any **information object** at any level of aggregation. In this context, an information object is anything that can be addressed and manipulated as a discrete entity by a human being or an information system. The object may comprise a single item, it may be an aggregate of many items, or it may be the entire database or record-keeping system. Indeed, in any given instance one can expect to find metadata relevant to any information object existing simultaneously at the item, aggregation, and system levels.

The NISO logo is displayed in a red, stylized font.

National
Information
Standards
Organization

MAIN FUNCTIONS OF METADATA (NISO 2004), 1

Metadata helps resource discovery by:

- Allowing resources to be found by relevant criteria;
- Identifying resources;
- Bringing similar resources together;
- Distinguishing dissimilar resources; and
- Giving location information.

The NISO logo consists of the letters "NISO" in a bold, red, serif font.

National
Information
Standards
Organization

MAIN FUNCTIONS OF METADATA (NISO 2004), 2

Organizing electronic resources

- As the number of Web-based resources grows exponentially, aggregate sites or portals are increasingly useful in organizing links to resources based on audience or topic. Such lists can be built as static webpages, with the names and locations of the resources “hardcoded” in the HTML.

Interoperability

- Describing a resource with metadata allows it to be understood by both humans and machines in ways that promote interoperability. Interoperability is the ability of multiple systems with different hardware and software platforms, data structures, and interfaces to exchange data with minimal loss of content and functionality. Using defined metadata schemes, shared transfer protocols, and crosswalks between schemes, resources across the network can be searched more seamlessly.

The NISO logo consists of the letters "NISO" in a bold, red, serif font.

National
Information
Standards
Organization

MAIN FUNCTIONS OF METADATA (NISO 2004), 3

Digital identification

- Most metadata schemes include elements such as standard numbers to uniquely identify the work or object to which the metadata refers. The location of a digital object may also be given using a file name, URL (Uniform Resource Locator), or some more persistent identifier such as a [PURL](#) (Persistent URL) or [DOI](#) (Digital Object Identifier). Persistent identifiers are preferred because object locations often change, making the standard URL (and therefore the metadata record) invalid.

The NISO logo is rendered in a bold, red, serif font.

National
Information
Standards
Organization

MAIN FUNCTIONS OF METADATA (NISO 2004), 4

Archiving and preservation

- Most current metadata efforts focus on the discovery of recently created resources. However, there is a growing concern that digital resources will not survive in usable form into the future... Metadata is important to ensuring that resources will survive and continue to be accessible into the future .

TYPES OF METADATA, 1

Descriptive metadata describes a resource for purposes such as discovery and identification. It can include elements such as title, abstract, author, and keywords.

Structural metadata models the type of content and attributes (i.e., the actual fields)

TYPES OF METADATA, 2

Administrative metadata provides information to help manage a resource, such as when and how it was created, file type and other technical information, and who can access it.

- **Rights management metadata** deals with intellectual property rights.
- **Preservation metadata** contains information needed to archive and preserve a resource.

STRUCTURAL METADATA

Title: Ta-dah!
Description: That's a serious jello mold!
Tags: jello, layers, delicious
Appears in: Dinner (set)
Created by: Dan DeLuca
Taken on: February 14, 2010
Taken with: Fujifilm FinePix F70EXR
Usage Rights: CC-BY Some rights reserved
Source URL:
<http://www.flickr.com/photos/dandeluca/4360567363>



- Models the content types and attributes
- Answers the question “What constitutes a piece of content?”
- Example types: article, product, photo

DESCRIPTIVE METADATA

Title: Ta-dah!
Description: That's a serious jello mold!
Tags: jello, layers, delicious
Appears in: Dinner (set)
Created by: Dan DeLuca
Taken on: February 14, 2010
Taken with: Fujifilm FinePix F70EXR
Usage Rights: CC-BY Some rights reserved
Source URL:
<http://www.flickr.com/photos/dandeluca/4360567363>



- Describes the subject matter of the content
- Answers the question “What is this content about?”
- Examples: Keywords, subjects, title, description and abstract

ADMINISTRATIVE METADATA

12

Title: Ta-dah!

Description: That's a serious jello mold!

Tags: jello, layers, delicious

Appears in: Dinner (set)

Created by: Dan DeLuca

Taken on: February 14, 2010

Taken with: Fujifilm FinePix F70EXR

Usage Rights: CC-BY Some rights reserved

Source URL:

<http://www.flickr.com/photos/dandeluca/4360567363>



- Often machine generated
- Answers questions about the creation & status of the content
- Examples: Author, publish date, status, rights and access

CREATING METADATA

Good metadata:

- should be appropriate to the materials in the collection, users of the collection, and intended, current and likely use of the digital object.
- supports interoperability.
- uses standard controlled vocabularies to reflect the what, where, when and who of the content.
- includes a clear statement on the conditions and terms of use for the digital object.
- should have the qualities of archivability, persistence, unique identification, etc. Good metadata should be authoritative and verifiable.
- supports the long-term management of objects in collections.

Exercise: What metadata elements can we assign these super heroes?



METADATA SCHEMES

Metadata schemes are sets of metadata elements designed for a specific purpose, such as describing a particular type of information resource. Each metadata schema will usually have the following characteristics:

- A limited number of elements
- The name of each element
- The meaning of each element

SOME POPULAR METADATA SCHEMES, 1

Resource Description Formats

- [MARC 21 formats](#) - Representation and communication of descriptive metadata about information items
- [MARCXML](#) - MARC 21 data in an XML structure
- [MODS \(Metadata Object Description Standard\)](#) - XML markup for selected metadata from existing MARC 21 records as well as original resource description
- [MADS \(Metadata Authority Description Standard\)](#) - XML markup for selected authority data from MARC21 records as well as original authority data
- [EAD \(Encoded Archival Description\)](#) - XML markup designed for encoding finding aids
- [VRA Core](#) -- The VRA Core is a data standard and XML schema for the description of works of visual culture as well as the images that document them

SOME POPULAR METADATA SCHEMES, 2

Digital Library Standards

- [METS \(Metadata Encoding & Transmission Standard\)](#) - Structure for encoding descriptive, administrative, and structural metadata
- [MIX \(NISO Metadata for Images in XML\)](#) - XML schema for encoding technical data elements required to manage digital image collections
- [PREMIS \(Preservation Metadata\)](#) - A data dictionary and supporting XML schemas for core preservation metadata needed to support the long-term preservation of digital materials.
- [TextMD \(Technical Metadata for Text\)](#) - XML schema that details technical metadata for text-based digital objects.
- [ISO/DIS 25577](#) - Information and documentation -- MarcXchange.
- [ISO 20775](#) - Schema for Holdings Information.
- [ALTO](#) - Technical Metadata for Optical Character Recognition
- [AudioMD and VideoMD](#) - XML Schemas that detail technical metadata for audio- and video-based digital objects

EXAMPLE OF METADATA SCHEME

DUBLIN CORE





DUBLIN CORE

- The Dublin Core Metadata Element Set traces its origins to a 1995 workshop hosted by OCLC (Online Computer Library Center) in Dublin Ohio, in which more than 50 people discussed how a core set of semantics for Web-based resources would be useful for categorizing the Web for easier search and retrieval. The resulting set of semantics was called "Dublin Core metadata" based on the location of the workshop.
- DC often serves as the basic template for many other metadata schemes, which is why we will focus on it.



GOALS OF DUBLIN CORE, 1

- **Simplicity of creation and maintenance:** The DC element set has been kept as small and simple as possible to allow a non-specialist to create simple descriptive records for information resources easily and inexpensively, while providing for effective retrieval of those resources in the networked environment.
- **Commonly-understood semantics:** Discovery of information across the vast commons of the Internet is hindered by differences in terminology and descriptive practices from one field of knowledge to the next. DC can help the "digital tourist" -- a non-specialist searcher -- find his or her way by supporting a common set of elements, the semantics of which are universally understood and supported



GOALS OF DUBLIN CORE, 2

- **International scope:** The Dublin Core Element Set was originally developed in English, but versions are being created in many other languages, including Finnish, Norwegian, Thai, Japanese, French, Portuguese, German, Greek, Indonesian, and Spanish. The DCMI Localization and Internationalization Special Interest Group is coordinating efforts to link these versions in a distributed registry.
- **Extensibility:** While balancing the needs for simplicity in describing digital resources with the need for precise retrieval, Dublin Core developers have recognized the importance of providing a mechanism for extending the DC element set for additional resource discovery needs. It is expected that other communities of metadata experts will create and administer additional metadata sets, specialized to the needs of their communities. Metadata elements from these sets could be used in conjunction with Dublin Core metadata to meet the need for interoperability.

DUBLIN CORE METADATA ELEMENT SET

Content	Intellectual Property	Instantiation
Title	Creator	Date
Subject	Publisher	Type
Description	Contributor	Format
Source	Rights	Identifier
Language		
Description		
Coverage		



Government of Canada

Gouvernement du Canada

Canada.gc.ca | Services | Departments | Français

Government of Canada



Canada

Search

About Canada

About Government

Resource Centre

Help

Harper Government Announces Safe Food For Canadians Action Plan

Building on its long-standing commitment to food safety, the Harper Government unveiled its Safe Food for Canadians Action Plan today.



1 2 3 || Pause More Government News

Our Governance

- [Governor General](#)
- [Prime Minister](#)
- [Parliament](#)

Canadians

Visitors and Newcomers

Business

Services for Canadians

- [Border Wait Times](#)
- [GST/HST Credit](#)

Priorities

Skills Training



EMBEDDED DUBLIN CORE METADATA RECORD FOR GOVERNMENT OF CANADA'S HOME PAGE

```
<meta name="dcterms.description" content="Access information on Canada, its government, and federal programs and services organized into categories. Find an MP's e-mail address, the latest government news, or other Government of Canada resources by topic, organization or keyword" />
<meta name="description" content="Access information on Canada, its government, and federal programs and services organized into categories. Find an MP's e-mail address, the latest government news, or other Government of Canada resources by topic, organization or keyword" />
<meta name="keywords" content="government of Canada, Canadian government, Canada Web site, federal government Canada, Canada Site, services for Canadians, services for non-Canadians, Canadian government information, government of Canada Web site, services for Canadian business, services for entrepreneurs, commerce, Canada International, Members of Parliament, e-mail MP, e-mail updates, e-mail notification, health warnings, safety and security, border crossings, travel advisories, Mobile Portal, youth, children, Aboriginal peoples, environment, travel, identification, health, businesses, seniors, Old Age Security, Canada Pension Plan, pensions, passport, immigration, Social Insurance Number, replacing personal documents, GST/HST credit, financial benefits, My Government Account, electronic mail, government priorities, jobs, employment" />
<meta name="dcterms.creator" content="Government of Canada, Human Resources and Skills Development Canada, Service Canada" />
<meta name="dcterms.title" content="Home - Government of Canada Web site" />
<meta name="dcterms.issued" title="W3CDTF" content="2011-12-05" />
<meta name="dcterms.modified" title="W3CDTF" content="2013-04-18" />
<meta name="dcterms.subject" title="scheme" content="federal government; federal departments; government publications; federal programs; government services; youth; children; Aboriginal peoples; environment; travel; identification; health; justice system; businesses; older adults; government communications; accountability; taxes; health care; crime; child care; government news; Prime Minister; immigration" />
```

EXAMPLE OF METADATA SCHEME

VISUAL RESOURCES ASSOCIATION
CORE CATEGORIES





VISUAL RESOURCES ASSOCIATION

The Visual Resources Association is a multi-disciplinary community of image management professionals working in educational and cultural heritage environments. The Association is committed to providing leadership in the field, developing and advocating standards, and providing educational tools and opportunities for its members.



VRA CORE

Categories are intended to document:

- Works of visual culture
- The images that document those works

A flexible, open-ended, metadata content standard



GOALS OF VRA CORE

To enable good descriptive cataloguing

To create a place for sharing documentation

To improve access

To aid in further research & education of visual resources

To promote interoperability between image databases



VRA CORE CATEGORIES, 1

- All categories need not be used
- No minimum amount of elements
- Elements are repeatable
- No specific order
- Flexible and customizable
- Compliant with Dublin Core elements where possible



VRA CORE CATEGORIES, 2

- Record Type
- Type
- Title
- Measurements
- Material
- Technique
- Creator
- Date
- Location
- ID Number
- Style/Period
- Culture
- Subject
- Relation
- Description
- Source
- Rights

Example of a
VRA record

<u>Work record [refid 28]</u>	
<u>agent</u>	Théophile Alexandre Steinlen (Swiss artist, 1859-1923)
<u>culturalContext</u>	French
<u>date</u>	1896 (creation)
<u>description</u>	[This poster is offset lithography, but mass-produced and commercially printed.] Steinlen's poster advertises the reopening of a cabaret, the Chat Noir in Montmartre. Here the artist worked with several actors to present avant-garde shadow theater, which investigated the artistic and dramatic effects of silhouettes, starring R. Salis as the popular, improvisational narrator ("bonimenteur") of each shadow performance.
<u>inscription</u>	Main caption: Prochainement la très illustre Compagnie du Chat Noir avec ses Pièces d'Ombres Célèbres, ses Poètes ses Compositeurs Avec Rodolphe Salis. Steinlen logo on bottom left. On right side: Imp. Charles Verneau, 114, Rue Oberkampf, Paris
<u>location</u>	Santa Barbara Museum of Art (Santa Barbara, California, United States) 1991.17 [repository] Montmartre, Paris, Île-de-France, France [creation] [location note] Printer/publisher: Charles Verneau, 114, Rue Oberkampf, Paris
<u>material</u>	ink on paper
<u>measurements</u>	61.6 cm (height) x 39.62 cm (width)
<u>relation</u>	
<u>rights</u>	
<u>source</u>	Core 4 Sample Database (VCat) [source, description] CCO (Cataloging Cultural Objects) Catalog Examples; http://www.vrafoundation.org/ccoweb/cco/examplesindex.html



<u>Image record [refid 130]</u>	
<u>agent</u>	
<u>culturalContext</u>	
<u>date</u>	1998 (creation)
<u>description</u>	
<u>inscription</u>	
<u>location</u>	

Exercise: What elements would we describe for this image?



Seattle Monorail and the Seattle Space Needle

Record Series:	Photographs
Collection:	General Subjects Photograph Collection, 1845-2005
County:	Statewide

Item Number:	AR-28001001-ph002556
Photographer:	Unknown
Title:	Seattle Monorail and the Seattle Space Needle
Subject Date:	1964
Creation Date:	1964
Extent:	1 negative : b&w ; 4.5 x 3.5 in.
Scope And Content:	Photograph of the Seattle Monorail and downtown Seattle, July 6, 1964. In the background is the Seattle Space Needle.
Genre:	Film Negatives
Index Terms:	Seattle Monorail; Cities and towns; Seattle (Wash.); Space Needle (Seattle, Wash.); Monorail railroads
Container:	Box 2
Collection Id:	7005
Notes:	
Access Restrictions:	
People:	



<http://www.digitarchives.wa.gov/Record/View/358C2A6BFA211DF2350B7AC83A78AE43>

The background features a light gray gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance. They are primarily located in the upper and lower right areas of the frame.

EXAMPLES OF DIGITAL ARCHIVE RECORDS

British Library Sounds

Allendale, Northumberland

[Add a note](#) All notes My notes Hide notes



Click to make a note at 0:01.

[Add to playlist](#) [Add to favourites](#)

<http://sounds.bl.uk/Accents-and-dialects/Survey-of-English-dialects/021M-C0908X0041XX-0900V1>

Type	sound	Recordist	Ellis, Stanley (male, SED fieldworker)
Duration	00:02:30	Speakers	Sparks, George (b.1898, male, lead miner and farmer)
Cultures	English	Description	George discusses changes in the nature of farming locally. He explains how numerous former smallholdings under individual ownership have been merged into single farms, and he laments the subsequent loss of traditional practices, particularly the use of middens. Byerhope Farm is south of Allendale Common on the hills above Allenheads.
Shelf mark	C908/41	Texts	Linguistic description of this item
Recording date	1955	Metadata record:	View full metadata for this item
Recording locations	Allendale Town, Northumberland: OS Grid Reference(383500,555500)		
Producers	University of Leeds		

```
<dc:rights>http://sounds.bl.uk/JISC ASR IPR STATUS LIST.xls</dc:rights>
<dc:title>Allendale, Northumberland</dc:title>
<dc:source>C908/41</dc:source>
<dc:description>
  George discusses changes in the nature of farming locally. He explains
  single farms, and he laments the subsequent loss of traditional pract
  hills above Allenheads.
</dc:description>
<dcterms:created>1955</dcterms:created>
<dcterms:spatial>
  Allendale Town, Northumberland: OS Grid Reference (383500,555500)
</dcterms:spatial>
<dc:language>English</dc:language>
<dc:type>sound</dc:type>
```

ART DECO

AND THE DECORATIVE ARTS IN THE 1920S AND 1930S

[Advanced Search](#)



Incantation

Title: A colour plate entitled "Incantation" from *Falbalas & fanfreluches : almanach des modes présentes, passées et futures*.

Creator: Barbier, George, 1882-1932.

Date: 1922

Bibliographic Citation: *Falbalas & fanfreluches : almanach des modes présentes, passées et futures*. Paris, Meynial, 1922.

Notes: Aquarelles by George Barbier.

Physical Description: image.figure (illustration).colour 26 x 17.5 cm

Language: French

Subject: [Clothing and dress -- Periodicals.](#)

Publisher: Rare Books and Special Collections, McGill University

is Part Of Exhibition: Art Deco lives on!

Exhibition Theme: The Beginnings

Call Number: [Colgate IX.a Barbier Colgate Collection, Rare Books and Special Collections](#)

Image Identifier: incantations

[Exhibition view](#) 

<http://digital.library.mcgill.ca/artdeco/fullrecord.php>

QUESTIONS?

[Louise Spiteri](#)

Director

[School of Information Management](#)

