Digitizing Student Work: Access and Engagement in a Tech Comm Digital Archive

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Digital archives of student work have substantial value for students and instructors in the technical and professional communication (TPC) field; however, developing a usable archive comes with several challenges. This case study reports on the development of a digital archive that began as a library of physical projects that could act as a useful model for others. We explain the process of justifying and developing an archival plan, digitizing media, and developing a user-friendly interface. We explain the goals and benefits of building a student digital archive as well as how to make it accessible, discoverable, and searchable. During the creation of this archive, we built a system of metadata to facilitate discovery and searchability. We also developed a database that feeds a web interface to ensure the archive is scalable and usable. This project's development is meant to help promote student success, digital literacy, and an increase in access to local resources that have not previously been available.

Student digital archives provide students with several opportunities, not only as platforms for showcasing work but also as tools that help students connect with writing in several ways. Digital archives come in many forms, but an archive is more than a collection of digitized files. Archives are designed to ensure users can effectively engage with the content through the use of planned organizational patterns and methods of engaging with the material. Archives of student work can have several additional benefits for classes and programs related to peer learning, digital literacies, and program assessment.

In the writing classroom, the value of writing assignments is significantly enhanced when students perceive real-world relevance in their tasks. Projects that resonate with real-world goals and offer authentic, context-based constraints—such as client-based projects or community engagement tasks—underscore the importance of the work, boosting student motivation and engagement. The knowledge that their work might have an impact beyond the classroom can inspire students to produce higher-quality and more authentic projects.

In this chapter, we present a case study detailing the development of a student project archive in a department of technical communication. We explain our motivations, process, and lessons we learned as our project developed.

Why a Digital Archive?

In our technical communication department, a collection of projects has accumulated over a couple of decades. The student projects are physical copies, stored in binders on bookshelves in a locked room. The binders contain samples of student work and reflections that are sometimes used as examples for current students. The archive of physical projects has been a useful resource, but it is underutilized and takes up several bookshelves. As a department, we have been working to use space more economically, so we developed a plan to remove the bookshelves containing the physical projects. As part of the discussion, we decided we did not want to lose the projects because they have been valuable. While discussing our plans for removing the physical archive, we began exploring the possibility of digitizing the collection.

As the discussion progressed, we realized that additional problems could be solved through a digitization effort if we could take advantage of their digital format. We determined that the existing conditions limit access and the usefulness of the physical collection when compared to the possibilities of a digital collection. The room with the bookshelves is a lab that is locked with a code, and it houses classes throughout the week. The binder setup also makes it difficult for students to find relevant information; students have to sift through outdated and irrelevant information to try and find what they need. In their physical form, the projects are poorly organized, can only be viewed by one person at a time, and require users to access the space. We realized that each of these challenges could be eliminated with a digital collection. To effectively use the project archive in the way we want, we must grant students access, and a digital collection makes this a more manageable task. Based on our situation, we determined that a digital archive could help us open valuable space while improving access and usability of the student projects. This project was largely driven by the participation of students but was initiated and sponsored by faculty; through the input of student experiences many of our goals were established and defined.

The Uses of Digital Archives in Writing and Communication

Before deciding to digitize the projects and develop an archive interface, we set out to analyze and evaluate the benefits of building a digital archive, the

goals the archive would serve, and the design features that would be most important for ensuring the archive is usable. We quickly found several uses for digital archives that are worth consideration for TPC and writing studies. We also found that the uses of digital archives, like the one we were building, create several opportunities we had not previously considered. In the body of scholarship about digital archives and writing instruction, scholars and educators have argued that digital archives improve engagement and student confidence, improve accessibility and inclusion, create new opportunities, and improve digital literacy for both students and faculty.

Digital archives help develop digital literacy

A goal outlined for some archive projects is to improve students' digital literacy and the competencies that come from working with digital content. Using an experiential design, Chen and Chen (2010), showed that having students engage with specialized digital collections instead of using search engines had positive outcomes. Their research concluded that digital archival-based research yielded better learning experiences than open digital resources such as search engines. This is largely because open resources provide more irrelevant or distracting content and impose a higher cognitive load due to the sheer amount of information that users must engage.

Benefits for digital literacy and the use of a digital archive are also described by Comer and Harker (2015) who discuss the *Digital Archives of Literacy Narratives* (DALN). DALN, while not primarily used as a teaching tool, led to students being able to compare research, opinions, and stories more cohesively due to the information existing in the same space. The focused nature of the platform creates conditions for students to deepen their understanding and make strong connections.

Another platform that takes a different approach is described by Burnham and Tham (2021). They explain how instructors have used the *Fabric of Digital Life* project and that the archive of technologies is used as part of several pedagogical approaches. Burnham and Tham found that there are several strategies for using digital collections as a teaching and learning resource, and that there are numerous skills that can be developed through engagement with the platform.

Working with digital information is a necessary skillset in modern information contexts, and giving our students opportunities to use a wider range of tools and interfaces is a valuable learning activity. Rosinbum (2017) found that students who engage with archives are not only building their communication skills and digital literacy but also their overall understanding of digital platforms. Like all of us, students are likely to turn to the most used and

flexible digital tools when working. Search engines may have their uses, but some types of information are stored in more specialized systems, and students can and should develop an awareness and familiarity with a wider range of digital tools for finding and engaging with information. Specialized databases, digital archives, and other platforms provide a layer of learning that can add additional opportunities for students to develop valuable skills and critical awareness during their writing and research activities.

Authentic Context Builds Confidence and Investment

Digital archives that are well-designed and align with the content of a course can improve the learning process of students. When students have the opportunity to engage with material that more closely represents the work they are practicing in the classroom, there are several benefits. For example, Jackson et al. (2019) discussed the improvements in student motivation that can occur when students anticipate that their work will be added to an archive. They explain that having a sense of real future readers encourages students to produce engaging and meaningful work as it helps them to see that they can contribute to the scholarly communication cycle. Jackson' et al.'s argument aligns with the prevailing understanding in writing studies disciplines that our ideas must be understood in context—the archive can provide contexts.

Developing authentic context for students can take other forms, as shown by Nardone et al. (2020) who discussed the motivational benefits and contextual awareness that come from providing a focused and authentic space for technical and professional communication (TPC) students. According to Nardone et al., when students are able to contribute to a space that is user-friendly, student-led, and allows for creativity, it leads to students producing more creative solutions, engaging in collaboration, and doing more thoughtful research. When it comes to student engagement and learning, these studies indicate that when students can connect writing tasks to work beyond the borders of the classroom, they are given the conditions to become invested in their work. A student digital archive not only provides a space for students to contribute their own work but also allows them to make connections between their efforts and the work of others.

Authentic context and thinking beyond the immediate evaluation encourage students to take the reins and work as producers in a space that has work that is especially relevant to them. Bruff (2019) used this idea, positioning students as producers instead of passive receptors of knowledge. Bruff explained that positioning students as producers means engaging them in open-ended problems, providing authentic audiences, and supporting

student autonomy. The key to this model, like many student-centered learning theories, is providing students with authentic and meaningful contexts, exigencies, and opportunities that are not limited to evaluation exercises. We see specialized digital archives as an opportunity to implement many of the ideas described by Bruff and student-centered theories of teaching and learning.

Developing a New, Local, Student-Focused Archive

Since our program has already been collecting student projects for many years, we saw an opportunity to improve the ways students and faculty access the materials. While a digital collection should provide benefits, a poorly organized collection of computer files may be even less visible and useful than the physical form. In developing this project, we recognized that building a digital archive requires an approach and design to maximize the value for its student and faculty users. The archive needed to include features like searching and filtering that help students access and engage with the material, and the archive infrastructure needs to be maintainable and scalable to ensure sustainability.

The Design Plan

As an academic program, developing a digital archive presents several challenges related to resources, time, collaborators, and skillsets. Thinking strategically, however, it becomes clear that the process of designing a digital archive is itself an excellent learning opportunity. We identified several facets of this project where both students and faculty could use this process to practice or develop relevant skills. We began with digitizing physical content, cleaning and processing files, creating information taxonomies, and designing an interface.

As we developed a workflow for the project, we also considered the design features that were most important for our users and use case. We spent time reading about other archives and discussing the archive with students and faculty, ultimately determining that information in our archive needed to have three characteristics to be successful. Projects in the archive needed to be: searchable, discoverable, and accessible. That is to say that users needed to be able to find what they are looking for, they needed to be able to discover relevant information that they did not know to look for, and the interface and contents needed to meet accessibility guidelines. Our design priorities were shaped by a combination of the resources and problem that started the project, user feedback, best practices from existing archives, and a commitment to

inclusivity and user-friendliness. In short, we aimed to create an archive that was functional and user centered.

Knowing that the digitization process would take time and that there may be unexpected challenges along the way, we began by digitizing a smaller sample of projects. We began with twenty projects that were randomly selected to be scanned and inventoried. The initial sample helped us finalize our design process, which we describe below.

Digitizing

For digitizing our physical projects, we used a book scanner. The projects are primarily paper-based projects, so scanning files into a document format is the primary task. The book scanner has dedicated overhead cameras to ensure consistency, quality, and speed during the scanning process. We set up a dedicated computer with the scanner in our lab, which establishes a workflow for digitizing content for the archive, but it also establishes a new resource for students and faculty that has additional applications beyond this project.

Cleaning and Processing Files

Digital scans of documents start as images. Effectively, a digital scan is a photograph that needs to be cleaned and processed before sharing. While the initial scans can be immediately saved in a document format (i.e., a PDF), doing so is not advisable. First, scans sometimes include distortions due to wrinkles or folds in the page, the angle of the scan may mean that text is poorly aligned, and the scan may pick up on unintended content like the table or fingers. Some scans may need to be rotated, cropped, or edited in some way to improve the quality. Then the image needs to be processed using optical character recognition (OCR) to convert the image to a text format. Scanned documents that have not been converted are significantly more limited because visual text cannot automatically be understood as text by the computer, which means that search functions and text-to-speech functions are not possible. This step is essential to improving the quality, usefulness, and accessibility of the files.

Developing a Metadata Schema

To maintain information about the projects, we developed a project inventory sheet. The inventory helped us keep track of the projects during the digitization process, but we also developed the inventory sheet knowing that the

categories in the inventory would be input into a searchable database. The information in the spreadsheet functions as the metadata for each project, providing robust and detailed descriptions about each project that makes it easier to find projects relevant to specific search parameters. The categories included in our schema are:

- Project ID (Unique number)
- Project Title
- Author
- Author Role
- Supervisor
- Project Type
- Client
- Completion Date
- Content List
- Access Permissions

These categories can be updated as project guidelines change throughout the following years of this project, but recording this information for each project is necessary for the functionality and responsible use of the archive. The search and filter system relies on this data as users look through the archive. The last item, access permissions, allows us to manage projects based on the consent of authors by allowing students to choose who can view their work. We decided to allow students to submit their work to the archive for use by faculty, faculty and students, or the public.

Building an Interface

The final challenge for development was determining how the information should be stored, accessed, and managed. While a file repository could be acceptable in some situations, we have endeavored to develop a web application. Developing the interface created another opportunity to collaborate as we worked with two students studying computer science. The web application contains a folder with all of the project files and a database containing the metadata for each project. The interface for the website allows users to find projects in the collection using their web browser. To develop the user interface, we first built an interactive prototype in Figma, which we used for an initial round of user testing.

After incorporating feedback into the design, we developed a working version of the archive that has the basic features needed. The archive was developed with the FastAPI framework, which will allow us to continue to develop and refine the interface and the archive architecture going forward.
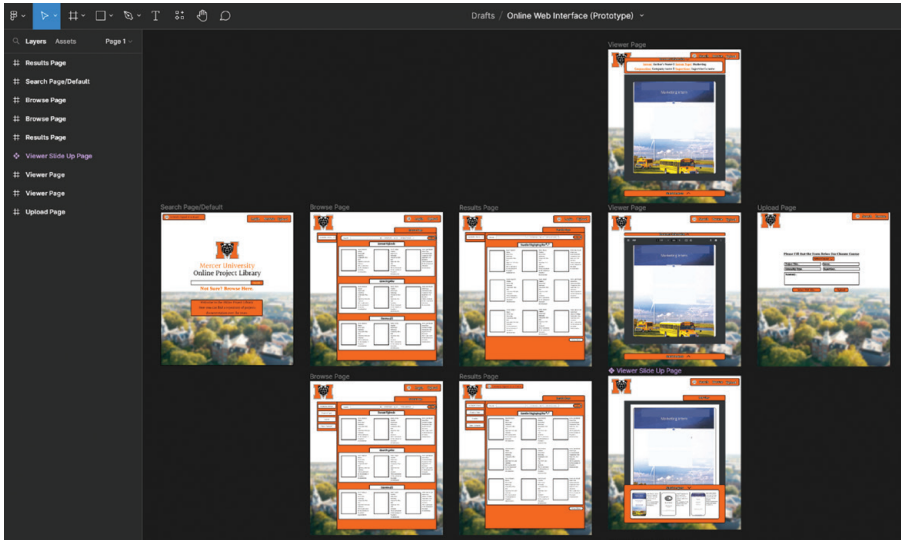
Figure 1-1. The prototype interface developed in Figma showing a search, browse, view, and upload screen with different states.

Discussion

Digitizing a collection of projects and building a digital archive has been an excellent opportunity to consider new possibilities, collaborate, and learn new skills. The archive is in an early development phase; however, as it takes shape, we are building an easily accessible repository of knowledge for current and future students. The archive will serve as an excellent resource for our students and faculty. Below, we discuss the ways our archive project illustrates a process and way of thinking that other programs can consider for their own contexts. It is important within the context of our own archival development to know that this project was aided through the support of our university. Programs considering the implementation of an archive should consider the time, resources, and labor needed before taking on a similar project. In our case, the support for student research was a key motivation for the project. to develop the platform, research, and content going into the archive itself.

Authentic Contexts and Students' Motivation

While researching we wanted to determine the value of digital archives by looking to the existing scholarship, and we found that this type of resource creates several pedagogical opportunities and benefits. Perhaps most

importantly, we can foster student investment by adding some authentic context for the work in the classroom. Students who use archives are more likely to build their knowledge and understand their research (Chen & Chen, 2010). Students given the opportunity to publish works within an archive are also more likely to work in a "producer" mindset, meaning that they will be more inclined to produce content of a higher quality. Making similar observations, Biswas et al. (2019) found that having students contribute to an undergraduate journal provided students with a sense of authenticity and added confidence. Inviting students to see themselves as part of an active community, one in which they can see the ways their work relates to an existing set of practices, adds clarity and significance to the goals of writing in the classroom.

Process, Product, and Feasibility of Building an Archive

In retrospect, there appears to be a clear roadmap for building the archive. However, this was not quite the case in the beginning. When designing this archive, we went through several iterations as we mapped out the steps and design priorities along the way. While scholarly research was helpful in establishing a rationale for using a digital archive, there was less guidance available on how to successfully build an archive that would meet our needs. This case study helps fill that gap by providing a breakdown of the necessary steps.

After determining that we wanted to build an archive of student projects, the tasks for developing the initial working version of the archive were to create an inventory of projects with a metadata schema, digitize the projects, develop an interface prototype to test with faculty and students, and build a web interface for the projects. When gathering the content for the archive, we streamlined our process to make it as easy as possible to convert the physical projects into useful contributions for the archive. The project inventory helped us establish the information that we could use to describe the projects and make a more searchable interface. The digitization process not only helped us create digital files, but also manage the quality, searchability, and accessibility of the files. After each file was scanned it underwent light cosmetic retouches to make scans cleaner and cohesive. After this, they were uploaded into Adobe Acrobat and turned into readable text. This was a critical step in building accessibility for students with disabilities into our platform. Fully describing the projects helps ensure that users will be able to find the most relevant projects when looking through the archive, and once they open a project, users will be able to engage with the files effectively.

Guiding Design Principles When Building a Student Archive

It was important to us that our archive met three basic principles: accessibility, searchability, and discoverability. Accessibility is the idea of being able to readily and easily access information. For us, this meant two different things: making the archive visually accessible to students who are disabled and making the information easier to gain access to throughout the year. Accessibility ensures that faculty will be able to see student input on their courses and thus be able to design and implement courses that are challenging but beneficial to students.

Discoverability allows students to find relevant information in the archive. Users should be able to learn about the range of topics and opportunities they could have within our department. The archive is meant to help students see and understand the types of work they are capable of. This allows students to find both the positives and negatives of each individual student's experience with certain projects and companies. The archive allows faculty to see recommendations for the department at a glance. Having easy access to these recommendations means the department can accommodate future students' needs as well as update the program accordingly to the ever-changing TPC industry.

Searchability looks at how easily students can skim through the information within our archive. Currently, our collection of projects is only skimmable by title and student at most. The archive will serve as a platform to allow students to browse more easily by refining their search. It's important that information is skimmable so students don't become stressed or lose motivation while doing their own research.

Limitations, Challenges, and Opportunities

Building this digital archive came with its share of challenges and limitations due to the size of the project. As a student-driven project, both in terms of research and platform development, the project must be ready to pass to new hands as the team graduates. While this was a challenge it opened the door to learning opportunities for students and faculty involved. It helped students create the proper documentation and prototypes to have the project effectively passed down year after year, skills that are especially important for students to develop.

The archive also generated major opportunities for collaboration not just within the TPC major but across programs, which helps to show our administration that there is high value to this project. Our current archive platform was designed by a team of senior students in the computer science department, allowing us to help stretch this project beyond just our department's needs.

This project encourages reflection and discussion of our department's potential need for new classes and teaching material. Since the archive will need to be monitored to track our success or failure, students and faculty will need the skills to understand content management, SEO, and analytics. With analytic tracking, we will be able to see the overall traffic flow going to the archive. Currently, we know the physical projects in the lab are seldom used, so within the first year of the archive being launched any major increase in viewership could be viewed as a success. Additionally, we will consider it a success if the platform continues to offer students opportunities to engage in development, content management, and design work. As a program, we also look forward to the possibilities the archive brings for programmatic assessment as we will have an established data set for analysis.

The current stage is our prototype and, as we refine the design, we hope to strategically expand the variety of topics, courses, and projects represented in the archive. We believe that a well-constructed collection of locally developed projects will provide substantial value for students and faculty as our program continues to prepare students in an ever-changing field of study and practice. These extra materials are invaluable resources for students, allowing them access to old student work to build a complex understanding of the projects they are assigned; however, it is only valuable in the event students are able to readily access it. While we are starting with a single course and group of projects, as it has the most immediate need, providing students with past work examples from all courses from the TPC department would allow access for students to further their learning experience and also set the bar for standards within the department. This part of development won't happen immediately; however, it is being taken into consideration as we build the archival metadata as well as the general archive interface.

As the development of our archive continues, we hope to improve the value of this department resource. Though the creation of a project this size presents challenges, there is evidence that archives encourage learning. Student archives extend student project potential beyond the classroom and put these projects into the hands of future readers. They provide students early ideas of what students need in their education year-to-year. The archive builds a setting outside of the typical classroom for projects to live and is where we will be able to find student improvement and development.

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