INLS 720: Metadata Architectures
Spring 2023

Basic information

Date and time: Mondays and Wednesdays, 1:25 p.m. to 2:40 p.m.
Location: Manning 208

Instructor information

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Student hours: Mondays 3 p.m. to 4 p.m.

Introduction

Information professions both old and new—from librarians to data scientists—rely on the aggregation of data from multiple sources. Just as a library catalog will incorporate records initially created by various institutions, a data scientist will merge datasets created by various research projects.

Aggregation of heterogeneous data can be a challenging prospect. For example, if one system describes authors and titles of resources in a coordinated statement ("Hamlet by William Shakespeare") and another separates authors and titles into distinct elements, then one system's records would need to be mapped to the other system's structure before they could be aggregated.

Aggregation proceeds more smoothly when data is *interoperable:* when data created for one system can seamlessly work in another system. Interoperability increases when datasets have similar structure, syntax, content, and semantics. This data "infrastructure" is sometimes referred to as *metadata.* Metadata *standards* specify parameters for what is described, how it is described, and the format and syntax of description.

In this course, we will review basic concepts central to this metadata infrastructure and survey the many types of standards that attempt to harmonize description across systems. In addition to learning about metadata standards in a general way, we will examine the metadata standards employed in a particular domain: museums. We will examine how the goals of this example domain are expressed through its standards. We will also observe how data from this example domain appears in large aggregation projects.

Concurrently, we will put these concepts into practice through a semester-long project. In this project, we will imagine ourselves as part of a consortium of organizations working to create a Diverse Television and Video Finder (DTV Finder) for children's audiovisual materials (similar in scope to the Diverse Book Finder available at diversebookfinder.org). Taking on the role of a contributing organization to the DTV Finder, we will develop a set of local guidelines to implement the DTV Finder's selected metadata standards. We will then use the guidelines that we have developed to create a class dataset. We will then examine this dataset to understand the extent of its interoperability and to assess its quality. Throughout these explorations, we will seek to understand the inevitable role of human judgment in data creation. How does judgment intersect with interoperability, standards, and quality?

Objectives

At the end of this course, you will be able to:

- Identify and define the fundamental components of metadata: entities, attributes, and relationships.
- Trace the effects of modeling decisions—ways of defining and relating entities and their attributes—on the resulting data.
- Describe how different types of metadata standards work together.
- Explain how metadata standards reflect the goals, stakeholders, and histories of the domains in which they arise.
- Adapt general standards for local uses.
- Analyze a dataset to determine how metadata standards have been implemented in practice.
- Critically examine
    - The human experience of data work, including the role of human judgment in data creation.
    - The relationship between human judgment, metadata standards, interoperability, and quality.

Course structure

This is an in-person course, meeting twice a week.

All class materials, including syllabus information, readings, recorded lectures, discussion questions, in-class activities, and project documentation, will be available in Canvas. All materials for each week of the semester will be grouped into a separate Canvas module.

Our time in class will be split between discussion, activities, and work relating to the semester project.

The Semester Calendar (below) provides an overview of each week.

Course requirements

To pass the course, you must:.

- Complete all four components of the semester project.
- Acquire at least six collegiality points and document your required points in a brief report.

Semester project overview

The semester project provides an opportunity to critically examine the relationship between data standards, interoperability, and quality, in the context of local data collection and global aggregation.

This project will adopt the following scenario:

A consortium of organizations—including libraries, schools, community groups, and broadcasters—has decided to sponsor a Diverse Television and Video Finder (DTV Finder) for children's programming, similar to the nonprofit Diverse Book Finder project. Anyone—parents, educators, content providers—will be able to search the database to discover, compare, and differentiate children's programs with diverse characters and associated inclusive themes.

As a key element of this initiative, members of the consortium will contribute data to populate the DTV database. Consortium members' local collections might include materials held by the organization (as with the archive of an animation studio that focuses on children's programming) or materials held elsewhere (as with the virtual collection of a school library, which comprises data about freely available Web videos and programs on paid streaming services), or a combination.

To facilitate this data aggregation, consortium members will describe their local collections using an *application profile* that synthesizes elements from

- The PBCore standard for audiovisual content (pbcore.org).
- The Diverse Book Finder project (diversebookfinder.org).

This common schema will be supplemented with several controlled vocabularies to specify allowed values for particular elements. To enable low-cost, efficient aggregation, data will be collected via a widely available technical infrastructure: a Microsoft Excel spreadsheet template.

The project includes four components:

1. Create implementation guidelines for a consortium member to implement the DTV schema for its local collection.
2. Use these local implementation guidelines to create data for ten children's programs (five of your choosing and five common to everyone).
3. Analyze the aggregated dataset created by the class.
4. Reflect on the above activities to develop a professional position statement regarding data quality.

The first part of the project (creating local guidelines) will be primarily group work; the other three parts of the project are individual.

Participation (collegiality points)

We're all in this together! In a course that emphasizes student interaction, it's important that we all find ways to contribute to our mutual learning and well-being. Accordingly, to pass the class, you must *acquire at least six* collegiality points *throughout the semester.*[1]

Some ways to obtain collegiality points include:

- *Consistently* doing the assigned reading and being prepared for class discussion.
- *Generally* fulfilling the discussion success criteria (listed below).
- Facilitating a small-group discussion: getting the conversation started, keeping the group on task, ensuring that everyone has a chance to speak, synthesizing ideas, and so on.
- Serving as the "devil's advocate" in a small-group discussion by articulating opinions or objections that you do not personally share, but that extend the conversation in interesting ways. (This involves acting as the persistent devil's advocate for an entire class, rather than just making a single remark.)
- Acting as the reporter for a small-group discussion, presenting what the group talked about to the class as a while.
- Writing up thoughts about a reading, lecture, discussion, or other activity as a Canvas discussion post.
- Reflecting on a recent news item or everyday experience that expands upon topics germane to the class as a Canvas discussion post.
- Sharing your knowledge with others: for example, helping to explain a reading, discussion topic, or something else from the course to one of your classmates.
- Soliciting knowledge from others: for example, asking a fellow student (or me) for help when you don't understand something.

Have an idea for some other way to obtain collegiality points? Great! Just let me know what you're thinking, and we'll see if it makes sense. We can continue adding to this list throughout the semester.

[1] The idea for collegiality points is liberally adapted from Max Liboiron via Megan Winget.

Tracking collegiality points

I will not keep track of your collegiality points; you will. At the end of the semester, you will submit a report that lists what you've done. This will not be onerous if you keep track throughout the semester.

In the report, you will document each collegiality point in 2-3 sentences. (A sample description of a collegiality point might be: "On Wednesday, January 25, I helped the people in my discussion group understand the Dublin Core abstract model and the 1:1 principle. I used the example of a digitized file of the Mona Lisa and diagrammed the relationships between different resources.")

Also note that, although I encourage you to perform these activities whenever you can, you only need to tell me about *six* of them. So your report can just tell me your six *favorite* collegiality items (or the *first* six), and not all 45 things that you did. In other words, if you want, you can get this report completed early in the semester and be done with it (as long as you don't have more than two unexcused absences, as explained below).

Attendance

In a class that emphasizes student interaction, being absent affects the learning experience of others. Therefore, attendance is a required component of participation.

Everyone has two unexcused absences for the semester. An unexcused absence is when you are away from class for any reason.

If you have more than two unexcused absences in the semester, you must obtain one extra collegiality point for each unexcused absence. (For instance, if you have four unexcused absences for the semester, you will need eight collegiality points, rather than six.)

If you have a good reason to miss class, you can request an excused absence. You don't need to obtain an extra collegiality point for an excused absence.

Acceptable reasons for excused absences include:

- Ill health (physical or mental).
- Family emergencies (your child is sick, your partner is in the hospital).
- Accidents and unanticipated disasters (your apartment floods, your car is stolen, etc).
- Religious holidays.

To obtain an excused absence, send me an e-mail with your reason for being absent. Do not go into detail about your personal circumstances, just tell me the basic reason (e.g., "I'm not feeling well today" etc.).

As a rule of thumb, if it would seem wrong for me to cancel class for that reason, it's probably not an acceptable excuse. For instance, studying for an exam in another class or attending a work meeting are not likely to be acceptable reasons to miss class.

As with the collegiality points, I won't keep track of your absences; you will. But misrepresenting your unexcused absences would be a violation of the honor code, and honor code violations are quite serious (see the course policies below).

Discussion success criteria

If you consistently achieve the following throughout the semester, you can award yourself one collegiality point.

You contribute actively to discussions by:

- Initiating conversations by asking questions of others.
- Volunteering your thoughts, feelings, impressions, and examples.
- Where appropriate, supporting your opinions and claims with evidence.
- Speaking up when you are confused or uncertain. (For instance, it's absolutely fantastic to begin a conversation by saying that you aren't quite sure how to distinguish between levels of abstraction in the FRBR model.)
- Retaining focus on matters germane to the course.
- Maintaining confidence that your contributions are valuable, no matter your background or level of previous knowledge or expertise.

You listen carefully and respond thoughtfully by:

- Maintaining respect and compassion for your classmates.
- Demonstrating that you value others' contributions. (For instance, use verbal and nonverbal cues to show that you're paying attention to your classmates. When someone makes a good point, say so.)
- Attempting to understand unfamiliar perspectives rather than dismissing them (for instance, by asking questions or requesting explanations).
- Disagreeing constructively (for instance, by volunteering a counter-example to consider or referring everyone to the text of a reading).
- Attending to the flow of a conversation (for instance, by changing the topic if interest is flagging, or *not* changing the topic if everyone is enthusiastic about it).

You monitor group dynamics, and adopt the Step Up/Step Back principle:

- *Step back* if you've been talking more than your share.
- *Step up* if you haven't been contributing as much.

Grading and assessment

All graduate students who satisfy the course requirements will receive a P.

You will receive written comments on all assigned work. Feedback will be based on the success criteria and deliverables for each assignment (available in the Assignments area of Canvas).

Due dates

Participation requirements	*Due date*
Collegiality points report	**Wednesday, April 26**

Semester project	*Due date*
Project 1: Local guidelines	**Monday, February 27**
Project 2: Data creation	**Monday, March 20**
Project 3: Data analysis	**Wednesday, April 12**
Project 4: Position paper	**Friday, May 5 at 4 p.m. (per UNC policy, this is the date and time of the scheduled final exam)**

All assignments should be submitted as a PDF document in the Assignments area of Canvas.

Late work

Late work is accepted without penalty.

If you cannot make a deadline, send an e-mail to inform me when you plan to submit your completed assignment. I appreciate being informed about your intention to submit late work as soon as possible, and ideally well before the scheduled due date. In your e-mail, you just need to tell me when you intend to submit your work. You don't need to explain your circumstances; you don't need to apologize; and you don't need to ask me if a certain date is okay with me. Just tell me when you intend to submit your work. (Please do, however, take the project dependencies below into account as you make your plans, and prioritize those assignments that will affect the subsequent work of your colleagues.)

If you don't send me an e-mail and don't turn in a project, I will contact you and ask you to provide your status. (It will help me out tremendously if you tell me your plans yourself, rather than waiting for me to contact you.)

The later that projects are submitted, the less time I will have to provide feedback on them, so keep this in mind. **You'll get fewer comments—or potentially no comments—when you turn things in late.** This will be especially true at the end of the semester. Additionally, because UNC has strict deadlines for final grade submission, late final projects may necessitate that you receive an IN (Incomplete) grade.

Project dependencies

Project 2 cannot begin without the submission of local guidelines from Project 1, and Project 3 cannot begin without the submission of data from Project 2. **In other words, it will affect your classmates if you do not submit the Project 1 local guidelines or the Project 2 data on time. That's quite serious! You will mess up everyone else's schedule if you are late with these components. Please do your best to plan accordingly.** (In contrast, if the reflection essays that are also part of these projects are late, no one else is affected.)

Semester calendar

This calendar may change slightly as the semester proceeds.

Optional readings are just that: extra stuff that is available if you find a topic particularly interesting. (There are no extra bonus points for reading optional materials, because...there are no points!)

All course materials will be available through weekly modules in Canvas.

Date	Topics	Readings	Assignments
Monday, January 9	Introduction to the class Metadata?	• Class syllabus	
Wednesday, January 11	No class (Melanie at CHI program committee meeting) Contribute to discussion forum in Canvas	• Mayernik, 2020 • Gilliland, 2016 • Project 1 instructions • Zeng, 2016 (optional) • Riley, 2017 (optional) • Greenberg, 2009 (optional) • Furner, 2020 (optional)	
Monday, January 16	No class (Martin Luther King, Jr. Day holiday)		

Date	Topics	Readings	Assignments
Wednesday, January 18	Entities and identifiers	• Kent, 1978 • IFLA, 1998 • Coyle, 2006 • Thompson, 2010 • Bates, 1986 (optional) • de Fremery and Buckland, 2021 (optional)	
Monday, January 23	Properties and values	• ANSI/NISO Z39.85 (Dublin Core metadata standard) • CDP Metadata Working Group, 2006 • Heery and Patel, 2000 • Global Terrorism Database (GTD) codebook (optional) • Armed Conflict Location and Event Data Project (ACLED) codebook (optional)	
Wednesday, January 25	Relationships between entities - models	• Dublin Core abstract model • Urban, 2014 • Johnston, 2006 (optional)	
Monday, January 30	Relationships between entities - models	• IFLA, 1998 (again) • Jett, Sacchi, Lee, and Clarke, 2015 • Renear and Dubin, 2008 (optional) • Furner, 2012 (optional) • Lee, et al, 2020 and 2015 (optional)	Submit the 5 programs you will describe for Project 2
Wednesday, February 1	Project group meetings		
Monday, February 6	Standards and interoperability	• Zeng and Chan, 2009 • Elings and Weibel, 2007 • Zeng, 2020 (optional)	
Wednesday, February 8	Project group meetings		
Monday, Februrary 13	No class (university wellness day)		
Wednesday, Februrary 15	The work of creating standards	• Millerand and Bowker, 2009	
Monday, February 20	An encoding standard (linked data)	• Carlson, Lempert, Melvin, and Washington, 2020 • Cultural heritage linked data case studies	
Wednesday, February 22	Project group meetings		
Monday, February 27	An encoding standard (linked data)	• Duval, et al, 2002 • Miller, 1998 • World Wide Web Consortium, 2014 (optional)	Project 1 (implementation guidelines) due

Date	Topics	Readings	Assignments
Wednesday, March 1	Implementation of standards in practice – temporal and cultural factors	• Montoya and Morrison, 2019 *Pick one of the following:* • Ribes, 2017 *Or* • Long, Thompson, Potvin, and Rivero, 2017 • Tennis, 2012 (optional) • Bowker, 2000 (optional) • Buckland, 2012 (optional)	
Monday, March 6	Implementation of standards in practice – quality and assessment	• Waigley, Gelches, and Park, 2010 • Lee, Clarke, and Perti, 2015	
Wednesday, March 8	Implementation of standards in practice – quality and assessment	• Wilkinson, et al, 2016 • Jackson and Barbrow, 2015	
Monday, March 13	No class (spring break)		
Wednesday, March 15	No class (spring break)		
Monday, March 20	Implementation of standards in practice (human labor of data work)	• Plantin, 2021 • Suchman, 1994	Project 2 (data collection) due
Wednesday, March 22	Data analysis exercise #1		
Monday, March 27	Implementation of standards in practice (human labor of data work	• Thomer, et al 2022	
Wednesday, March 29	Data analysis exercise #2		
Monday, April 3	Museum informatics: foundations	• Marty, Raymond, and Twidale 2003 • Bearman, 2008 • Navarrete and Mackenzie Owen, 2016 (optional)	
Wednesday, April 5	Data analysis exercise #3		
Monday, April 10	Museum informatics: standards	Excerpts from: ○ Cataloging Cultural Objects (CCO).	
Wednesday, April 12	Museum informatics: standards	Excerpts from: ○ Categories for Description of Works of Art (CDWA). ○ Art and Architecture Thesaurus (AAT) • Coburn et al, 2010 (optional)	Project 3 (data analysis) due
Monday, April 17	Museum informatics: models	• Gill, 2004 • Doerr, 2004 • Isaac, 2013	

Date	Topics	Readings	Assignments
Wednesday, April 19	Museum informatics: integrative infrastructures	*Cultural heritage data case studies* ○ Europeana ○ ArtStor ○ Digital Public Library of American (DPLA) • Europeana strategy 2020-2025 • ArtStor metadata policy Capurro and Plets, 2021 (optional)	
Monday, April 24	Data work in museum contexts: human judgments and machine judgments	• Villaespesa and Crider, 2020 • Kahn, 2021 (optional) • Waller and Waller, 2017 (optional)	
Wednesday, April 26	Data work in museum contexts: human judgments and machine judgments	• Pawlowicz and Downum, 2021	Project 4 due Friday, May 5, at 4:00 p.m.

Course policies

COVID-19 community standards

As specified by current UNC community standards, everyone at UNC is encouraged to be fully vaccinated and to receive any eligible boosters.

Mask use is encouraged but optional in university buildings.

Please do not come to class if you are sick. Although this class will not offer a remote option, class materials will be posted to Canvas so that you will have access to them, even if you are ill.

For additional information about UNC's current COVID protocols see https://carolinatogether.unc.edu/

Respectful class environment

Learning requires an atmosphere of respect, care, and empathy for each other. This does not mean that we can't disagree; understanding the nature of our disagreements can help us all grow. But disrespect for any person or their identity will not be tolerated.

Asking for help

Should you encounter barriers to your learning—whether it's something that I'm doing or not doing, or challenges in your personal circumstances—I am here to help. Please set up an appointment so that we can work together towards your success.

Know that it is common and natural to feel overwhelmed. Asking for help is not a sign of weakness or failure.

No busy work

No one wants to do boring things for no reason, including me! From my perspective, everything that we do in this class has a purpose that requires thinking. If anything seems like busy work, I probably haven't articulated the purpose well. Be sure to ask for help, so that I can better explain what the task is supposed to achieve.

Instructor communication

For specific, concrete questions, e-mail is the most reliable means of contact for me. If you do not receive a response after a few days, please follow up. It is always helpful if your e-mail includes a targeted subject line that begins with "INLS 720."

For more complicated questions or help, come to student hours (no appointment necessary) or make an appointment to talk with me at a different time.

You are welcome to call me by my first name ("Melanie"). However, you may also use "Dr. Feinberg" or "Professor Feinberg" if that is more comfortable for you.

Student hours

During student hours, I am available to talk with students about anything, without an appointment.

You can use student hours to ask questions, seek help, consult about project work, obtain more information about course topics, or just say hello. You're not bothering me if you attend student hours! I've dedicated this time to talk with students.

During student hours, my office door will be open; simply come in! If I'm talking with someone else, make sure that I know you're there.

Inclusive learning and accessibility

I want everyone to do well in this class. If there are aspects of this course that prevent you from learning or exclude you, please let me know. We'll work together on strategies to meet your needs and satisfy the requirements of the course.

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities.

Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Web site (ars.unc.edu) for details.

Mental health resources

All students have access to counseling and other resources through Counseling and Psychological Services (CAPS). CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to caps.unc.edu or visit their facilities on the third floor of the Campus Health Services building.

Basic needs

If you are navigating financial, health, or housing challenges that may have an impact on your ability to thrive at UNC, one resource is the Dean of Students, which also oversees the Dean's Emergency Fund: https://dos.unc.edu/student-support/student-emergency-and-hardship-funds/

If you are struggling with food insecurity, SILS has a food pantry in the student lounge on the second floor of Manning Hall; feel free to take what you need. You can get assisstance through Carolina Cupboard, an on-campus food pantry: http://carolinacupboard.web.unc.edu/

Academic integrity

The UNC Honor Code states that:

It shall be the responsibility of every student enrolled at the University of North Carolina to support the principles of academic integrity and to refrain from all forms of academic dishonesty...

This includes prohibitions against the following:

- Plagiarism.
- Falsification, fabrication, or misrepresentation of data or citations.
- Unauthorized assistance or collaboration.
- Cheating.

All scholarship builds on previous work, and all scholarship is a form of collaboration, even when working independently. Incorporating the work of others, and collaborating with colleagues, is welcomed in academic work. However, the honor code clarifies that you must always acknowledge when you make use of the ideas, words, or assistance of others in your work. This is typically accomplished through practices of reference, quotation, and citation.

If you are not certain what constitutes proper procedures for acknowledging the work of others, please ask the instructor for assistance. It is your responsibility to ensure that the honor code is appropriately followed. (The UNC Office of Student Conduct provides a variety of honor code resources.)

The UNC Libraries has online tutorials on citation practices and plagiarism that you might find helpful.

Honor code violations can result in serious penalties, such as failing the course.

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Resources and references

These are not assigned, but you may find them helpful.

Metadata fundamentals

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Metadata standards

List of (primarily structural) standards from Metadata book Web site by Zeng and Qin:
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Linked data, Semantic Web, RDF

Linked Data Tools. Semantic Web Primer. Available at: http://www.linkeddatatools.com/semantic-web-basics

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