Oral History, METS and Fedora:
Building a Standards-Compliant Audio Preservation Infrastructure
Outcomes of Columbia University Libraries’ 2008-2010 Mellon-funded Audio Preservation Project

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  – Director, Libraries Digital Program Division

• Janet Gertz
  – Director, Preservation & Digital Conversion Division
What we’ll cover

• Janet
  – Project background
  – Identifying and describing content and versions
  – Physical organization vs. intellectual organization

• Stephen
  – Metadata
  – Digital asset management, preservation, access
  – Conclusions
The Problem

Mellon-funded survey in 2005-2007 found 35,000 pieces of unique analog audio aging rapidly in Columbia special collections

http://library.columbia.edu/services/preservation/audiosurvey.html
Audio preservation standards as of 2008

• Standards for digitization of audio well established
  – 96 kHz, 24 bit, Broadcast Wave format

• Standards for structural, technical, and preservation metadata still evolving
  – No clear model for METS for digitized audio
  – Audio Engineering Society draft standard
DRAFT
Standard for audio preservation and restoration - Administrative and structural metadata for audio objects

Abstract

This standard provides a vocabulary to be used in describing structural and administrative metadata for digital and analog audio formats for the purpose of enabling audio preservation activities on those objects. Some implementations also refer to this metadata as technical metadata. The characteristics of the audio objects captured by this standard may be of use to audio communities beyond the audio preservation community.
AES-X098B Superseded By:

• AES57-2011-f (2011)
  *AES standard for audio metadata - Audio object structures for preservation and restoration*

• AES60-2011-f (2011)
  *AES standard for audio metadata - Core audio metadata*
Sound Directions: Best Practices for Audio Preservation

This publication presents the results of research and development carried out by the Sound Directions project with funding from the National Endowment for the Humanities in the U.S. Each chapter in this document is divided into two major parts: a preservation overview that summarizes key concepts for collection managers and curators, followed by a section intended for audio engineers, digital librarians, and other technical staff that presents recommended technical practices while summarizing our findings and experience.

Publication Download (PDF format, 5.52MB)

The appendices to the publication provide additional technical detail for those interested. There are five appendices:

- **Appendix 1: Metadata Elements in the Audio Technical Metadata Collector (ATMC)** (522KB)
- **Appendix 2: XML Produced by Harvard's Audio Object Manager for Digital File Metadata** (XML format - 6KB)
- **Appendix 3: Sample Harvard METS Document** (XML format - 565KB)
- **Appendix 4: Sample Indiana METS Document** (XML format - 133KB)
- **Appendix 5: Software Tools in the Harvard Sound Directions Toolkit** (96KB)

NOTE: Appendices two through four are examples of metadata documents in their raw XML form. Some web browsers will present this information in a separate window as text, revealing the structure of the document immediately. Some browsers will not and must be prompted to do so. In this case, please ensure that your web browser is set to "view source." You may also prefer to download the raw XML files and view them using XML editing software.
Purpose of Columbia’s project

- Build a sustainable program for audio preservation at Columbia
- Reduce need for time-consuming custom metadata and ingest work by Libraries Digital Program Division staff
- Improve efficiency and consistency
Programmatic goals

• Aim for same quality product as achieved by Harvard & Indiana in *Sound Directions*

• **But** — digitization and metadata creation by external vendors

• Establish CUL infrastructure
  – Quality control procedures
  – Metadata requirements
  – Ingest into Fedora
# Preservation priorities

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<th>Intellectual value</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Risk of loss</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
</table>
Archive

At the center of our work is our "living archive" of more than 8,000 aural and visual interviews that explore diverse topics in United States and global history.

News

Follow our blog for the most up-to-date reporting on CCOH's projects, collections, and events.

The Tool of History: A Public Discussion Tuesday, 12/6, at 6PM

50 Years: Amnesty International & Human Rights Advocacy Conference, Dec. 8 at 3pm

[Video] "United in Anger: A History of ACT UP"

Research

CCOH conducts innovative oral history research projects, which we add to our archive and use as the basis for educational programs.

THE RULE OF LAW ORAL HISTORY PROJECT

Check out our newest oral history project, featuring digitally available transcripts of interviews on the topics of the death penalty and Guantanamo Bay.

9/11 ORAL HISTORY PROJECT

This September will mark the official opening of our September 11, 2001 Oral History Projects. Information and availability to view.

Education

CCOH is dedicated to building the field of oral history, and making our archives and expertise of use to the public.

NEW! Consult our Oral History Bibliography 📚!
Oral History collections

- Our highest preservation priority
- Unique recordings held only at Columbia
- More than 8,000 interviews since 1948
- Over 15,000 physical objects
- Strong demand for access to the sound
- Many in poor condition
Project team

• Preservation & Digital Conversion Division
  – Project management, digitization, quality control

• Libraries Digital Program Division
  – R&D, METS, other metadata, Fedora ingest

• Columbia Center for Oral History
  – Selection, preparation, physical handling

• Bibliographic Control Division
  – Descriptive metadata, MARC records
Preservation results

• 555 interviews preserved
  – 1,346 original audio objects
  – 2,100+ hours of sound

• 1,841 digital audio files created

• 555 MARC records created
• 555 sets of METS records created
Infrastructure results

• System for METS records to describe
  – Files that represent the original objects
  – Files that represent the intellectual objects

• Incorporation of draft Audio Engineering Society metadata into METS records

• Procedures for ingest into Fedora
Project challenges

• Describing versions and formats
• Identifying the content
• Coping with the disconnect between physical organization and intellectual organization
Oral histories are complicated

- Original audio recording on a series of tapes or cassettes
- Digitized audio: arranged to put all parts in chronological sequence
- Transcript: edited to suit the interviewee; doesn’t perfectly match the original audio
- Digitized transcript
The Reminiscences of

ADOLF A. BERLE, JR.

The Oral History Research Office
Columbia University
July 1974
assumed responsibility for the debts of the states and also for the creation of currency. I may add that that had a good deal of influence on my life later, because when -- in 1933, when we had to meet economic problems, I naturally thought of the Hamiltonian technique and tried to undergird the debt structure of the United States then with federal credit, and I sometimes wonder whether it derived from that original study with Ned Channing.

Q: Who were some of your classmates at the time? What I'd like to do is trace three strands here, one, the impact of your father on social legislation, the impact of teachers, and the group of students that you associated with at the time.

Berle: A man who is four years younger than the college generation has some difficulties. You lose as well as win. If you win time, you may lose in associations. Actually the relations I had, especially in my first couple of years, were with the seniors when I came in. They were too far ahead to be worried about the youngster,
MARC records

• One record for analog versions
  – Paper transcript
  – Audio tapes, cassettes, etc.

• One record for digital versions
  – Digitized or born digital audio
  – Transcript in Word or other format
Carlisle, Kitty, 1910-2007,

Call Number: NXCP88-A1159
Location: Oral History, 801 Butler (Non-Circulating)
No status information

Carlisle, Kitty, 1910-2007,

Call Number: Carlisle, K.
Location: Oral History, 801 Butler (Non-Circulating)
No status information

Pre-code Hollywood collection
Oral history interview with Kitty Carlisle Hart,

Author: Carlisle, Kitty, 1910-2007, interviewee.
Title: Oral history interview with Kitty Carlisle Hart, 1979.
Description: Transcript: 805 leaves.
Tape: 1 reel, 12 cassettes.
Restrictions: Permission required for access.
Permission required to cite, quote, and reproduce. Contact repository for information.
Singers—Interviews.
Actresses—Interviews.
Motion pictures and music.
Musicals.
Music—Instruction and study.
Theater.
Television.
New York (State)—Politics and government—1951-
New York (State)—Social life and customs.
Oral history interview with Kitty Carlisle Hart

Author: Carlisle, Kitty, 1910–2007, interviewee.
Title: Oral history interview with Kitty Carlisle Hart [electronic resource], 1979.
Description: 13 sound files : digital preservation master, WAV files (96 kHz, 24 bit)
Restrictions: Permission required for access.
Permission required to cite, quote, and reproduce. Contact repository for information.
Also Listed Under: Diamonstein-Spielvogel, Barbaralee, interviewer.
Identifying the content

All we know is what someone has written on the container
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<th>Speed</th>
<th>Subject</th>
<th>Date</th>
<th>Footage</th>
<th>Recording Time</th>
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</thead>
<tbody>
<tr>
<td>7 1/2</td>
<td></td>
<td>Lect 2</td>
<td>1/16/55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Done = 2/23/61

(Abraham Davidson)
Other information sources

- Transcripts
- Card file of interviewees
- Paper files of correspondence with interviewees and interviewers
- Staff memories
- Listening to the audio after digitization
If content identification is inaccurate, projects are difficult and more expensive

- Quality control must be slow and 100%
- Metadata requires significant revisions
- Vendor has to make many changes
- Version control is essential
Disconnect between physical organization and intellectual organization
Oral histories are complicated

Session: basic unit of an oral history

- Single recorded sitting of ca. 1.5-2 hours
- Can number a few or more than 20 in one oral history
- Recorded over a period ranging from days to years
Mind / body disconnect

• One session = one tape
• One session = several tapes
• One tape = one session
• One tape = several sessions from one oral history
• One tape = sessions from several oral histories
• Several tapes = several sessions from several oral histories
• Preservation practice: make a copy that accurately represents the original object

• Patron needs: a coherent sequence of files that contain all and only one oral history
Solution

- **Preservation master file**
  - Accurately captured from the physical object
  - 96 kHz, 24 bit, Broadcast Wave format

- **Rendered file**
  - Concatenates all parts of an interview regardless of which master files they’re on
  - 96 kHz, 24 bit, Broadcast Wave format

- **ADL (Audio Decision List)**
  - Metadata that tracks which minutes from which master files make up the rendered file
Over to Stephen ....
Metadata

• MARC, AES, MODS, DUBLIN CORE, PREMIS
• ADL (AES Audio Decision List)
• METS (Metadata Encoding and Transmission Standard)
• RDF (Resource Description Framework)
• ORE (OAI Object Reuse and Exchange)
ADL (Audio Decision List)

- ADL specified in AES 31-3 standard
- Records edit decisions
- Designed to be imported into audio editing software to recreate those decisions
- Imperfectly supported by commercial software platforms
- Migratable, human readable (sort of)
<ADL>

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(ADL_ID) "06.64.43.52.01.01.01.04.01.02.03.04,"
(ADL_UID) A968ED0C-8A7-716B-ACE3-F484C25D1F30
(VER_ADL_VERSION) 01.01.00.00.03
(VER_CREATOR) "Wavelab"
(VER_RTR) 6.10_(build_340)
</VERSION>

(PROJECT>

(PROJ_TITLE) "Anderson_Judith_6880292"
(PROJ_ORIGINATOR) "Steinberg Media Technologies"
(PROJ_CREATE_DATE) 2009-03-11T15:23:13
(PROJ_NOTES) """
(PROJ_CLIENT_DATA) ""
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(SYS_BIT_DEPTH) 32
(SYS_GAIN) 0.0
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(SEQ_FRAME_RATE) 25
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(SEQ_SORT) 0
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(SEQ_DEST_START) 00.00.00.000000
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(Track) 2 ""
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"LLIO-6880292" 00.00.00.000000 00.47.12.01*0255 "".""N"
</SOURCE_INDEX>

/EVENT_LIST>

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(Cut) I 1 1-2 1-2

00.00.00.000000 00.00.01.04*3328 00.47.13.05*3583 R

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mode k_dvda_stereo
1L LF
2R RF
</WAVELAB_CHANNEL_MAPPING>
</ADL>
METS

• Relate master and rendered files to each other and to the ADL

• Include AES draft metadata for
  – Technical details of physical object
  – Technical details of digital object

• Technical details of capture process
RDF (Resources Description Framework)
Version of METS for Complete Interview

<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF xmlns:dc="http://purl.org/dc/elements/1.1/">
    <rdf:RDF>
        <rdf:Description rdf:about="http://test.cul.columbia.edu/rem/rdf/Trilling_Diana_7606158">
            <dc:creator>Trilling, Diana</dc:creator>
            <dc:title>Diana Trilling Oral History Interview</dc:title>
            <dc:type>audio</dc:type>
            <dc:description>Some of the source recordings may contain content unrelated to this interview.</dc:description>
        </rdf:Description>
    </rdf:RDF>
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Oral History Audio Data Flow

Analog Tapes → Digital Conversion

METS → Digital Audio

Fedora Repository

Library OPAC

Oral History Portal

Public Collections Viewer

Staff Collections Viewer
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<th>OHROFirstName</th>
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<td>Bella</td>
<td>Biographical Interviews</td>
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<td>Aldewereld</td>
<td>Siem</td>
<td>World Bank</td>
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<td>240</td>
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<tr>
<td>Aldrich</td>
<td>Alice</td>
<td>Allan Nevins Project</td>
<td>1 Sound tape reel. With: Lillian Bean, Day Tuttle</td>
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<td>2 sound tape reels.</td>
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Frank Capra Oral History Interview

From: Rendered Audio (Click for More Information)

Title: Frank Capra Oral History Interview
Form: oral histories
Project: Preserving Historic Audio Content
CLIO ID: 7024590
Record ID: http://test.cul.columbia.edu/aggregation/rdf/Capra_Frank_ANDOTHERS_xx-xx:5x:7024590_r
XML Metadata: MODS, DublinCore

2 Member Metadata

More information in CLIO

Title: Frank Capra Oral History Interview : Session 1, Unknown Date
ID: http://test.cul.columbia.edu/aggregation/rdf/Capra_Frank_ANDOTHERS_xx-xx:5x:7024590_r_1
Download Metadata: MODS, DublinCore

MIME Type Dimensions | File Size | Link
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audio/x-wav | 540505 Kb | [Download] [DC]
audio/x-wav | 1764924 Kb | [Download] [DC]

More information in CLIO

Title: Frank Capra Oral History Interview : Session 2, Unknown Date
ID: http://test.cul.columbia.edu/aggregation/rdf/Capra_Frank_ANDOTHERS_xx-xx:5x:7024590_r_2
Download Metadata: MODS, DublinCore

MIME Type Dimensions | File Size | Link
--- | --- | ---
audio/x-wav | 523985 Kb | [Download] [DC]
audio/x-wav | 1710982 Kb | [Download] [DC]
Frank Capra (1960), Transcript vs. Audio
(Noticed when preparing this presentation)

use this ability to create and ability to produce
motion pictures for something that would transcend entertain-
ment a little bit.

Now, having always been a positive person in my
philosophy, I began to think in terms of the triumph of
the individual. I don't know what brought that on.
Probably Hitler brought that on, I don't know. But I
began to react against these totalitarian institutions,
against the one-man-dominating-individuals, shooting
people in large numbers, and I suppose subconsciously
I began to put up the fight for man as an individual,
and the triumph of the human spirit over obstacles.

I certainly did have a hand in the writing and
conceiving of "Mr. Deeds." "Mr. Deeds Goes to Town"
started of course as a book written by a very well known
man, high up in Republican circles; it was a book about
a young man who had inherited a great deal of money.
Issues & Considerations

What did we achieve?

Were there other, simpler ways to do it?

Do we really need all that metadata?
Specific Outcomes #1

- the content is reliably preserved for the future
- the content is preserved as an original "content artifact"
- the content has been reorganized to provide a coherent "interview narrative"
- the process for rendering access files is replicable and correctable
Specific Outcomes #2

• technical ‘provenance’ has been documented
• content can be validated as “authentic”
• content is structured so that it can be managed bibliographically
• content (10 TB) has been ingested into our long-term preservation repository (Fedora)
• content can be made publicly accessible to the extent permitted by author agreements
Strategic Outcomes #1

- Well-developed structural model for digitization of oral history audio
- Fully-developed support by a vendor who can now produce standards-based output
- Solid procedures for local cataloging of analog and digital oral histories
Strategic Outcomes #2

• Built out tools and workflows for ingesting complex content into Fedora repository

• Developed new features for Fedora/Blacklight Staff Collection Viewer to accommodate complex content

• Columbia can share approach with other institutions starting similar projects
Were there other simpler ways to do it?

- Preserve only “content artifacts”
  - Leave providing good access to the future

- Preserve and provide access only to “interview narrative”
  - Do not store, describe or map master files
Right Decisions for This Project?

Our choices for this project did in fact fully meet our goals for preservation and access.

It was also a good choice to build out our existing Fedora / Blacklight and metadata environment rather than develop new, ad hoc approaches for this project.
Did we really need all that metadata?

Only time will tell ....
Questions?