

# **PHASE ONE REPORT**

## **Core Metadata Elements for CSU Electronic Theses and Dissertations, Faculty Papers, and University Historic Photographs Collection (Glass Plate Negatives)**

**By**

**Metadata Best Practices Task Force**

**Nancy Chaffin Hunter**

**Shu Liu**

**Patricia J. Rettig**

**Allison Level**

**Colorado State University Libraries**

**Fort Collins, Colorado**

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# Executive Summary

## Background

The Metadata Best Practices Task Force was formed in June, 2007 to conduct a review of the practice of assigning metadata to the Colorado State University Libraries' digital collections.

## Members

- Nancy Chaffin Hunter
- Shu Liu
- Patty Rettig
- Allison Level

## Goals of the Task Force

- to identify metadata standards and schemes currently in use for digital projects and determine how these integrate for the future
- to recommend the implementation of best practices for metadata for digital projects, including consideration of core vs. specific metadata approaches, approaches that take advantage of existing metadata when available and social networking technology
- to provide ongoing support for compliance with best practices that employ technology and the community of individuals who are involved in projects

## Tasks

The Task Force was charged with specific tasks that were divided into phases to address primary concerns of the strategic plan. Phase One focuses on the following digital initiatives:

- Digital Repository: ETD and Faculty Papers
- Digital Collections: Historic Photographs - Glass Plate Negatives

Tasks were identified as follows:

- research metadata standards and schemes to identify metadata standards and schemes applicable to all digital projects; metadata standards and schemes unique to specific disciplines; and technical metadata requirements for digital objects such as media
- recommend metadata standards and schemes for best practices
- identify technology developments/changes in use that are necessary to support practices
- seek input from Digital Matrix Team, Archives and Special Collections, CONTENTdm group and College Liaisons via presentations and reports available on the staff wiki
- present final report to the following groups for adoption: Digital Repositories Matrix and Library Planning Group
- publish final report in institutional repository

The Task Force met in June and July 2007. We reviewed current metadata standards, focusing on the formats we knew were going to be included—PDF and still images (master image in .tiff, access and thumbnail images in .jpg).

We developed a list of core metadata elements to be included in all digital projects. Each element was assigned an obligation: Mandatory, Mandatory if Applicable, Recommended, or Optional.

The Task Force held two open forums, inviting the members/staff of the Digital Matrix Team, Archives and Special Collections, the CONTENTdm Group, College Liaisons, the Digital Projects Group, and the Copy Cataloging Team. Each forum consisted of a review of the proposed core metadata elements and examples of applying those elements to three different types of digital objects. Comments and discussion by the attendees were noted for our final recommendations. The draft Phase One Report was then distributed to the Digital Repositories Matrix Team and the Task Force met with that Team on August 8, 2007. The Task Force briefly reviewed the examples and the draft report, and noted comments.

The recommended core metadata elements are presented in a Summary Table of Elements in the full report. The report also includes a brief discussion, including examples, of each element.

## **Conclusion**

If these recommendations for core metadata elements are accepted, a data dictionary should be created and labeled CSU Core. The Metadata Best Practices Task Force would volunteer to write the CSU Core data dictionary. As projects are planned, we recommend that the project manager uses CSU Core to develop a project-specific data dictionary.

## **Future Phases**

The Task Force recognizes that several decisions remain for us to make during the time that the CSU Core Metadata Dictionary is being completed, as follows:

- the use of controlled vocabularies
- authority control for proper names, geographic areas, buildings, etc.
- usability studies to gauge the adequacy/usefulness of the core metadata elements
- audiences for each of the metadata elements
- technology that will improve technical metadata in collections made available by the CONTENTdm software
- the processes and policies of amending the CSU Core Metadata Dictionary

The Task Force has developed a wiki page that includes the charge, the standards reviewed, various web links, and the full text of the Phase One report: Path:

[http://lib.colostate.edu/staffwiki/index.php?title=Metadata\\_Best\\_Practices\\_Task\\_Force](http://lib.colostate.edu/staffwiki/index.php?title=Metadata_Best_Practices_Task_Force)

Respectfully submitted August 10, 2007

**Metadata Best Practices Task Force**

**Nancy Chaffin Hunter**

**Shu Liu**

**Patty Rettig**

**Allison Level**

# Report

## Background

Beginning June 21, 2007 the Metadata Best Practices Task Force (Nancy Chaffin Hunter, Shu Liu, and Patty Rettig) began meeting to develop recommendations for core metadata for digital projects, focusing on Electronic Theses and Dissertations, Faculty Papers, and the University Historic Photographs Collection: Glass Plate Negatives. Allison Level expressed an interest in being part of the Task Force and brought both experience with metadata creation and a public services perspective. She was added to the Task Force and met with us beginning with the July 3, 2007 meeting.

The Task Force reviewed current metadata standards: *Dublin Core Metadata Initiative* (DC), *Collaborative Digitization Program Dublin Core Metadata Best Practices* (CDP), *Networked Library of Digital Theses and Dissertations ETD-MS - an Interoperability Metadata Standard for Electronic Theses and Dissertations* (ETD-MS), *Visual Resources Association VRA Core* (VRA Core), *Institute of Electrical and Electronics Engineers Learning Object Metadata Standard* (LOMS), *NISO/ANSI Z39.87: Technical Metadata for Digital Still Images* (Z39.87), and *PREMIS Data Dictionary* (PREMIS). To date, no collection development policy has been finalized for the formats of digital objects to be included in the repository; as a result, the Task Force focused on the formats we knew were going to be included—PDF and still images (master image in .tiff, access and thumbnail images in .jpg).

The Task Force has developed a wiki page on the Staff Wiki under Committees and Groups. Path: [http://lib.colostate.edu/staffwiki/index.php?title=Metadata\\_Best\\_Practices\\_Task\\_Force](http://lib.colostate.edu/staffwiki/index.php?title=Metadata_Best_Practices_Task_Force). Documents, standards, and links to related web and wiki pages are included in the wiki.

As the Task Force reviewed the metadata elements of the above standards, we developed a list of core metadata elements to be included in all digital projects. Each element was assigned an obligation: Mandatory, Mandatory if Applicable, Recommended, or Optional. On July 12, 2007, the Task Force held two open forums, inviting the members/staff of the Digital Matrix Team, Archives and Special Collections, the CONTENTdm Group, College Liaisons, the Digital Projects Group, and the Copy Cataloging Team. Each forum consisted of a review of the proposed core metadata elements and examples of applying those elements to three different types of digital objects: a PDF digital dissertation, a PDF faculty paper from the Atmospheric Science Paper series, and a digitized version of a glass plate negative from the University Historical Photographs Collection. Comments and discussion by the attendees were noted for our final recommendations.

Below is a table summarizing the Task Force's recommendation for core metadata elements, followed by a brief discussion, including examples, of each element. Comments in parentheses in the examples are for clarification only, and would not be part of the metadata.

## Summary Table of Elements

Element Name	Repeatable	Obligation
Identifier	Yes	Mandatory
Title	No	Mandatory
Date.Digital	No	Mandatory
Publisher	Yes	Mandatory
Rights	Yes	Mandatory
Subject/Key term	Yes	Mandatory
Type	Yes	Mandatory (extracted in DigiTool)
Format	No	Mandatory (extracted in DigiTool)
Format.Extent	Yes	Mandatory (extracted in DigiTool)
Additional Technical Metadata	Yes	Mandatory (extracted in DigiTool)
MetadataSchema	Yes	Mandatory
Date.Original	No	Mandatory if Applicable
Creator	Yes	Mandatory if Applicable
Title.Alternative	Yes	Mandatory if Applicable
Language	Yes	Mandatory if Applicable
Thesis.Degree.Name	No	Mandatory if Applicable
Thesis.Degree.Level	No	Mandatory if Applicable
Thesis.Degree.Discipline	No	Mandatory if Applicable
Thesis.Degree.Grantor	No	Mandatory if Applicable
Description.Abstract	Yes	Mandatory if Applicable
Source	Yes	Mandatory if Applicable
Relation.IsFormatOf	Yes	Mandatory if Applicable
Relation.IsPartOf	Yes	Mandatory if Applicable
Relation.HasPart	Yes	Mandatory if Applicable
Relation.IsVersionOf	Yes	Mandatory if Applicable
Relation.IsReplacedBy	No	Mandatory if Applicable
Relation.Replaces	No	Mandatory if Applicable
Relation.IsRequiredBy	Yes	Recommended
Relation.Requires	Yes	Recommended
Coverage.Spatial	Yes	Recommended
Coverage.Temporal	Yes	Recommended
Description	Yes	Recommended
Contributor	Yes	Recommended
Contributor.Role	Yes	Optional
Relation.ConformsTo	Yes	Optional
Relation.HasVersion	Yes	Optional
Relation.References	Yes	Optional
Relation.IsReferencedBy	Yes	Optional
Audience	Yes	Optional
Description.TableOfContents	No	Optional
Relation.HasFormat	Yes	Optional

## Element Discussion

### **Identifier (*Mandatory, Repeatable*)**

The *Identifier* is a character string (alphabetic and/or numeric) that is unique within the repository. The *Identifier* would consist of an alphabetic abbreviation of the project/source of the original object followed by either meaningful numeration from the source or an accession-type number.

Notes: Both CONTENTdm and DigiTool assign each digital object an identifier that is akin to an accession number. There may be other types of identifiers appropriate to specific digital objects, such as an OCLC record number, ISBN, etc. Minimally, there should be an *Identifier* assigned by the metadata creator and an *Identifier* assigned by the content management system. Usually, the identifier will also be the file name of the digital object.

Examples:

- UHPC04775.tif (“UHPC” stands for the collection: University Historic Photograph Collection; “04775” is a five digit number based on the number assigned by OIS to the glass plate negative, with pre-pended zeroes as required to achieve five digits; “.tif” is the extension for the digital master)
- COFETD20070001.pdf (“COFETD”: “COF” stands for Colorado State University [COF is the OCLC holding symbol for CSU] and “ETD” stands for the collection Electronic Theses and Dissertations; “2007” is year of the degree; “0001” is a four digit accession number assigned when the paper is submitted [leading zeroes are used to allow for proper ASCII sorting]; “.pdf” is the extension for the digital master)

### **Title (*Mandatory, Not Repeatable*)**

The *Title* should be taken from the resource itself, transcribed exactly. If there is no title on the resource, the title should be taken from the finding aid created for the collection. If there is no finding aid title, the metadata creator will create a title that describes the resource. Unqualified *Title* is not repeatable. If additional titles are required/desired, use the *Title.Alternative* element.

Example:

- Ultrafast quantum coherent control apparatus (title from thesis title page, transcribed exactly)
- Boys and Girls Club (title from UHPC finding aid)

### **Date.Digital (*Mandatory, Not Repeatable*)**

*Date.Digital* is the date that the digital master was created. In DigiTool, *Date.Digital* is extracted from the digital object during the ingest process. At present, it appears that dates extracted by DigiTool do not conform to the ISO 8601 standard as defined by the World Wide Web Consortium (W3C) at: <http://www.w3.org/TR/NOTE-datetime>, i.e., YYYY-MM-DDThh:mm:ss.sTZD, where YYYY is the four digit year, MM is the two digit month, DD is the two digit day of the month, T notes the beginning of time notation, hh is the two digit hour based on a 24 hour clock, mm is the two digit minute, ss is the two digit second, .s is the single digit 1/10<sup>th</sup> of a second, and TZD is the time zone expressed as relates to Coordinated Universal Time (UTC). The Task Force will confirm that the *Date.Digital* format is nonconforming, and investigate alternatives. If the *Date.Digital* is manually entered, the minimum expression will be YYYY-MM-DD.

Examples:

- 2007-07-03T14:20:30.45+01:00 (exact creation date/time of the digital object—this is the form that the DigiTool ingest process should create)
- 2007-07-03 (entered manually in CONTENTdm)

**Publisher (*Mandatory, Repeatable*)**

The entity who is responsible for making the digital resource available. Colorado State University Libraries (CSUL) will always be entered in this element. Possibly, departments, colleges, research labs, etc. could also appear in a repeated *Publisher* element; especially if the department, etc. delivers the digital object to the Libraries. Optionally, departments, etc. who are the publishers of the original, but do not create the digital object itself, would be entered in the *Contributor* element.

Examples:

- Colorado State University. Libraries
- Colorado State University. Dept. of Atmospheric Sciences

**Rights (*Mandatory, Repeatable*)**

The *Rights* element contains a statement of copyright permission or special conditions for use of the digital object. Historically this has been a hyperlink to the statement relevant to the resource.

Example:

- <http://lib.colostate.edu/gfr/gfrcopyright.html>

**Subject/Key terms (*Mandatory, Repeatable*)**

The *Subject/Key term* element is repeatable and includes subject terms from controlled vocabularies and/or submitter supplied key terms. The use of this element is subject to project-level management decisions. If both controlled terms and uncontrolled key terms are in the metadata record, they should be assigned to separately tagged fields, i.e., controlled terms and uncontrolled terms should not exist in the same metadata field.

Examples:

- Reservoirs – Aeration (Library of Congress Subject Heading)
- Oxidization (submitter-contributed key term)
- Man-made reservoirs (submitter-contributed key term)

**Type (*Mandatory, Repeatable*)**

The *Type* should be taken from the list of Internet Media Types available at <http://www.iana.org/assignments/media-types/>. This element is provided as part of the extracted technical metadata in DigiTool; it must be entered manually in CONTENTdm.

Examples:

- text/rtf
- application/pdf
- image/tiff

**Format (*Mandatory, Not Repeatable*)**

The value for the *Format* element should come from the DCMI Type Vocabulary available at <http://dublincore.org/documents/dcmi-type-vocabulary/>. This element is provided as part of the extracted technical metadata in DigiTool. This element must be entered manually in CONTENTdm.

Examples:

- Text
- Still Image

**Format.Extent (*Mandatory, Repeatable*)**

The *Format.Extent* element contains the size of the digital object in bytes. For audio and moving images, a second *Format.Extent* element contains playing time expressed in minutes and seconds. This element is provided as part of the technical metadata extracted during the ingest process in DigiTool. It can also be extracted during the ingest process in CONTENTdm, but the value is expressed in kilobytes rather than bytes, and must be manually converted to conform to the Z39.87 standard.

Examples:

- 3200879 bytes (size of digital object)
- 1 min. 15 sec. (playing time of an audio file)

**Additional Technical Metadata (*Mandatory in DigiTool; individual elements not specified here*)**

The Task Force reviewed the Z39.87 standard and we recommend relying on JHOVE to extract technical metadata within DigiTool during the ingest process. For CONTENTdm collections, only *Type*, *Format*, and *Format.Extent* are mandatory.

No examples are included in this report.

**MetadataSchema (*Mandatory, Repeatable*)**

The *MetadataSchema* contains the data dictionary used to create the metadata. This should be recorded for quality assurance and to assist in evaluating the metadata in the future. The Task Force considers the recommendations in this report to constitute a metadata standard of “CSU Core”. Project level metadata can exceed CSU Core. In those cases, the project manager should establish a data dictionary and reference the project data dictionary in the *MetadataSchema* element. This metadata element is equivalent to the Description and the Encoding Level in the MARC21 Bibliographic standard.

Examples:

- CSU Core (using the elements as recommended in this report)
- ETD Core (using elements as defined for the CSU ETD collection)

**Date.Original (*Mandatory if Applicable, Not Repeatable*)**

The *Date.Original* element contains the date of an analog original that has been digitized. This element is not required for ‘born digital’ objects. When the date of the original artifact is known, the date in *Date.Original* will conform to the ISO 8601 format as defined by the W3C at:

<http://www.w3.org/TR/NOTE-datetime> to the extent that the date is known. i.e., YYYY-MM-DD, or YYYY-MM or YYYY, where YYYY is the four digit year, MM is the two digit month, DD is the two digit day of the month. When the date of the original artifact is unknown, a value of “undated” (without the quotation marks) may be entered in this element. If the date is approximately known, a circa (ca.) date may be entered.

Examples:

- 1910-07-14 (the date the original analog letter was written)
- 1967-05 (the month the original analog Atmospheric Science Paper was published)

- 1915 (the year the original analog photograph was taken)
- ca. 1920 (an approximation of the year the original analog photograph was taken)
- undated (date of the original analog photograph is unknown)

**Creator (*Mandatory if Applicable, Repeatable*)**

The *Creator* element contains the person or entity primarily responsible for the intellectual or artistic content of the digital object. The *Creator* of objects cannot always be known. For example, for most of the images in the UHPC, the photographer is unknown. When the *Creator* is known, this element is mandatory. If multiple people or entities are equally responsible for the intellectual or artistic content of the resource, the *Creator* element may be repeated. If there are mixed responsibilities, the *Creator* element should be used for the primary responsibility and the *Contributor* element should be used for the secondary responsibility.

Examples:

- Collins, Caspar Wever, 1844-1865 (the artist responsible for the Camp Mitchell drawing)
- Colorado State University. Libraries (the entity responsible for creating the CSU Libraries Policies and Procedures Manual)

**Title.Alternative (*Mandatory if Applicable, Repeatable*)**

The *Title.Alternative* element is used to record any form of the title used as a substitute or alternative to the *Title* element.

Examples:

- Ten Days (formal title is 10 Days)
- Wilson Interview (running title to a publication with the formal title: Interview with President Woodrow Wilson)

**Language (*Mandatory if Applicable, Repeatable*)**

The *Language* element contains the language(s) of the intellectual content of the resource. This implies the language(s) in which a text is written or the spoken language(s) of an audio or video resource. Images do not usually have a language unless there is significant text in a caption or in the image itself. At present this element is limited to human languages; the Task Force has not yet addressed computer languages. The Task Force recommends using the three character codes in ISO 639-2, which is maintained by the Library of Congress. Some of these codes differ from the 3-character language codes used in the MARC21 format; the Task Force acknowledges that repurposing metadata from MARC records may require some translation to ISO 639-2. We will investigate automated solutions. In addition, the codes themselves will need an automated process to convert to conventional full language names in English.

Examples

- eng (ISO 693-2 code for English)
- German (the English-language name of the language)

**Thesis.Degree.Name (*Mandatory if Applicable, Not Repeatable*)**

This element contains the formal name of the degree for ETDs, selected from a drop-down menu in the user-submission template in DigiTool. These terms have been added to the template by Digital Repositories Services.

Example:

- Master of Science

**Thesis.Degree.Level** (*Mandatory if Applicable, Not Repeatable*)

This element contains the level of degree for ETDs, selected from a drop-down menu in the user-submission template in DigiTool. These terms have been added to the template by Digital Repositories Services.

Example:

- Masters

**Thesis.Degree.Discipline** (*Mandatory if Applicable, Not Repeatable*)

This element contains the name of the department or program in which the degree is awarded, selected from a drop-down menu in the user-submission template in DigiTool. These terms have been added to the template by Digital Repositories Services.

Example:

- Dept. of Electrical and Computer Engineering.

**Thesis.Degree.Grantor** (*Mandatory if Applicable, Not Repeatable*)

This element contains the name of the degree granting institution.

Example:

- Colorado State University

**Description.Abstract** (*Mandatory if Applicable, Repeatable*)

This element would include an abstract of the paper when one is available and can be copied into this field. The Task Force does not recommend creating abstracts when none exist.

Example:

- It has been claimed that topic metadata can be used to improve the accuracy of text searches. Here, we test this claim by examining the contribution of metadata to effective searching within Web sites published by a university with a strong commitment to and substantial investment in metadata. The authors use four sets of queries, a total of 463, extracted from the university's official query logs and from the university's site map.

**Source** (*Mandatory if Applicable, Repeatable*)

This element describes physical characteristics of the original from which a digital object is derived. The citation of the original is entered in *Relation.IsFormatOf*.

Example:

- black and white photograph, 3 x 5 inches, tear in upper right hand corner

**Relation** (*Obligation varies upon refinement*)

The *Relation* element contains information necessary to show a relationship with another resource. A relationship may be multidirectional (i.e., a record may reference one or more other related resources). There may also be a one-directional relationship, even though a qualifier may exist to show reciprocity (e.g., the use of *Relation.Requires* does not necessitate the use of *Relation.IsRequiredBy* in another record). The relationship may be one of intellectual content variation (*Relation.IsVersionOf/Relation.HasVersion*), part-to-whole (*Relation.IsPartOf/Relation.HasPart*), citation/reference (*Relation.References/Relation.IsReferencedBy, Relation.ConformsTo*), substitution (*Relation.Replaces/Relation.IsReplacedBy*), format variation

(*Relation.HasFormat/Relation.IsFormatOf*), or dependency (*Relation.Requires/Relation.IsRequiredBy*). The element may consist of textual information about the related resource relevant to the specific refinement; it may also consist of an identifier, such as a URI, for linking directly to the other resource.<sup>1</sup>

**Relation.IsFormatOf** (*Mandatory if Applicable, Repeatable*)

This element contains a citation or other means of locating the original format from which the digital object is derived. The original format is described in the *Source* element.

Example:

- Negative no. 4775
- Elsberry, Russell. On the mechanics and thermodynamics of a low-level wave on the easterlies, Atmospheric Science Paper No. 101. Fort Collins: Colorado State University, Dept. of Atmospheric Sciences, 1966. (a reference to the analog original formatted according to Chicago Manual of Style)

**Relation.IsPartOf** (*Mandatory if Applicable, Repeatable*)

This element contains a citation or other means of locating the physical or logical resource of which the digital object is a part.

- University Historic Photograph Collection, Series I, Subseries E (the source collection for the image from Special Collections and Archives)
- Camp Mitchell ; Mud Springs Station ; Ficklins Station GFR003 (in the metadata record for the image of Camp Mitchell only)

**Relation.HasPart** (*Mandatory if Applicable, Repeatable*)

This element contains a citation or other means of locating a resource that is part of the digital object.

- Camp Mitchell GFR0002 (in the metadata record for the full image of Camp Mitchell ; Mud Springs Station ; Ficklins Station)

**Relation.IsVersionOf** (*Mandatory if Applicable, Repeatable*)

This element contains a citation or other means of locating a resource that is a version, edition, or adaptation of the digital object being described. Changes in version imply substantive changes in content rather than differences in format. Resources referenced in this element existed before the digital object being described.

Example:

- Adaptation of the author's dissertation with the same title, 1978.

**Relation.IsReplacedBy** (*Mandatory if Applicable, Not Repeatable*)

This element contains a citation or other means of locating the referenced resource that supplants, displaces, or supersedes the digital object being described. Resources referenced in this element existed after the digital object being described.

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<sup>1</sup> CDP Dublin Core Metadata Best Practices. Version 2.1.1, Sept. 2006, p. 55. Available at: <http://www.cdpheritage.org/cdp/documents/CDPDCMBP.pdf> viewed July 18, 2007

Example:

- Price, L and P. Kendall. If Your Freezer Stops, Food and Nutrition Series: Food Safety, No. 9.357. Fort Collins: Colorado State University Cooperative Extension, Dec. 2004 (this referenced resource replaces the digital version being described in the metadata record)

**Relation.Replaces (*Mandatory if Applicable, Not Repeatable*)**

This element contains a citation or other means of locating the referenced resource that is supplanted, displaced, or superseded by the digital object being described. Resources referenced in this element existed before the digital object being described.

Example:

- Price, L and P. Kendall. If Your Freezer Stops, Food and Nutrition Series: Food Safety, No. 9.357. Fort Collins: Colorado State University Cooperative Extension, Oct. 1999 (this referenced resource is replaced by the digital version described in the metadata record)

**Relation.IsRequiredBy (*Recommended, Repeatable*)**

This element contains a citation or other means of locating a resource that requires the digital object being described, either physically or logically.

Example:

- Larimer County aerial map, <http://library.colostate.edu/ir/AM042> (the digital object being described is a key to the referenced map in our institutional repository)

**Relation.Requires (*Recommended, Repeatable*)**

This element contains a citation or other means of locating a resource required by the digital object being described to support its functionality, delivery, or coherence of content. This can include software required to access the intellectual or artistic content of the resource being described, but the Task Force recommends that software would be entered in *Relation.Requires* only when the software is unusual.

Example:

- ArcView (to view GIS data)
- Larimer County aerial map key, <http://library.colostate.edu/ir/AM043> (references the digital object that is the key to the digital map being described)

**Coverage.Spatial (*Recommended, Repeatable*)**

This element refers to the location(s) covered by the intellectual content of the resource (i.e., place names, longitude and latitude coordinates, celestial sector, etc.) *not* the place of publication. For artifacts or art objects, *Coverage.Spatial* usually refers to the place where the artifact/object originated. The Task Force has not yet investigated using geographic coordinates in *Coverage.Spatial* but will do so in the future.

Example:

- Rocky Mountains (Library of Congress Subject Heading)
- Fort Collins, (Colo.) (Library of Congress Name Authority File)
- 385322N0770208W (geographic coordinates for the Washington Monument)

**Coverage.Temporal** (*Recommended, Repeatable*)

This element refers to the time period covered by the intellectual content of the resource, *not* the publication date. For artifacts or art objects, *Coverage.Temporal* refers to the date or time period during which the artifact/object was made.

Example:

- Jurassic
- 1939-1945 (for World War II)

**Description** (*Recommended, Repeatable*)

A general description of the intellectual or artistic content of the resource.

Example:

- Mrs. Miller describes leaving and working early in the morning to dig sugar beets. (Germans From Russia audio excerpt)

**Contributor** (*Recommended, Repeatable*)

The person(s) or organization(s) who made significant intellectual contributions to the resource but whose contribution is *secondary* to any person(s) or organization(s) already specified in a *Creator* element.

Examples:

- Peterson, Jacob, 1899-1936 (for the illustrator of a monograph)
- Rocca, Jorge G. (for a thesis committee member)

**Contributor.Role** (*Optional, Repeatable*)

This element contains the role of a specific *Contributor*. As long as the *Contributor.Role* cannot be directly linked to the *Contributor*, the Task Force considers this element optional. Some projects may use a limited number of roles as the label for the *Contributor* element.

Examples:

- **Committee Member:** Rocca, Jorge G. (for an ETD, using the role as the label)

**Relation.ConformsTo** (*Optional, Repeatable*)

A reference to an established standard to which the resource conforms.

Example:

- Encoded Archival Description version 2002 (for an EAD in the repository)
- Chicago Manual of Style, 15<sup>th</sup> ed. (for a bibliography formatted according to the 15<sup>th</sup> edition of the Chicago Manual of Style)

**Relation.HasVersion** (*Optional, Repeatable*)

This element contains a citation or other means of locating the referenced resource which is a version, edition, or adaptation of the digital object being described. Resources referenced in this element existed after the digital object being described.

Example:

- Harner, Jeanne. Sickle cell anemia. 2<sup>nd</sup> ed. New York: Random House, 2005. (a reference to a later edition, using Chicago Manual of Style formatting)

**Relation.References** (*Optional; Repeatable*)

The described resource references, cites, or points to the referenced resource. This could be used for the cited references in a scholarly paper; however, the Task Force has not yet determined a way to implement such an element in a way that is efficient.

Example:

- American Culture Series II (the digital object being described is an index to the referenced series)

**Relation.IsReferencedBy** (*Optional; Repeatable*)

The described resource is referenced, cited, or otherwise pointed to by the referenced resource. This could be used to indicate places where the object being described is cited; however, the Task Force has not yet determined a way to implement such an element in a way that is efficient.

Example:

- Price, L and P. Kendall. If Your Freezer Stops, Food and Nutrition Series: Food Safety, No. 9.357. Fort Collins: Colorado State University Cooperative Extension, Dec. 2004 (the digital object being described was cited in the publication referenced)

**Audience** (*Optional; Repeatable*)

This is primarily for learning objects, tutorials, etc.

Example:

- 4<sup>th</sup> grade (for a math tutorial)

**Description.TableOfContents** (*Optional; Repeatable*)

The Task Force recommends that this element be used only when the table of contents can be copied and pasted into the record. Use of this element should be decided at the project level; for example, the manager of a project that includes a digital moving image with chapter titles, or a single audio file containing six songs, might consider *Description.TableOfContents* a valuable element for resource discovery.

No example is given in this report

**Relation.HasFormat** (*Optional; Repeatable*)

The described resource pre-existed or exists concurrently with the referenced resource, which is the same intellectual or artistic content presented in another format. This element would be included only when the referenced resource resides in the repository.

Example:

- <http://library.colostate.edu/ir/AM042> (references the same aerial map in JPEG2000 as the digital object being described, which is a tif image)

## Conclusion

If these recommendations for core metadata elements are accepted, a data dictionary should be created and labeled “CSU Core”. The Metadata Best Practices Task Force volunteers to write the data dictionary for the core standards. As projects are planned, the Task Force recommends that the project manager uses CSU Core to develop a project-specific data dictionary.

The Task Force began the discussion of the use of controlled vocabularies but considered the topic outside the scope of phase one. However, decisions regarding the use of controlled vocabularies are critical and further investigation, including input from a wider range of the repository constituency, is necessary. The Task Force considers this an important part of phase two, as the data dictionary will include recommendations/guidelines for controlled vocabularies and key terms.

A commitment to the core metadata standards will require a commitment of resources including staff time, training, technology tools, and usability studies. The Task Force has only begun investigating implications of using these core metadata standards. Further phases will necessitate additional staff time, resources, and expertise to successfully complete our charge.

The Task Force would like to provide input during any retention decision process for either CONTENTdm and/or DigiTool. If a decision is made to migrate CONTENTdm collections to DigiTool, the Task Force would be willing to investigate the details of metadata migration. We recommend that usability studies addressing metadata be developed and conducted during the pilot phase of the Institutional Repository.

Other tasks for the future listed in the charge to this Task Force will be addressed, but we would like guidance in setting priorities and negotiating timelines.

[http://lib.colostate.edu/staffwiki/index.php?title=Metadata\\_Best\\_Practices\\_Task\\_Force](http://lib.colostate.edu/staffwiki/index.php?title=Metadata_Best_Practices_Task_Force)

Respectfully submitted August 10, 2007

**Metadata Best Practices Task Force**

**Nancy Chaffin Hunter**

**Shu Liu**

**Patty Rettig**

**Allison Level**

## Appendix

### Metadata Example 1: ETD

**Identifier:** COFETD20070001 (or persistent link provided by DigiTool?)

**Title:** Ultrafast quantum coherent control apparatus

**Creator:** Wilson, Jesse (use authorized form)

**Subject (Keyword):** use user-supplied keywords, e.g. CMA-ES, molecular dynamics

**Subject (LCSH):** cataloger supply LC subject headings

**Subject (Specialized):** recommend a pilot to have subject librarians supplying specialized controlled vocabularies based on disciplines

**Abstract:** In recent years, the availability of ultrafast laser sources has opened up a number of opportunities for exploring molecular dynamics that take place on femtosecond time scales. Coherent control experiments involve creating, manipulating, and measuring these ultrafast phenomena. Such controllable processes include second harmonic generation (SHG), creation of vibrational wavepackets, high-harmonic generation, photodissociation, and more. The foundation to all these experiments is an ultrafast pulse shaper and a high-dimensional search algorithm. Here we present the design and construction of a spectral phase-only pulse shaper, including details on alignment and calibration. We also demonstrate the functionality of the device by producing several pulse profiles that could be potentially useful in coherent control experiments. A covariance matrix analysis evolutionary strategy (CMAES) is also implemented, and demonstrated to optimize SHG in a nonlinear crystal. Finally, recognizing that phase-only shapers cannot produce the full range of temporal shapes available to a given input pulse, we show the design and construction of a pulse shaper which uses only a single linear phase mask to gain control over both spectral phase and amplitude by use of phase gratings.

**Language:** English

**Date:** (Fall?) 2007

**Thesis. Degree. Name:** Master of Science (use consistent form)

**Thesis. Degree. Level:** Master's (use consistent form)

**Thesis. Degree. Discipline:** Electrical and Computer Engineering (use authorized form)

**Thesis. Degree. Grantor:** Colorado State University (use authorized form)

**Contributor. Department Head/Director:** Maciejewsky, Anthony (use authorized form)

**Contributor. Advisor:** Bartels, Randy (use authorized form)

**Contributor. Committee Member:** Rocca, Jorge (use authorized form)

**Contributor. Committee Member:** Levinger, Nancy (use authorized form)

**Type:** image; text (from DCMI type vocabulary)

**Format:** application/pdf (from IMT)

**File Size (i.e. Format/Extent):** 1,939,761 bytes

**Publisher:** Colorado State University Libraries

**Rights:** <http://www.acns.colostate.edu/?page=copyright> (or IR rights statement?)

**Metadata Schema:** CSU Core, ETD-MS

**Metadata Example 2: Faculty Papers – Atmospheric Science Paper series (Bluebooks)**  
(MARC record for print used)

Element	Source	Value
Identifier	ASP-[paper no.]	ASP-101
Title	<b>245 \$a</b>	On the mechanics and thermodynamics of a low-level wave on the easterlies
Date.Original	<b>260 \$c</b> or 008 Date 1	1966
Date.Digital	JHOVE/Digitool	XXX
Type	JHOVE/Digitool	XXX
Format	JHOVE/Digitool	XXX
Format.Extent	JHOVE/Digitool	XXX
Publisher	<b>Manually entered</b>	Colorado State University Libraries
Rights	<b>Manually entered</b>	URL
Other technical metadata	JHOVE/Digitool	XXX (multiple fields)
Creator	<b>100 (all subfields)</b>	Elsberry, Russell L.
Language	<b>008 Lang</b>	eng
Coverage.Spatial	043 and/or <b>650 \$z</b> and/or 651 \$a	Caribbean Sea
Contributor	700 and/or <b>710</b> and/or 711	Colorado State University
Contributor.Role	700 and/or 710 and/or 711 \$e; <b>observation of metadata creator</b>	Publisher of original

Contributor	700 <u>and/or</u> <b>710</b> <u>and/or</u> 711	Colorado State University. Dept. of Atmospheric Science
Contributor.Role	700 <u>and/or</u> 710 <u>and/or</u> 711 \$e; <b>observation of metadata creator</b>	Series publisher of original
Relation.IsFormatOf	<b>245 all subfields,</b> <b>260, all subfields</b>	On the mechanics and thermodynamics of a low-level wave on the easterlies / by Russell Elsberry. Fort Collins, Colo. : Colorado State University, 1966
Relation.IsPartOf	<b>440 \$a;</b> 490 1 \$a; 830 \$a; or observatioon of metadata creator	Atmospheric science paper
Identifier.Original	ISBN, ISSN+citation, 090/050/086/082	QC852.C6 no.101
Subject	<b>6XX</b>	Trade winds – Caribbean Sea
Subject	6XX	Atmospheric waves

### Metadata Example 3: A UHPC image (Glass Plate Negative)



<b>Identifier</b>	UHPC04775.tif
<b>Title</b>	Boys and Girls Club
<b>Date</b>	1926-06-23
<b>Publisher</b>	Colorado State University Libraries
<b>Rights</b>	<a href="http://www.acns.colostate.edu/?page=copyright">http://www.acns.colostate.edu/?page=copyright</a>
<b>Source</b>	Negative no. 4775; glass plate negative; 5x7 in.
<b>Relation.IsPartOf</b>	University Historic Photograph Collection, Series I, Subseries E
<b>Relation.IsReferencedBy</b>	<a href="http://lib.colostate.edu/archives/historic_photos.html">http://lib.colostate.edu/archives/historic_photos.html</a>
<b>Coverage.Spatial</b>	Fort Collins (Colo.)
<b>Subject</b>	Colorado State University – Buildings; Colorado State University. Cooperative Extension Service
<b>Type</b>	image
<b>Digital Format</b>	image/jpeg
<b>File Size</b>	144.663 KB
<b>Digital Master Format</b>	image/tiff
<b>Digital Master File Size</b>	18,080,980 bytes
<b>Digital Master Width</b>	2975 pixels
<b>Digital Master Height</b>	2024 pixels
<b>Digital Master Resolution</b>	444 dpi
<b>Digital Master Color Mode</b>	RGB
<b>Digital Master Color Profile</b>	sRGB IEC61966-2.1
<b>EXIF Color Space</b>	sRGB
<b>Digital Master Bit Depth</b>	8
<b>Scanning Software</b>	Silverfast Ai
<b>Imaging Software</b>	Adobe Photoshop CS Windows
<b>Scanner Model Used</b>	Epson Expression 1640XL flatbed scanner
<b>Computer Model Used</b>	Dell Dimension 8250 desktop
<b>Operating System</b>	Windows XP Professional
<b>Date Digitized</b>	2007-03-26

\*Example data for demonstration purposes only; not entirely accurate!