Chapter 9

Sustainable Digital Scholarship:

Lessons from the Columbia University Libraries Podcast Publishing Initiative

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Introduction

Beginning a new library publishing program is an exciting and challenging proposition. At the start of any program, sustainability must be integrated into program planning. In this chapter we will share information about the technical infrastructure used to launch, maintain, and preserve a podcast publishing program in an academic library setting, from within a digital scholarship unit. We will also expound upon our decision-making rationale and include discussion about how the workflows we utilized or developed can be and have been used in the management of other electronic scholarly publishing programs offered by the Columbia University Libraries (CUL).

Program History

Library publishing has a reasonably long and varied history at Columbia University Libraries, beginning with the Center for Digital Research and Scholarship (CDRS) which was founded in 2007.[1] In 2018, CDRS was folded into Columbia University Libraries, and its staff and functions dispersed across several divisions. Developers and project managers moved to existing development and project management teams, while digital humanities and repository management staff became part of a new Digital Scholarship unit (DS). The new DS division hired an assistant director of scholarly communications who would, in turn, hire a digital publishing librarian (2018) and a scholarly communications technologies librarian (2020). These were the positions held by the authors during their time working together in CUL's DS unit.

The DS unit took a broad approach in defining "publications." In addition to taking over the administration of the journals program, the publishing program inherited stewardship for a variety of digital humanities projects, including notable works like the Women Film Pioneers Project (https://wfpp.columbia.edu/) and Digital Dante (https://digitaldante.columbia.edu/).[2] Not all projects that CRDS had previously published enjoyed the same level of ongoing stewardship by project owners, and some projects had reached the end of active authoring and development. This meant that there were several projects that the division no longer had access to edit; several were endangered due to expired domains or outdated server infrastructure and technologies. Even in the case of projects with ongoing stewardship and active use, project managers had not always developed systems to archive and index scholarly content beyond creating web-archived versions of the websites through Archive-It, which meant that the DS team was unable to provide the same level of searchability and access to archived, individually-authored items within these websites.

From the start, the digital publishing program began to address preservation issues and to develop a philosophy around novel forms of scholarly communication that defined each of these items as objects of scholarship, worthy both of preservation and a place in the scholarly record. As new services developed under the umbrella of publishing, preservation and responsible sunsetting were treated as critically important aspects of the digital publishing lifecycle. The digital publishing librarian created a framework to ensure that that all digital projects would be:

1. Discoverable and citable: The overall project and each individually authored and/or citable component must be web-searchable, indexed and/or cataloged as appropriate, and provided a DOI.
2. Archivable: In addition to utilizing web archiving to preserve the overall project and look and feel, it must be possible to provide long-term access at the level of individual citable artifacts and make those preserved artifacts searchable at the item level.
3. Divestible: It must be possible to sunset and migrate each project. This was achieved both through technical means, by preserving website data, metadata, and media files and by generating documentation that would allow us to reconstitute and migrate projects wholesale. Digital scholarship staff also developed policies and partnership agreements that would allow us to limit our periods of engagement with projects and to transfer ownership.

Podcasting Program Development

Podcasting was the first new service designed by the digital publishing librarian. During the 2018-2019 academic year, numerous informational interviews and surveys were conducted across campus to pinpoint publishing interests and needs. Podcasting was a medium drawing intense interest across campus, including among professional schools like the Columbia School of Journalism, Teacher's College, and Columbia Law School.

For faculty at the university, podcasting appealed as a novel way to share research and to converse with audiences outside of the academy. As an increasingly popular format that is considered especially "portable" as an asynchronous and mobile-delivered media, podcasts are much more broadly consumed than traditional academic publications. Yet their immersive and episodic qualities make them an excellent medium for breaking down complex concepts into digestible information and introducing scholarly information in a relatable, conversational, and entertaining way.[3]

This cultural relevance and ubiquity made podcasting a popular service proposal for students at all levels who were interested in professionalizing or publicizing their research with audiences within and outside of the school.

Most students can record and edit a podcast with only a laptop and a mobile phone, although acquiring a facility with professional recording equipment and sound editing tools also appeals to students studying the arts and journalism because of the relevance those skills might have to their future careers.

For educators, podcasting was intriguing as a form of open pedagogy. In lieu or in addition to crafting academic papers, many faculty found podcasting to be a fun way to engage students, especially during the semesters of remote learning necessitated by the global pandemic in 2020 and 2021. Podcasting also offered the opportunity to engage students in discussions about narrative, storytelling, and other effective and creative ways to communicate scholarship.[4]

Each of these partners would need to utilize the same technologies, but would have different goals for publishing and discoverability, the need to quantify impact, and the longevity of the scholarship. Faculty and graduate students creating podcasting projects would have the largest need to treat podcasts as scholarly artifacts. These partners would put time and effort into podcasts they hoped might become well known and would want to demonstrate the impact of their work and add it to their permanent scholarly resumes. Students, especially undergraduates, might want to be able to share their podcasts as portfolio items, especially in the immediate period after they graduate. But in many cases, young students may be indifferent to the ongoing or indefinite availability of these material; we know from our work partnering with students on other kinds of publishing partnerships that it is often desirable to set an expiration date on those materials or to make it possible to request their removal from the web down the line.[*] Faculty working with students in curricular settings may not want to have the works publicly published at all. Students with coursework designed to be published would need to sign consent forms and author agreements, receiving education about the implication of signing those documents, but it was

* *The Morningside Review* (https://morningsidereview.org) is a journal publishing essays written by undergraduate students in Columbia University's first-year writing program. Morningside Review texts used to be archived in the Academic Commons repository, but there were numerous incidents where alumni requested for their work to be removed as their opinions, style, and careers evolved. When items were hosted in the repository at permanent links and given DOIs, it was undesirable to remove access to the item and felt irresponsible to eliminate the record of the citation entirely. Due to the volume of takedown requests and with the support of the writing program's faculty, we chose to exempt *The Morningside Review* from our repository archiving program.

often desirable to have a plan to take down these materials after a period without archiving or to be able to take them offline by request.

Because of the demographics of our podcast platform users, CUL's DS unit firstly is cautious about depositing works to Academic Commons that have been created by students and may be of a personal nature. Instructors who teach using the podcasting program are similarly cautious. Even with this caution, DS staff do sometimes receive requests to have podcast course websites removed from the CUL's platform(s) before the planned date of sunsetting. In these cases, DS staff respect the wishes of the creators and remove the content from the public web, working with them to have the content removed from the browsable Wayback Machine and/or CU Archive-It instance as needed. In addition, it is important that students—especially undergraduate students—have the choice to exclude their early work from the scholarly record, so far it is possible.

Podcast Publishing Services

Although several third-party platforms were considered for podcast distribution, CUL selected WordPress as our content platform.[†] Given our desire to control access and potentially to delete content, we eschewed commercial podcasting tools in favor of open-source software that provided this greater degree of intellectual property management. WordPress was designed as a blogging platform, and the serial nature of podcasts mimics the publishing practice of blogs. Podcasts are published to the various podcast directories and their applications, such as Apple Podcasts, Spotify, Stitcher, via a longstanding metadata protocol called RSS (Really Simple Syndication). Blogs and other serially publishing websites have also utilized RSS to deliver content to centralized feeds and so WordPress, although primarily considered a textual publishing platform, had several key capabilities that would allow us to deliver podcasting services to our community.

† Deciding where to host a content platform is complex and dependent on institutional policies and resources. It is helpful to consider several options, including internally-managed services as well as externally-hosted solutions. Decision makers may find it cost-effective to work with an external vendor for some period of time, such as for a pilot program duration, with clear documentation about future migration and/or the process for ending an agreement with a vendor. See Chapter 1 (Guimont and Potter) of this volume for additional considerations.

CUL created a custom template that would allow podcasts episodes to preview on the front page of each podcast website in lieu of blog posts. The Castos Seriously Simple Podcasting plugin (https://castos.com/seriously-simple-podcasting/) allowed our podcasters to easily upload mp3 audio files for each episode as well as space to author show notes and post transcripts.[5] The plugin also collects metadata on each episode, and this information is bundled into an RSS feed that we could distribute to four major podcast apps/aggregators. Podcasters were given access to the software platform for a period of three years, during which time, CUL provided hosting and performed basic maintenance and technical support. A fifth-level custom domain based on the URL podcasts.library.columbia.edu was assigned to each site.

Podcasters were required to attend a two-part training. For the first part of the training, they were walked through the partnership agreement in detail, which included an author agreement, wherein the podcasters licensed their content to CUL for publication on the live websites and in the university repository, Academic Commons. They consented to practices such as the use of guest consent forms and creation of transcripts for accessibility. To enable preservation, podcasters were required to generate preservation copies of the transcripts and show notes they posted to their WordPress sites. In a secondary training podcasters were introduced to the WordPress platform, and the Seriously Simple Podcasting plugin. Asynchronous training materials were also provided.

Podcast Publishing and Preservation

With the tools available to us, we decided that depositing individual podcast episodes into the Academic Commons repository annually was the best way to publish and present the content as "official" scholarly works, as well as preserve the materials using existing library infrastructure. Academic Commons provides DOIs to all deposited materials and facilitates indexing of those materials through various platforms including Google Scholar (https://scholar.google.com/) and OpenAlex (https://openalex.org/) (via DataCite records). Works included in the repository are also accessible to researchers through both a rest API and an OAI-PMH endpoint.[6]

It's helpful to pause here and consider the differences between preserving and publishing. In some ways, the institutional repository exists in a liminal space within library and archival storage as a service. Depending on the needs of the person or organization depositing works into the repository, it may fill the need of publishing (i.e., the primary platform from which a work is distributed) or of preservation (i.e., a permanent, additional copy of a work, which may or may not be exactly usable in the same way as the original). What's important to remember is that once a work is added to the institutional repository, CUL has made a commitment to provide continuous, permanent access to that work. Although the repository may provide some services that are similar to a publishing platform (e.g., the creation of DOIs, indexing in Google Scholar), it is first and foremost a preservation platform.

We would be remiss if we didn't refer readers to the extensive, seminal, and helpful work done by Molly Schwartz, Mary Kidd, and Dana Gerber-Margie in the *Preserve This Podcast* series (https://preservethispodcast.org/),[7] its associated GitHub project,[8] and resulting publications.[9] Additionally, the monograph *Saving New Sounds*, edited by Jeremy Morris and Eric Hoyt is essential reading for those who are interested in exploring the topic of podcast preservation in greater depth and detail.[10]

Because of our continuous work with digital projects of all vintages and needs, we knew that the preservation of podcasts was an essential component of the program. Podcast preservation is not a term that has an agreed-upon meaning across industries. From an audio preservation standpoint, to preserve a podcast one should first meet certain standards of audio production.[11] From a podcast production standpoint, one would ideally preserve each separate element of the materials used to create the episodes, or at least as many elements as might be useful to producers later. This could involve raw footage, such as interviews, work files created in a specific audio editing program, caption files, media (e.g., stock) that has been sampled within the edit, and even stock logs. If an episode is preserved as a whole, that episode should be in a lossless format, such as WAV or FLAC. Another aspect of preservation that is emphasized in existing literature is the importance of naming conventions, so that collections of materials are usable if metadata is not created, or associated metadata is lost, and so that component pieces of media are retrievable based on project templates or work files. Fixity checks, using technologies such as checksum, are recommended, but not often utilized unless preservation happens at an institutional level.[12]

From a library perspective, preservation should involve keeping multiple copies of a work in different locations, such as on-prem and cloud storage, and even working with external preservation services, such as LOCKSS (https://www.lockss.org/) or CLOCKSS (https://clockss.org/).[13] An emphasis is placed on metadata, including descriptive, administrative, and structural metadata, which travels with the object throughout its lifetime.[14] Fixity checks and forward-migration are other important concerns for libraries and archives that seek to preserve digital content, including audiovisual/multimodal works.

In the case of Columbia University Libraries, born-digital materials are often deposited into Academic Commons (https://academiccommons.columbia.edu/), the digital/institutional repository. Works deposited into the repository are typically stored in two locations. The software stack/suite that powers the repository provides the ability to host a preservation copy of a work, as well as an access copy, allowing for the storage of larger files and quick user access to web copies. Fedora, the preservation layer, supports fixity checks. For materials requiring a higher level of preservation, Archivematica workflows are used.

In addition to the repository, Columbia University Libraries runs a web resources collection program through the Columbia University Archives: "The Columbia University Libraries (CUL) web resources collection program archives selected websites in thematic areas corresponding to existing CUL collection strengths, websites produced by affiliates of Columbia University, and websites from organizations or individuals whose papers or records are held in CUL's physical archives."[15] This program utilizes Archive-It, a web archiving platform from the Internet Archive which uses the same technology as the Wayback Machine. "Archive-It is a service that allows institutions to preserve materials they have archived from the web … and includes forever storage of archived materials. Archive-It partners also have perpetual access to these archives, even after they discontinue active use of the service."[16]

With all that in mind, both Academic Commons and the Columbia University Archives' instance of Archive-It were selected as the mechanisms by which podcasts produced through the CUL podcasting program would be preserved.

Preservation Workflow

The preservation, or what we call "archiving," process is done annually. Based on a set of automations, our task management software, Jira, creates tickets annually in a specific project for each podcast title, where staff can track their work. Not every podcast is archived in Academic Commons. Some podcast series are meant to be more ephemeral and not preserved. Jira tickets are created only for the podcasts for which creators have agreed that content should be preserved in Academic Commons. Once the Jira tickets have been created, staff reach out to the partners to let them know that the annual archiving process is about to begin and ask for a point person to help with preparing metadata.

A shareable folder is created for each podcast into which are put the episode audio files, episode transcript PDFs, and a metadata spreadsheet. The metadata spreadsheet is created by munging the RSS file in OpenRefine (https://openrefine.org/), and running a series of transformations (or a "recipe") on the resulting data, normalizing it for partner edits and eventual ingest into Hyacinth (https://github.com/cul/ldpd-hyacinth), the cataloging backend for Academic Commons and other CUL products. FAST subject headings (https://fast.oclc.org/searchfast/) are also applied in OpenRefine as a part of this process. Working in OpenRefine has the benefit of users being able to export their JSON recipes and reuse them in future years, thereby reducing the staff time needed for cataloging processes as time goes on.

After the spreadsheet is complete, there is some manual review needed to remove all episodes that have already been deposited in Academic Commons. This can be done relatively quickly by looking at episode date stamps. Once the final set of episodes is ready, the spreadsheet is shared with the partner so that they can add creator information for each episode (e.g., names and Columbia identifiers, also known as "UNIs," which are used to send monthly usage statistics to creators) and fix any errors that may be present. After all edits are complete and all files are present, CUL staff can use a bulk process to deposit all new episode content into Academic Commons.

In Academic Commons, each podcast is set up as a featured series. This means that each podcast can be accessed through a custom/friendly URL, and that a logo and blurb for each podcast are returned in search results for users of the repository (e.g., *Voices in Bioethics* podcast [https://voicesinbioethics.podcasts.library.columbia.edu/]).[17])

Extensibility

One can't delve into podcast preservation without being at turns delighted and frustrated by RSS, an XML-based protocol:

> the metadata and the open feed [of RSS] are what separate a podcast from other media files on the internet, including other forms of on-demand audio (for example, music streaming platforms and audio book companies). Because RSS feeds are open, podcasting is platform-independent. Listeners can subscribe to feeds through a number of different podcatching apps and a variety of platforms.[18]

Developed to share text-based content,[19] embraced by blogs,[20] and adopted by podcasters (initially as "audio blogs"),[21] RSS is a flexible protocol now in its twenty-fifth year of life on the internet. We leveraged RSS in our workflow to do the heavy lifting of crosswalking creator-generated descriptive metadata into our repository.

While RSS is currently the protocol of choice for podcasting, with text-based RSS feeds a thing of the (recent) past, could there be a future in which RSS is used to serve scholarship from our repository, as part of the preservation process? When we consider more traditional mechanisms of scholarly content dissemination, such as OAI-PMH endpoints, KBART files, and rest APIs, perhaps RSS still has a role to play. Even if RSS has no place as a distribution protocol outside of podcasting, the files themselves can be leveraged to create descriptive metadata, and as research materials and guides.[22]

Takeaways

While not wishing to stray too far from our case study and discussion of the podcasting program at CUL, over the course of developing these workflows we noted that our research and conceptual framing of a published, digital artifact affected the way we managed and designed other partnerships and projects within our portfolio. The basic criteria we developed for publishing podcasts—that they must be discoverable, citable, available long term, and divestible—were adopted as a set of essential services across the entire publishing program.

A Project is the Sum of Its Parts

Our work to identify strategies for publishing and preserving the podcast on the episodic level, as a series, and a web-based project informed our understanding of whether we had met these criteria for the individual objects a researcher might want to access and cite within a larger digital project. As Owens notes, "The fuzziness of boundaries of digital objects means that the concept of 'item' and 'collection' is less clear than with analog items. For example, a website might be an item in a web archive, but it is also functionally a serial publication which changes over time. A collection of web pages are themselves a collections [sic] of files."[23] This meant that we needed to be flexible and develop workflows around individual projects, instead of expecting the projects to fit existing workflows.

For instance, one of our longstanding digital reference publications, *Women Film Pioneers Project* (*WFPP*), has been published on WordPress since its debut in 2013. *WFPP* publishes valuable information on female figures in the early film industry, some of whom are not biographized anywhere else online. CUL had generated a MARC catalog record for the project, which was thus displayed both in CLIO, the CUL catalog, and in WorldCat. The site was web archived via the Columbia University Archive-It account and searchable via the Wayback Machine. By providing indexing and archival services at the level of the site overall, we were indeed preserving the content, but we were unable, through the Wordpress platform, to make individually authored biographies and topical essays searchable and discoverable in academic indexes and did not offer DOIs or permanent links to these items for those who might wish to cite the *WFPP*. These failings would be especially profound if the site might be deprecated or cease to operate.

WFPP provides two primary forms of peer-reviewed scholarship—single subject biographies and thematic essays—but also offers valuable and novel ways to explore the landscape and network of female film professionals through occupational and geographic metadata that is built into the site architecture. To fully provide long term access and discoverability to the project, we generated preservation copies of all individually authored components to catalog into the repository, where they would be published with a DOI and indexed to several academic databases. However, to capture the full value of the project, it is necessary for the site structure and functionality to be preserved via more holistic archiving via Archive-it.

Partnership Structures and Management

This change in our services also necessitated revisions to our partnership agreement with the *WFPP* team. To streamline the preservation process and ensure timeliness, we requested that the partner generate the PDF versions of newly published materials and provide metadata for each new essay and biography to the repository manager. They would also be responsible for publishing the DOI and a link to the repository-hosted version of the object on the live website once these items were cataloged into Academic Commons.

In addition to amending individual or programmatic partnership agreements, we needed to examine the alignment of existing preservation protocols with new services. The right to be forgotten and our efforts to customize how long materials would be made available via the web are complicated by blanket web archiving practices that are deployed across all websites bearing "columbia.edu" domains. To truly offer the level of control we desire for students and educators using digital publishing tools to learn and ideate, we need to consider website protections like password protected sites and scripts to block web crawlers. We also need to speak frankly about the implications of web publishing with our prospective partners and have policies in place to protect all participants with informed consent, through partnership and author agreements, as well as guest consent forms.

Conclusion

Library preservation feels, at times, like a constantly moving target. When we think about the mammoth challenge of preserving the born-digital—and often dynamic—content of our institutions, we should look to what already exists, adapt it to our needs, and be creative when it comes to developing workflows and utilizing existing technologies.

In this chapter we outline an ethos and technical workflow that we believe can serve as a starting point for other programs who are interested in publishing podcasts. We also hope that this set of strategies may provide a guide for sustainably publishing other varieties of digital projects. We urge other library publishers to consider a holistic approach to indexing and archiving projects as a whole and a set of component parts, and to select technologies and policies that work together to accommodate migration, sunsetting, and responsible stewardship for born-digital artifacts.

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