

**INF 384M TOPICS IN DESCRIPTION AND METADATA:
THEORIES & APPLICATIONS OF METADATA**

Spring 2022

School of Information

University of Texas at Austin

Instructor: Dr. Amelia Acker

Course Information

Class day and time: Wednesdays, 12:00 pm – 3:00 pm

Class location UTA 1.212

Unique Number: 28180

Instructor Information

Instructor: Dr. Amelia Acker

Email: aacker@ischool.utexas.edu (please avoid Canvas messaging)

Telephone: 512-471-8487

Office hours: By appointment (email me 3 times you would prefer to meet)

Office location: 5.434

Teaching Assistant Information

TBD: No TA has been assigned for this course at this time.

Course Description

Introduction to the theoretical foundations, history, principles, and research surrounding the representation of information, digital collections, and data with metadata, with emphasis on concepts of standardization, infrastructure, formats, and exchange. Major topics will include metadata types, value and content standards, formats, data interchange standards and protocols. The course introduces participants to the examination and analysis surrounding issues of effectiveness, economics, values and audience surrounding different types of metadata applications. Provides background for further studies in information organization, preservation, and database management.

Course Rationale

This course examines the nexus between people, information, and technologies in systems that use metadata to provide access to information, data, and collections. Representing information in systems and providing access to it with infrastructure are core functions of the information professions. Many information professionals carry out their work with metadata standards, systems, applications, and techniques that incorporate descriptive and content standards, data structures, controlled vocabularies, and database systems, amongst other kinds of networked database technologies. As contexts for data collection and analytics increase, information professionals such as digital archivists, data librarians, and digital asset managers are increasingly involved in standards development and implementation. The ways in which metadata is created to describe, present, and use information influence the ways that users access evidence and create traces in information infrastructures—ranging from finding books and historical manuscripts in libraries, to writing tweets and emoji on social media platforms, to sending and receiving text messages with mobile devices, to purchasing things from Amazon with 1-click ordering. In fundamental ways, metadata schemas shape how publics create and access the cultural record, form cultural memory, build identities and relationships to the past.

The course is designed to teach fundamental concepts and theories of metadata applications in ways that will be relevant to professional practice in information, library, archival, and cultural heritage institutions. The course will focus upon metadata concepts of enduring value that can be used in the analysis, use, and administration of information services that provide access to information in structured collections. Given the broadness of the topic, the course will be structured around a handful of themes connected to contemporary debates and information artifacts. While neither historically nor thematically exhaustive, these themes capture significant horizons in the future of metadata applications, both in terms of technical innovation and social change in society as we move from an information age to a data society. We will be especially concerned with how information professionals and information institutions figure into these themes, and how our roles may change as the metadata applications and structures expand. While it is usual to cast a distinction between technical and social dimensions when discussing technology, in this course we consider technological innovation as a complex process involving not only technical objects, but also people, ideas, organization, social coordination, markets, politics, and culture.

By the end of the course, participants will be familiar with contemporary descriptive standards, format registries, data interchange, and access tools as related to what data scholars identify as the “data lifecycle” or the “metadata continuum”. Students will also be introduced to a variety of web based, social and interactive metadata applications that are currently employed by archives, libraries, and museums to provide access to analog and digital collections, including bibliographic networked systems and social media APIs. The course will combine foundational themes from archival theory, concepts from the philosophy and history of information, debates from critical data studies and infrastructure studies, with practical applications of metadata standards, including interactive practicums and group work. There will be emphasis on emerging practices of data management, standardization, network infrastructures, and new contexts of metadata collection for re-use. Students will gain an overview of a wide range of metadata topics related to information services, and will be introduced to concepts that will be developed in more depth in other courses throughout the curriculum. The course provides participants background for further studies in reference, metadata transformation, linked open data, information organization and retrieval, database management, issues in digitization and digital preservation.

Course objectives and learning outcomes

The approach of this course is to expose participants to a range of metadata applications that currently shape and have a history of shaping our everyday lives as part of retrieving and accessing information. Students will expand their knowledge base about critical data studies, the history of representation, cataloging and classification, standards and formats. Course participants will learn historical facts about infrastructure and standards development in a variety of metadata applications that allow participants to understand how technological innovation is a complex process involving people, ideas, social coordination, markets, and culture. Upon completion of this course, students will have demonstrated their understanding of, and familiarity with the theories and applications of metadata throughout the data lifecycle, including the processes of creation, description, classification, standardization, processing, annotation, duration, storage—and the opportunities and challenges for information professionals at each stage.

By the end of the course, participants will be able to:

- Describe principles, types, and applications of metadata

- Apply selected metadata standards to the creation of metadata descriptions according to local needs
 - Learn how to plan and execute a metadata project, including how to select appropriate metadata standards to support a defined purpose and audience
 - Develop guidelines, documentation, and policy for metadata workflows and processes
 - Familiarity with quality control, crosswalks and transformation
 - Introduction to a wide array of current structural, content, encoding standards, and an understanding for how standards evolve within communities
 - Tools and techniques for metadata creation and manipulation
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Method of instruction

Each week the instructor will give a lecture and lead classroom discussion, supported by PowerPoint slides, handouts, and online demonstrations. We shall discuss a selected set of readings, all of which are required. It is important that everyone comes to class well prepared and having read the material ready to discuss the week's readings. After discussing the readings, we will have in-class labs, tool tutorials, or small workshops. Following these practicums, we will have a group discussion after the presentations to discuss the use, need, and future possibilities of these tools, systems, and practices. Course participants are expected to be actively involved in these group discussions, labs and practicums. A portion of your grade will be based on your preparation for and participation in the class discussions and practicums. We will adopt a studio approach to the labs and projects and incorporate a variety of peer learning techniques throughout the course.

Course Readings and Materials:

- All course readings are available on the course Canvas site.
- Please make sure to complete all readings before coming to class each week.
- You will need to do additional readings and outside labs to complete your final project.
- Bring a machine that can connect to the internet each week.

Teaching Modality Information

This is an in-person course and class meetings will be held in-person throughout the semester.

Statement on Learning Success

Your success in this class is important to me. We will all need to be adaptable because we all learn differently. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. Together we'll develop strategies to meet both your needs and the requirements of the course. I also encourage you to reach out to the student resources available through UT. Many are listed on this syllabus, but I am happy to connect you with a person or Center if you would like.

Statement on Flexibility

In acknowledgement of COVID 19 and its impact on the University of Texas at Austin community, this course will reaffirm one of the core values here at UT Austin: responsibility. Our responsibility to ourselves and each other is to put our humanity in the forefront of our academic pursuits.

COURSE POLICIES

Instructor Communication: E-mail is the official mode of communication for the university and the most reliable means of contact for me. It is always helpful if your e-mail includes a targeted subject line that begins with “INF 384M.” Do not use the messaging facilities in Canvas; these messages do not arrive in my e-mail in-box. Please allow a 24-hour window for email responses and plan accordingly. Please limit emails to 5 sentences or less. If your query about a reading or an assignment for the class takes more than 5 sentences to express, please come see me face to face in office hours. If you do not receive a sufficient answer to a question in more than one follow-up email (that is, a total of 2 personal emails from me) about the same question, please come meet with me. If you cannot make office hours, please email me to arrange an appointment. These policies are based on my belief in the sanctity and value of high-bandwidth communication (that is, face to face conversations, video conferencing, or voice calls).

Classroom Etiquette: Please come on time to class prepared, bringing soft or hard copies of readings for reference; bring appropriate tools for writing and note taking. Bring personal machines powered up, or plug them in before class begins, silence phones. *Drinks are welcome but food is not. Please eat before class or during the break period.*

Habits of mind: Respect for others; imagination; wonder; willingness to try and fail in front of others; empathy for others—in the past, present and future. I will discuss what I mean by habits of mind on the first day and throughout the course.

Copyright Notice: These materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials.

Statement on Classroom Recording: To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student’s own private use.

On original work: cheating and plagiarism will not be tolerated. If an assignment turned in for credit is found to have been plagiarized, you will receive a grade of 0 points and a formal reprimand in your student file. You will be subject to the University’s disciplinary penalties, including the possibility of failure in the course.

Late assignments: No late assignments will be accepted. However, this semester each student will have an “End of the week” grace period for two (2) assignments to be used at your discretion. “End of the week” is defined as Saturday at 9pm, so as long as you submit the assignment before that time, you will have used one of your two allotted “end of the week” grace periods and no points will be taken for lateness. *(For example: The assignment is due Wednesday at noon. If you turn it in that Wednesday at 1:00pm, you will have used one of your “end of the week” grace periods. Similarly, if you turn it in on Friday at 3:00pm you will have used one of these grace periods.)*

Students who anticipate difficulties with completing assignments on time should consult with the instructor as soon as possible so that alternate solutions can be discussed. When negotiated in advance, arrangements can be made. All assignment due dates are provided to you on the first day of term in the syllabus and via the Canvas website.

Attendance: Attendance is not taken. You do not need to inform me of absences, nor do you need to “make up” anything if you are absent. While participation is an important part of your grade, and attendance is important, there are no specific requirements for mandatory attendance. However, please be aware that a substantial in-class component of the course will be hands-on labs that are successive and cumulatively build skills. Missing a class may impact your ability to follow along in the next week’s lab component.

Style manual: Please use the American Psychological Association’s [style manual](#). In particular, please be sure to follow its citation formats and rules on language bias.

UNIVERSITY POLICIES

Academic Integrity Expectations

Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information, please visit the Student Conduct and Academic Integrity website at: <http://deanofstudents.utexas.edu/conduct>.

Plagiarism is taken very seriously at UT and is subject to academic disciplinary action, including failure of the course.

Confidentiality of Class Recordings

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.

Sharing of Course Materials is Prohibited

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class without explicit, written permission of the instructor. Unauthorized sharing of materials promotes cheating. The University is well aware of the sites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure of the course.

Names and Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. I will gladly honor your request to address you by your chosen name and by the gender pronouns you use. Please advise me of any changes early in the semester so that I may make appropriate updates to my records. Class rosters are provided to the instructor with the student’s chosen (not legal) name, if you have provided one. If you wish to provide or update a chosen name, that can be done easily at this page, and you can add your pronouns to Canvas.

Land Acknowledgment

I would like to acknowledge that we are meeting on the Indigenous lands of Turtle Island, the ancestral name for what now is called North America. Moreover, I would like to acknowledge the Alabama-Coushatta, Caddo, Carrizo/Comecrudo, Coahuiltecan, Comanche, Kickapoo, Lipan Apache, Tonkawa and Ysleta Del Sur Pueblo, and all the American Indian and Indigenous Peoples and communities who have been or have become a part of these lands and territories in Texas.

Religious holy days: A student who misses classes or other required activities, including examinations, for the observance of a religious holy day should inform the instructor as far in advance of the absence as possible, so that arrangements can be made to complete an assignment within a reasonable time after the absence.

Use of E-mail for Official Correspondence: All students should become familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. It is recommended that e-mail be checked daily, but at a minimum, twice per week. The complete text of this policy and instructions for updating your e-mail address are available at <http://www.utexas.edu/its/help/utmail/1564>

Documented Disability Statement: You will need to provide documentation to the Dean of Student's Office so the most appropriate accommodations can be determined. Specialized services are available on campus through Services for Students with Disabilities (SSB 4.104, 471-6259). Any student who requires special accommodations must obtain a letter that documents the disability from the Services for Students with Disabilities area of the Division of Diversity and Community Engagement (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). Present the letter to the professor at the beginning of the semester so that needed accommodations can be discussed. The student should remind the professor of any testing accommodations no later than five business days before an exam. *If you plan to make use of specialized services through SSD please inform me before the second class meeting.* For more information, visit <http://www.utexas.edu/diversity/ddce/ssd/>

Behavior Concerns Advice Line (BCAL): If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit <http://www.utexas.edu/safety/bcal>.

Emergency Evacuation Policy: Occupants of buildings on the UT Austin campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation:

- Familiarize yourself with all exit doors of the classroom and the building. Remember that the nearest exit door may not be the one you used when you entered the building.
- If you require assistance to evacuate, inform me in writing during the first week of class.
- In the event of an evacuation, follow my instructions or those of class instructors. Do not re-enter a building unless you are given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.

Policy on Scholastic Dishonesty: Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, please visit the Student Judicial Services web site at <http://deanofstudents.utexas.edu/sjs/>

University of Texas Core Values and Honor Code: The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community. As a student of the University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity.

UNIVERSITY RESOURCES FOR STUDENTS

The university has numerous resources for students to provide assistance and support for your learning, use these to help you succeed in your classes.

If you experience any hardships such as illness, accident, family crisis please know that these policies may be amended and therefore you should communicate with me as soon as you feel comfortable doing so. If for any reason you do not feel comfortable discussing with me, please visit [Student Emergency Services](#). For additional campus resources, please visit protect.utexas.edu.

The University Writing Center

The University Writing Center offers free, individualized, expert help with writing for any UT student, by appointment or on a drop-in basis. Consultants help students develop strategies to improve their writing. The assistance we provide is intended to foster students' resourcefulness and self-reliance. [http://uwc.utexas.edu/](http://uwc.utexas.edu)

Counseling and Mental Health Center

The Counseling and Mental Health Center (CMHC) provides counseling, psychiatric, consultation, and prevention services that facilitate students' academic and life goals and enhance their personal growth and well-being. <http://cmhc.utexas.edu/>

You may also contact Bryce Moffett, LCSW (iSchool CARE counselor) at 512-232-2983. Outside CMHC business hours (8a.m.-5p.m., Monday-Friday), contact the CMHC 24/7 Crisis Line at 512-471-2255.

Basic Needs Security: Any student who faces challenges of affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believe this may affect their performance in the course, is encouraged to contact the Office of the Dean of Students – Student Emergency Services (SES) for support. Please notify the instructor if you are comfortable doing so and I will make efforts to provide any resources that I may possess to help you navigate issues of food insecurity or residential displacement.

- SES Concerns and Emergencies: <http://deanofstudents.utexas.edu/emergency/concernsemergencies.php>
- SES Food Pantry: <http://deanofstudents.utexas.edu/emergency/pantry.php>

- SES Confidential Advocacy and Support:
<http://deanofstudents.utexas.edu/emergency/advocacysupport.php>

ITS

Need help with technology? <http://www.utexas.edu/its/>

Libraries

Need help searching for information? <http://www.lib.utexas.edu/>

Canvas

Canvas help is available 24/7 at <https://utexas.instructure.com/courses/633028/pages/student-tutorials>

Important Safety Information

If you have concerns about the safety or behavior of fellow students, TAs or professors, contact BCCAL (the Behavior Concerns and COVID-19 Advice Line) at <https://safety.utexas.edu/behavior-concerns-advice-line> or by calling 512-232- 5050. Confidentiality will be maintained as much as possible, however the university may be required to release some information to appropriate parties.

Classroom safety and Covid-19

To help preserve our in-person learning environment, the university recommends the following.

- Adhere to university mask guidance. Masks are strongly recommended, but optional, inside university buildings for vaccinated and unvaccinated individuals, except when alone in a private office or single-occupant cubicle.
- Vaccinations are widely available, free and not billed to health insurance. The vaccine will help protect against the transmission of the virus to others and reduce serious symptoms in those who are vaccinated.
- Proactive Community Testing remains an important part of the university's efforts to protect our community. Tests are fast and free.
- We encourage the use of the Protect Texas App each day prior to coming to campus.
- If you develop COVID-19 symptoms or feel sick, stay home and contact the University Health Services' Nurse Advice Line at 512-475-6877. If you need to be absent from class, contact Student Emergency Services and they will notify your professors. In addition, to help understand what to do if you have been had close contact with someone who tested positive for COVID-19, see this University Health Services link.
- Behavior Concerns and COVID-19 Advice Line (BCCAL) remains available as the primary tool to address questions or concerns from the university community about COVID-19.
- Students who test positive should contact BCCAL or self-report (if tested off campus) to University Health Services.
- Visit Protect Texas Together for more information.

Carrying of Handguns on Campus

Texas' Open Carry law expressly prohibits a licensed to carry (LTC) holder from carrying a handgun openly on the campus of an institution of higher education such as UT Austin. Students in this class should be aware of the following university policies:

- Students in this class who hold a license to carry are asked to review the university policy regarding campus carry.

- Individuals who hold a license to carry are eligible to carry a concealed handgun on campus, including in most outdoor areas, buildings and spaces that are accessible to the public, and in classrooms.
- It is the responsibility of concealed-carry license holders to carry their handguns on or about their person at all times while on campus. Open carry is NOT permitted, meaning that a license holder may not carry a partially or wholly visible handgun on campus premises or on any university driveway, street, sidewalk or walkway, parking lot, parking garage, or other parking area.
- Per my right, I prohibit carrying of handguns in my personal office. Note that this information will also be conveyed to all students verbally during the first week of class. This written notice is intended to reinforce the verbal notification, and is not a “legally effective” means of notification in its own right.

Title IX Disclosure

Beginning January 1, 2020, Texas Senate Bill 212 requires all employees of Texas universities, including faculty, to report any information to the Title IX Office regarding sexual harassment, sexual assault, dating violence and stalking that is disclosed to them. Texas law requires that all employees who witness or receive any information of this type (including, but not limited to, writing assignments, class discussions, or one-on-one conversations) must be report it.

If you would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more information about reporting options and resources, visit <http://www.titleix.utexas.edu/>, contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419. Although graduate teaching and research assistants are not subject to Texas Senate Bill 212, they are still mandatory reporters under Federal Title IX laws and are required to report a wide range of behaviors we refer to as sexual misconduct, including the types of sexual misconduct covered under Texas Senate Bill 212. The Title IX office has developed supportive ways to respond to a survivor and compiled campus resources to support survivors.

Faculty members and certain staff members are considered “Responsible Employees” or “Mandatory Reporters,” which means that they are required to report violations of Title IX to the Title IX Coordinator. **I am a Responsible Employee and must report any Title IX-related incidents** that are disclosed in writing, discussion, or one-on-one. Before talking with me or with any faculty or staff member about a Title IX-related incident, be sure to ask whether they are a responsible employee. If you want to speak with someone for support or remedies without making an official report to the university, email advocate@austin.utexas.edu For more information about reporting options and resources, visit the Title IX Office or email titleix@austin.utexas.edu.

Assignment overview

Assignment expectations, rubrics, and directions will be discussed in class.

Assignments	Percent of Total Grade	Due Date
1. Class Participation	15%	Throughout
2. Weekly Labs	15%	Throughout
3. Weekly Reading Responses (8)	15%	Wks 2-4, 6-7, 10-12
4. Problem & Solution Pitch	5%	Wk 5: February 16
5. Project proposal	10%	Wk 8: March 9
6. Final project and presentation	40%	Wk 16: May 4

Assignments, Directions, and Rubrics available on Canvas course website.

Grading Scale

This class employs a plus/minus grading system. For more information on this system, please consult the University's *General Information Catalog*. Below is the grade scale the University employs and which will be used in this class:

Meets major requirement		Does not meet requirement	
Grade	Points	Grade	Points
A	≥93.00	C-	70.00-72.99
A-	90.00-92.99	D+	67.00-69.99
B+	87.00-89.99	D	63.00-66.99
B	83.00-86.99	D-	60.00-62.99
B-	80.00-82.99	F	<60.00
C+	77.00-79.99		
C	73.00-76.99		

COURSE AT A GLANCE

Week, Date	Topic	Lab/Activity	Note or Major Deadline
Week 1, January 19	Introduction	ImportHTML	
Week 2, January 26	Definitions	UFOCSV	Reading Response
Week 3, February 2	Early structures	Dublin Core	Reading Response
Week 4, February 9	Digital, open, linked I	OpenRefine	Reading Response
Week 5, February 16	Digital, open, linked II	Presentations	Problem Solution Pitch*
Week 6, February 23	Schemas	Lab TBD	Reading Response
Week 7, March 2	Metadata in Society	Lab TBD	Reading Response
Week 8, March 9	Jobs discussion	Project Studio	Project Proposal Due*
Week 9, March 16	Spring break		No Class*
Week 10, March 23	Metadata and the web	Lab TBD	Reading Response
Week 11, March 30	Preservation Metadata	Lab TBD	Reading Response
Week 12, April 6	Access issues	Lab TBD	Reading Response
Week 13, April 13	Data Models	Project Studio	
Week 14, April 20	Metadata ideologies	Project Studio	
Week 15, April 27	Metadata today	Project Studio	
Week 16, May 4	Final week presentations	Presentations	Final Projects due*

All instructions, assignments, readings, rubrics and essential information will be on the Canvas website at <https://utexas.instructure.com>. Check this site regularly and use it to ask questions about the course schedule.

Changes to the schedule may be made at my discretion and if circumstances require. It is your responsibility to note these changes when announced (although I will do my best to ensure that you receive the changes with as much advanced notice as possible).

In class labs during units II and III (Week 6-12) will be crafted to course participants' pacing from unit I. Project studio activities will allow small groups to work on their final projects.

COURSE READING SCHEDULE

Unit 1, weeks 1-5

Week 1: Introduction to the course

Please bring your machine to class and download the [Chrome browser](#) in advance.

In class lab: Screenscraping tables and links using importHTML and importXML.

Week 2: Definitions

Weekly response due day before class.

1. Gartner, Richard. "Chapter 1. What Metadata is and Why It Matters," Metadata: Shaping Knowledge from Antiquity to the Semantic web. Springer, 2016.
2. Gilliland, Anne J. "Setting the stage." Introduction to metadata 3.0 (2008): 1-19.
3. Kitchin, Rob. "Chapter 1. Conceptualising Data," The data revolution: Big data, open data, data infrastructures and their consequences. Sage, 2014.

Week 3: Early metadata structures



Weekly response due day before class.

1. Gartner, Richard. "Chapter 2. Clay, Goats and Trees: Metadata Before the Byte" Metadata: Shaping Knowledge from Antiquity to the Semantic web. Springer, 2016.
2. Kitchin, Rob. "Chapter 2. Small Data, Data Infrastructures and Data Brokers," The data revolution: Big data, open data, data infrastructures and their consequences. Sage, 2014.
3. Schifman, Jonathan. "How the Humble Index Card Foresaw the Internet," Popular Mechanics, 2016. <http://www.popularmechanics.com/culture/a19379/a-short-history-of-the-index-card/>

Week 4: Metadata becomes digital, open, and linked

Weekly response due day before class.

1. Digital," Metadata: Shaping Knowledge from Antiquity to the Semantic web. Springer, 2016.
2. Kitchin, Rob. "Chapter 3. Open and Linked Data," The data revolution: Big data, open data, data infrastructures and their consequences. Sage, 2014.
3. Krajewski, Markus. "Tell Data from Meta: Tracing the Origins of Big Data, Bibliometrics, and the OPAC." *Osiris* 32.1 (2017): 224-240.

 Let's save some trees 

Readings, assignments, and activities for Unit 2, weeks 6-10 and Unit 3, weeks 11-15 will be released on the Canvas course website.