CollectionBuilder: A Digital Exhibit Platform and Static Web Development Model for Libraries, Built by Librarians

Abstract

The University of Idaho Library seeks the support of a National Digital Infrastructures and Initiatives Planning Grant in the amount of $99,873 to refine, test, and promote CollectionBuilder, a lightweight, flexible tool for creating digital collection and exhibit websites driven by metadata, and powered by modern static web technology.

CollectionBuilder programmatically generates polished and engaging websites from spreadsheets of collection metadata, creating interactive visualizations for users to discover content and understand context—from maps and timelines to data downloads. Unlike currently available platforms, CollectionBuilder is uniquely focused on providing information professionals with the mechanisms and support needed to independently create digital collections and exhibits without highly specialized IT systems or expertise. The project is guided by the values of GLAM institutions, and pragmatically designed to lower barriers to development, deployment, and participation in digital initiatives.

The project team will use the IMLS grant over the course of one year to 1) refine and expand the development of CollectionBuilder, focusing particularly on optimizing the code base and developing workshops, documentation, online tutorials, and other content to facilitate the tool's use; 2) build a community of collaborators and advisors to test CollectionBuilder and contribute to its refinement; and 3) map the creation of future web publishing tools that situate libraries and information professionals at the forefront of their development and implementation.

At its core, CollectionBuilder leverages librarians' specialized skills in metadata creation and subject analysis to create web publications, shifting the focus from click-on buttons and forms to creating high quality structured data. Following a "collections as data" model, the tool processes collection data, exposes it in reusable formats, and consumes it to generate accessible user interfaces and interactive discovery methods. Powered by modern static-web technologies and deployed on minimal infrastructure, CollectionBuilder uses Jekyll and a "JAM" stack approach to build complete websites from three basic components: a spreadsheet with well-formed metadata, a directory of digital objects, and a configuration file. This data-driven, minimal computing-based approach offers secure and sustainable solutions for libraries and cultural institutions that lack the resources, time, and expertise required to implement commercially marketed library platforms for digital collections and related web publications.

To make this tool as widely accessible and usable as possible , we intend to collaborate with 3-4 institutions, including one that serves diverse communities, during the grant period. These institutions will receive a stipend from the grant in return for installing and using the tool and allowing us to visit the institution in-person to assist and observe their usage. We have also assembled an advisory board whose members have a broad range of experience in developing digital library management systems. This community of advisors and contributors will ensure that we produce the best product and documentation for future users.

The workflows developed by the CollectionBuilder project will become the foundation of a more ambitious initiative called Lib-STATIC, which we envision as a distinctive methodology for developing static web tools that, like CollectionBuilder, are built for and by librarians and information professionals. By refining the suite's first tool and building a community of collaborators around the open-source project, we will establish a model for developing and implementing similar "Lib-STATIC" solutions, while creating a network of contributors that will help advance and sustain the tools and project in the future.

CollectionBuilder: A Digital Exhibit Platform and Static Web Development Model for Libraries, Built by Librarians

Introduction

The University of Idaho Library seeks the support of a National Digital Infrastructures and Initiatives Planning Grant in the amount of $99,873 to refine, test, and promote CollectionBuilder. As a digital exhibit platform, CollectionBuilder utilizes static web technology and structured metadata to programmatically generate websites for visualizing, browsing, and accessing digital collections. The project team will use the IMLS grant over the course of one year to 1) refine and expand the development of CollectionBuilder, focusing particularly on creating workshops, documentation, online tutorials, FAQs and other content to facilitate its use; 2) build a community of collaborators and advisors to implement, test, and contribute to CollectionBuilder's refinement; and 3) map the creation of future web publishing tools that situate libraries and information professionals at the forefront of their development and implementation.

In advancing CollectionBuilder over the course of a concentrated year, our goal is to establish a model for developing, promoting, documenting, and implementing similar tools that follow our nascent Lib-STATIC methodology for creating library technology products. This methodology includes four general principles (outlined in the "Lib-STATIC, a Methodology" section) that when put into practice, ensure that library technology products are built *for* and *by* librarians, libraries, and cultural institutions, and emphasize their needs, skills, and values. CollectionBuilder is the first product in what we envision to be a suite of tools informed by the Lib-STATIC approach; these tools will use modern static web technology and development styles to create lightweight, open source alternatives that can replace the bloated and often proprietary systems that are currently in-use across these fields.

We are well-situated to pursue this project at the scale proposed for two main reasons. First, we have actively developed our digital collections, digital scholarship projects, scholarly research, teaching strategies, and our library's website using static web technologies for several years. Secondly, our library is precisely the type of institution that Lib-STATIC tools are intended to assist.[1] Although we have dedicated and capable library staff and faculty, our core values as well as our lack of time, IT staff, and funding make future investments in large web systems or vendors increasingly problematic; too often, these systems and vendors commandeer excessive amounts of time and money while refusing to provide institutions with sufficient control over these tools/products.

CollectionBuilder itself (technical makeup and development status)

Before detailing the national need, project design, and trajectory for CollectionBuilder, a brief description of its technical context and intended development is necessary. CollectionBuilder uses the static site generator Jekyll to create a series of web pages—home, browse, map, timeline, subject cloud, data, and about—driven by a spreadsheet of collection metadata and simple configuration files. Metadata can be created using a tool, such as Google Sheets, or exported from existing repositories, such as CONTENTdm. The configuration files then expose the basic options for users to adjust the site's pages and visualizations. Following the concept of "convention over configuration," the user can build the default website by simply matching the example template. Thus, a first-time user need only provide well-formed metadata via the CSV file to generate a fully functional site. Then, if that user prefers, he or she can easily engage with the configuration files to learn basic customization options and debug metadata issues.

CollectionBuilder is built on top of a "stack" of popular, mature, and well-documented web development tools including Bootstrap front-end framework and JavaScript libraries such as jQuery and Leaflet, but aims to keep dependencies simple and easy to manage. The project consists of a template of modular HTML, SASS, JavaScript, and

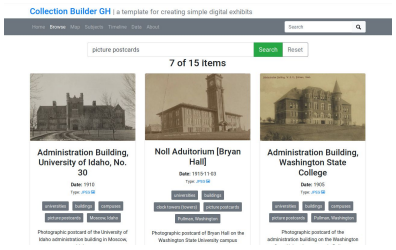
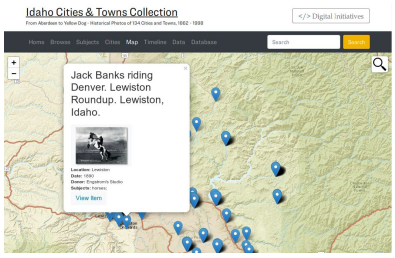
[1] Two of our advisory board members at Washington State University concur: "The proposed CollectionBuilder tool is born from the wealth of experience that Becker and his team at the UI libraries bring to the challenge...In other words, this is a grassroots effort--one designed from expressed needs and built from hands on experience in academic digital scholarship" (see Supportingdoc3.pdf - Appendix C).

Ruby components which are knit together by Jekyll to generate a complete static site (i.e. a folder of HTML, CSS, JSON, and JavaScript files). This plain text source code is easily version controlled with Git, enabling collaboration and project management on cloud platforms such as GitHub, GitLab, or BitBucket. Jekyll provides a local development server that simplifies iterative testing (and learning) and eliminates the need for a test server. For public deployment, the output of static site assets can be copied onto a basic web server (requiring no server-side processing or database), or it can be served directly by free services such as GitHub Pages or GitLab Pages, which provide automatic Jekyll build and hosting.

We currently have two working versions of CollectionBuilder that we use in our local context:

1) **CollectionBuilder for GitHub Pages:** Designed for classroom learning experiences, this stand-alone version can accommodate small collections and be hosted on the free GitHub Pages service without installing any software locally. The user creates metadata and populates an "objects" folder with the digital content files (JPGs, PDFs, MP4s, or MP3s). The documentation scaffolds learning, gradually introducing digital library, web development, and data skills to users while walking them through creating and customizing the site. The simplicity and accessibility of this version is especially useful for teaching the concepts of digital libraries to students and digital humanities practitioners. Our working version can be found here: https://github.com/CollectionBuilder/collectionbuilder-gh

2) **CollectionBuilder Skin**: The "skin" version is similar to the first in its design and function, but connects to an existing digital collection management system, such as CONTENTdm, that hosts the objects. Using the existing system's API, this version populates the website media by calling the content (PDFs, JPGs, MP3s, etc.) already stored in the system. A working version using this model with our own hosted CONTENTdm instance can be found here: https://github.com/uidaholib/collectionbuilder-cdm-template

		
CollectionBuilder-GH browse page	Map page of Idaho Cities & Towns	HJCCC created with graduate researcher

[See Supportingdoc1.pdf - Appendix A for a walkthrough of current CollectionBuilder projects]

This grant will allow us to expand beyond these localized versions of CollectionBuilder by incorporating the unique perspectives of our collaborators, better documenting the necessary workflows, and providing an influx of attention and skills to the project. This will carry us through the piloting phase of development, producing a refined and user-tested product that can be adopted by others. Ultimately, this will result in a third version of CollectionBuilder that provides a viable fully-featured solution with streamlined self-hosted deployment options, capable of replacing existing repository platforms, while still reducing the overhead and technical requirements needed to host and maintain the system.[2]

[2] As our advisory board member from Reed College shares, "we want to develop exhibits with our stakeholders, but lack good options for implementation...In the end, we simply haven't made any digital exhibits due to the lack of [an] appropriate and sustainable system" (see Supportingdoc3.pdf - Appendix C).

Statement of National Need

For well over a decade, **the technical needs of small and medium academic libraries and similar cultural institutions as well as the capacities and expertise of librarians and similar information professionals have been consistently ignored in the development of library web platforms.** While librarians are extensively skilled in areas related to the description, classification, assessment, and publication of information, they often lack the time and specialized technical knowledge needed to implement and maintain complex server infrastructures. Yet overly complicated and technically bloated systems that exacerbate these challenges are seen as a requirement to create and manage digital collections and related platforms, such as institutional repositories, digital humanities projects, and research guides. For the majority of use cases, these complex platforms are overloaded with features that do not meet the needs of libraries, librarians, or users, and introduce unnecessary risks to security and privacy that do not reflect our institutional values and commitments.[3]

System developers' disregard for these discrepancies often results in one of three outcomes: 1) the systems require such extensive staff time and specialized technical knowledge that they are all but impossible for libraries to implement; 2) libraries that do implement them must dedicate a full-time staff or faculty member to their maintenance in order to avoid deterioration and security risks; or 3) libraries pay a third party to run or host the systems and enter into complicated and often unforeseen relationships (e.g. bepress/Elsevier). However, these outcomes need no longer be the default for libraries and other cultural institutions.

CollectionBuilder, a librarian-focused toolkit for creating digital collection and exhibit websites, is our challenge to this status quo. By giving libraries and information professionals total control over every aspect of the system and leveraging their specialized expertise to efficiently meet library and patron needs, CollectionBuilder changes the conversation by centering the needs of these types of institutions and actually addressing one of the nationally significant challenges they face. By doing this, the refinement of CollectionBuilder mirrors many other projects supported by the IMLS National Digital Platform with its "principle-drive framework;"[4] both the work needed to design, implement, refine, and maintain CollectionBuilder as well as the ways in which end-users interact with this product reflects core values of libraries and other cultural institutions.

The challenges of providing web platforms for libraries and cultural institutions with differing technical capacities and collection needs has been prevalent in this community for years and we recognize that CollectionBuilder is not the first platform seeking IMLS support to address this challenge. The Hydra-in-a-Box project, which IMLS supported with $2 million in funds, was a direct response to this issue, as the "box" portion of this project aimed to fulfill the needs of a variety of institutions with varying technical capacities. However, Hydra-in-a-Box and now Hyku were not the first responses to the problem. In some capacity, the Hydra Project emerged from several smaller libraries "breaking-up" with OCLC's CONTENTdm product, which is the dominant digital collection management software system used by academic libraries and similar cultural institutions across the United States. The most notable of these break-ups was detailed by the librarians who managed the Lowcountry Digital Library (LCDL) at the College of Charleston. As was likely the case with many digital librarians who read their

[3] Our concerns are similar to those identified as characteristic of the traditional scholarly publishing ecosystem and infrastructure [Micah Altman and Chris Bourg. "A Grand Challenges-Based Research Agenda for Scholarly Communication and Information Science: Final Report from the MIT Grand Challenges Summit," *MIT Grand Challenge PubPub Participation Platform*, 5, https://doi.org/10.21428/62b3421f.].

[4] Trevor Owens et al., "Digital Infrastructures that Embody Library Principles: The IMLS National Digital Platform as a Framework for Digital Library Tools and Services,"in *Applying Library Values to Emerging Technology: Tips and Techniques for Advancing within Your Mission*, eds. Peter D. Fernandez and Kelly Tilton (Chicago: American Library Association, 2018), 74, https://digitalcommons.unl.edu/scholcom/72.

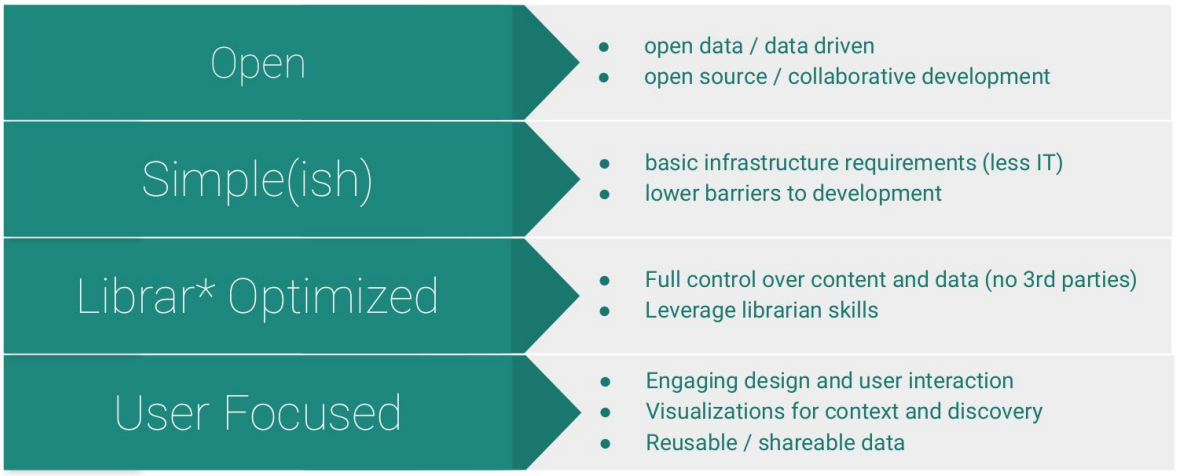
2013 article,[5] which detailed how they moved off CONTENTdm and structured their newly developed digital library,[6] we were envious.

Although we also wanted to break up with CONTENTdm (and still do), we did not possess the technical capacity to set up the various server environments and other software that would enable the type of migration described by the College of Charleston librarians. To break up with CONTENTdm, we needed a low cost, low barrier, and lightweight system that reflected our own context. We were, and are, not alone in these needs either; the letters supporting this project also demonstrate that other libraries and cultural institutions desire this type of system (see Supportingdoc3.pdf - Appendix C and Supportingdoc4.pdf - Appendix D). Our own presentations on static web projects and CollectionBuilder at DLF Forums in 2016 and 2018 as well as conversations with DLF Forum attendees have also demonstrated this need; those who work with digital collections often expressed dismay at the cost and flaws of many current digital collection management systems (mostly available for purchase), as well as their desire for systems that were simple to use, access, and customize without a dedicated team of Ruby developers (much like CollectionBuilder!).

Our enthusiasm for this project is thus driven in great part from our desire to assist librarians and information professionals like us who have dealt with under-designed and overloaded digital library systems for years. While we do not think the initial planning phase supported by this grant will result in a means for libraries and cultural institutions to totally abandon their current systems, this may be a possibility in the future. We see this planning grant as a first step in a much larger process that can alter the practices of digital librarians on a large scale.

Lib-STATIC, a Methodology

As we faced our challenges and frustrations with the systems we used daily, we started to see that there were ways to build these systems and tools that did not lock us into proprietary contracts nor lock us out of the code and data driving the site's presentation. We have begun to realize through developing websites and applications using static web technology over the past several years that we are not just building a series of tools that facilitate our own work and collections. We are also devising a platform development methodology, that we've since named Lib-STATIC. The philosophy behind this development methodology, detailed in the chart below, is a direct response and challenge to the traditional development of library products.



Lib-STATIC emphasises four principles or models for the systems and tools developed, namely that they are: 1) Open,

[5] Heather Gilbert and Tyler Mobley, "Breaking Up with CONTENTdm: Why and How One Institution Took the Leap to Open Source," *Code4Lib*, no. 20, https://journal.code4lib.org/articles/8327.

[6] This structure seems to have influenced the eventual vision of Hyku, which became the final deliverable from the Hydra-in-a-Box project. Hyku intends to be a polished version of Hyrax/Samvera that can be managed by hosting providers such as HykuDirect. Although original goals included an "easy to install and easy to maintain" application accessible by those without a Ruby development team, Hyku seemed to refocus on an multi-tenant, cloud ready system that would be managed by providers. HykuDirect is in beta testing and has yet to open publically, https://duraspace.org/hykudirect/.

2) Simple(ish), 3) Librar* Optimized,[7] and 4) User-Focused. This development structure leverages the expertise of librarians and cultural heritage workers and the uniqueness of the collections they steward to build tools and platforms that are usable and useful to both those that implement them and those that use them. This methodology differs greatly from the predominant model for platform and tool building for academic libraries as it does not require complex infrastructure or specialized developers to build, implement, and maintain the systems put into use. The shift towards a focus on clean data and simple systems enables a more agile and responsive approach, allowing the iterative development of features, gradual acquisition of developer skills, and flexible migration between hosts without the need for deep investment. We recognize that there will still be learning curves and frustrations in the development and use of any system, regardless of its underlying methodology. However, with its focus on the primary values of usability and accessibility, Lib-STATIC gives libraries and cultural institutions the framework within which to develop and use tools that actually embody their principles by removing the overwrought features and extensive infrastructure requirements that permeate many of the library systems currently used and developed. Consequently, by embodying library principles in the development of a technical platform, we believe that CollectionBuilder and Lib-STATIC address the IMLS National Digital Infrastructures and Initiatives project requirements.

Project Design

Our goal for this project is to refine and expand CollectionBuilder into a user-friendly digital collection exhibit builder via user- and production-testing at 3-4 collaborating institutions. We infer that, like us, many institutions desire lightweight means for creating well-designed digital collection sites that enable the easy discovery of, and exposure to, unique materials and data.[8] Our audience is thus twofold as we will target and recruit: cultural institutions of all sizes that desire a lightweight option for providing access to digital collections and exhibits, and digital humanities practitioners who want to teach digital library and web development skills without needing their own server and web domain to do so.

Our main risk is that we end up in the same situation as many well-intentioned developers in the past, setting up systems where our users feel just as lost and cut off from their data as they do now. To alleviate this risk, we will spend a substantial amount of time and funding on the development of documentation, tutorials, and guidance for new CollectionBuilder installations. This will include the creation of clear workflow and deployment options that will be viable for a range of organizations and contexts. We also recognize that documentation alone is only one piece of the puzzle. To ensure that installers have the necessary point-of-need support, we will also commit to serving as troubleshooters and problem-fixers for CollectionBuilder issues for three-years, post award (see Supportingdoc4.pdf - Appendix D for a letter from our Dean, Ben Hunter, detailing the administrative backing for this promise).[9]

As detailed in the "CollectionBuilder itself" section, we have two slightly different working prototypes for CollectionBuilder. Both the stand-alone and skin version derive a digital collection exhibit site—featuring visualizations and interactive browsing features, such as maps, timelines, and tag clouds—from a spreadsheet with standards-based metadata provided by the user.[10] After developing this prototype, we believe this approach holds great promise for a variety of web publishing platforms currently used by libraries and similar organizations, including and in addition to those connected to digital collections. As such, we intend to use IMLS funds to further **refine/expand**

[7] Being library nerds, we are inordinately proud of this use of the wildcard in our principles.

[8] As our unofficial collaborator, the Latah County Historical Society, indicates, a lightweight solution for discovery of historical material is desired not only because of its low cost, but also because it has the potential to save valuable staff time: "Research requests arrive in our office on an almost daily basis, and if we could present an outward facing catalogue, a number of those inquiries could be answered through a simple search on the part of the researcher, thus saving our staff time" (see Supportingdoc4.pdf - Appendix D).

[9] Our development of documentation and our three-year post award service role reflects a commitment to supporting the continued maintenance work that is often made invisible in libraries and archives [Hillel Arnold, "Critical Work: Archivists as Maintainers," last modified August 2, 2016, https://hillelarnold.com/blog/2016/08/critical-work/].

[10] An example: our timeline visualization sorts all collection items by date and then displays item thumbnails down the page in shaded groupings based on year or era.

CollectionBuilder itself; **build communities** of users, collaborators, and advisors around the tool's development; and **map future** possibilities for similarly developed projects to be included in the Lib-STATIC suite.

The following sections discuss our work plan and associated tasks. A condensed work plan is included below and the 'Scheduleofcompletion.pdf' document contains the expanded work plan.

Tasks *Months*	Pre	1	2	3	4	5	6	7	8	9	10	11	12
Refine CollectionBuilder prototype and documentation													
Hire developer and graduate student assistant													
Build support and recruit Advisory Board													
Recruit institutional collaborators													
Implement/test tool at each collaborator's site													
Seek and incorporate feedback from the community													
Promote project and its progress via listservs, conferences, workshops, and other venues													
Develop roadmap for development of CollectionBuilder and other Lib-STATIC products													

Refine/Expand

Refine CollectionBuilder prototype and documentation

Our working versions for this product are adequate for internal use, but their presentation, design, code, and documentation can be significantly improved. Grant team members have worked on CollectionBuilder developments in their spare moments over the past year, and with the support provided by this grant, each team member would be able to dedicate concentrated time to this project (4% for the year) as well as leverage additional assistance and expertise as we work to improve this product. Each team member will have a defined role throughout the project. Becker will serve as the overall project director, ensuring that the correct funds are administered, applications and reports are filed, and grant personnel are effectively managed. Williamson will direct all technical aspects of the project, including overseeing the work of the developer/consultant. Doney will direct the development of documentation, developing plans for the creation and delivery of the materials and overseeing the work of our graduate student assistant. Finally, Wikle will direct communication and the assessment of this project, working with our collaborators and advisors to ensure that they understand the implementation process and gathering formal and informal feedback from all involved.

Hire developer/consultant and graduate student assistant

By the end of the first month of the grant period, we will hire two people to work on this project: a web developer/computer programming consultant who will assist with the technical aspects of the project, and a graduate student assistant who will assist with documentation and grant administration. Anticipated tasks for these individuals

are detailed below and the complete position descriptions are available in the 'Resumes.pdf' document:

1) **Developer/Consultant**: The individual hired for this role will be a JavaScript and/or Ruby developer who can improve CollectionBuilder's code base, develop new features, and provide expert advice on workflow management. This developer/consultant will focus on optimizing existing code and providing new solutions for desired features, such as improved search features within collections and across multiple collections, non-Google-based analytics, and project automation pipelines. We will leverage their expertise to create and document viable options for deployment and long-term management of a CollectionBuilder-based project and its media assets on easily accessible service providers such as Amazon Web Services. These deployment strategies will be developed in response to the needs of our collaborators and will reflect a range of realistic infrastructure challenges and opportunities. In order to recruit for this role, we have identified potential developers who might assist us, and distributed an RFP (see Supportingdoc5.pdf - Appendix E) to various development firms. $16,335, which includes the salary and the associated fringe (8.9% for temporary help), will be earmarked to fund this position.

2) **Graduate Student Assistant (part-time):** This individual will work 16 hours per week for the duration of the grant ($18/hr) and assist with the documentation of the tool as well as the administration of the grant. We know from experience that creating comprehensive documentation takes a great deal of time and that the best documentation is often created when developers work with those who have just recently learned to use the tool themselves. As such, this individual will leverage their new knowledge to produce various forms of documentation that will assist others with the implementation and customization of CollectionBuilder, including, but not limited to, instructions, tutorials, and online recordings. This individual will also assist with the administration of the grant, particularly in regards to the travel and promotional tasks. We believe this position will be a desirable opportunity for a graduate student in our area who wants to develop new expertise in digital humanities and library fields as well as engage in impactful work. $15,820, which includes the salary and the associated fringe (3.4% for a student), will be earmarked to fund this position.

Build Communities

Build support and recruit Advisory Board

Our Advisory Board, which consists of five individuals, will provide us with feedback and direction throughout the project via informal communications, 1-2 formal calls during the grant period to assess our progress, and a written assessment at the grant period's conclusion. Members come from a variety of academic institutions, including Columbia University, Washington State University (WSU), and Reed College. Each member has actively developed digital library tools and systems for years, including Mukurtu, Wax, and the Reed Digital Collections (which uses a system they developed in-house[11]). Each of the advisory board members offers specific skills and experiences that we will draw upon, and several of the members are also developing complementary projects that may connect to ours. We, as well as our advisory board members, recognize that a one-size-fits all approach to product development is not feasible. Working with advisors who have complementary projects and frameworks helps all of us advance the knowledge ecosystem and develop products that are accessible and useful for a variety of contexts.[12] Additional details about our advisory board members are included in a supporting document (see Supportingdoc2.pdf - Appendix B) as well as outlined within the letters of support each wrote for the project (see Supportingdoc3.pdf - Appendix C).

[11] According to our advisory board member from Reed College, their decision to develop and use an in-house system was influenced by the current product landscape: "Most products were too complicated and required too much developer time, for mediocre outputs at best. A homegrown system allowed for flexibility and for us to focus on our users" (see Supportingdoc3.pdf - Appendix C).

[12] Our advisory board members from Columbia University envision that these "compl[e]mentary workflows that rely on static site generation will overcome several major costs and impasses of the past: maintenance, security, environmental impact, access in low-bandwidth and low-internet areas, overall sustainability and more" (see Supportingdoc3.pdf - Appendix C).

Recruit institutional collaborators

During the first several months of this grant period, we will focus on identifying and recruiting representatives from four libraries and/or other cultural institutions to serve as institutional collaborators. We have two collaborators already committed, the Latah County Historical Society (Moscow, ID) and Lane Community College (Eugene, OR) (see Supportingdoc4.pdf - Appendix D for their letters of support). The Latah County Historical Society has agreed to serve in an 'unofficial' capacity during the grant period; given that we regularly collaborate with this institution, we want to ensure that our official collaborators represent other unique perspectives for the tool's development. Our other initial collaborator, Lane Community College, already envisions how CollectionBuilder could be impactful; at a small institution like Lane, CollectionBuilder "can make digitization and metadata projects attainable" as well as offer new opportunities for the Library to integrate digital learning objects and digital collection building into the curriculum. To attract other collaborators, the project team will advertise this opportunity on various listservs and target specific institutions that we believe would be promising candidates. The institutions selected as collaborators will reflect a variety of types and sizes. These will include at least one institution that serves underrepresented communities (see the "Diversity Plan" section for more details) and could also include single-archivist historical societies, public universities our size or slightly larger, community colleges, and/or liberal arts colleges. Our goal is to recruit those institutions that would specifically benefit from this type of tool,[13] and we intend to take our time doing so, as we believe that finding the right collaborators is crucial to refining and expanding the tool.

We are also cognizant of the often forgotten 'time costs' that are required to implement, test, and maintain any tool.[14] As such, each of the institutions with whom we collaborate will be provided with a stipend of $1500 to help offset costs associated with their involvement in this project. We believe that this incentive and our three-year post award service role, together with the promise of CollectionBuilder's applicability for a wide variety of digital collections and the potential for our collaborators to build fundamental web skills as they work with CollectionBuilder, will make this an attractive opportunity for a variety of institutions.

Implement and test tool at each collaborator's site

Once these institutional collaborators are identified, recruited, and committed to the project, the project team will work remotely with each collaborator to begin the process of identifying and implementing CollectionBuilder pilot projects for each institution's materials. During this process, we will learn more about where they are as an institution, target viable CollectionBuilder projects, and identify how we might best assist them in their development goals. We recognize that each collaborator will have unique contexts as well as distinct needs for their pilot projects and digital library content; these factors will be our central focus as we implement and test CollectionBuilder. Once the project team and institutional collaborators both feel comfortable with our progress, one of the grant team members will visit the institution for a 2-3 day in-person sprint to set-up an optimal development environment for the users, provide assistance with workflow development, and help customize the tool to the institution's needs. We believe this intensive period of in-person collaboration will be extremely time effective, allowing team members to discover challenges, model debugging processes, and seek feedback from the collaborators. Team members will then use these experiences and the unique feedback shared by each institution to further refine CollectionBuilder features and documentation as well as its future roadmap.

Seek and incorporate feedback from community

The latter portion of the grant will be spent fine-tuning the tool's setup, design, and documentation by incorporating

[13] Our advisory board members from Washington State University see our goal of recruiting diverse collaborators as accurately reflecting CollectionBuilder's target users as this product "would fill a much-needed use case for smaller, underserved, and marginalized communities, libraries, archives and researchers" (see Supportingdoc3.pdf - Appendix C).

[14] In essence, the difference between things that are unconditionally free ("free food") and those that are conditionally free ("free puppies") because of the costs associated with keeping something 'alive' [Marty Gengenbach et al., "OSS4EVA: Using Open-Source Tools to Fulfill Digital Preservation Requirements," *Code4Lib*, no. 34, http://journal.code4lib.org/articles/11940.].

the feedback shared by our collaborators throughout the process, including during site visits, as well as the formal feedback from our Advisory Board. During this process, we hope to empower the collaborators and advisors to claim portions of the tool as their own, make their own unique contributions, and hopefully promote the tool to others.[15]

Promote project and its progress via listservs, conferences, workshops, and other venues

Throughout this project, the project team will also promote CollectionBuilder and the work made possible by this grant. If awarded, we intend to report on the tool and its progress at a variety of conferences, including, but not limited to, the Digital Library Federation Forum, Code4Lib, Online Northwest, Coalition of Networked Information, Digital Humanities, as well as at regional conferences, such as those hosted by the Pacific Northwest Library Association and the Idaho Library Association. If time and funding allows, we are also willing to co-present with our collaborators and support their own presentations on CollectionBuilder at other state or regional conferences.

Map Future

Develop roadmap for development of CollectionBuilder & other Lib-STATIC products

CollectionBuilder is our first step in creating a suite of tools that reflect our Lib-STATIC methodology. We have already set the stage for CollectionBuilder's continued development by using a localized version of the tool to rebuild the front-ends for our CONTENTdm collections and leveraging CollectionBuilder as a teaching tool in the classroom (see Supportingdoc4.pdf - Appendix D for examples of how CollectionBuilder has been used as a pedagogical tool in University of Idaho courses). In addition to CollectionBuilder, the project team has also started to develop another specialized tool that embodies the Lib-STATIC methodology. This tool, called the Oral History as Data module, allows users with qualitative interviews or oral histories to visualize, browse, and search simply formatted and coded transcripts via a static website. Although we've seen how CollectionBuilder and a module like Oral History as Data can be used in our own institutional context, we're missing two key parts of the puzzle: 1) the documentation that would allow others to install and use these products, and 2) the unique perspectives, contexts, and needs that would inform the development of future Lib-STATIC products. We see our developers, collaborators, advisors, and the community-at-large as key players who can help us 'solve' this puzzle. With their collaboration, support, and feedback over the course of this grant period, we will be able to develop documentation that encourages others to use and adopt CollectionBuilder; create a model for building and promoting similar static web tools for librarians; and foster a Lib-STATIC community that empowers libraries and cultural institutions to select, use, and build systems that reflect their distinct values.

Diversity Plan

To ensure that CollectionBuilder meets the needs of diverse constituents and that we, as developers, incorporate perspectives that differ from our own into its design, we will select at least one institutional collaborator that is dedicated to the service of diverse and underrepresented communities. We believe that including those that have and support unique voices and needs in the implementation, testing, and refinement of CollectionBuilder is an ethical necessity.[16] If CollectionBuilder is to truly embody the Lib-STATIC methodology, we must seek out and listen to those voices that are different than our own as we work to refine this tool. Too often, we have seen how the inclusion of diverse organizations within projects is viewed as a box-to-be-checked and work is done *for* or *to* an organization, instead of *with* an organization. In working with this organization, and all of our collaborators, we recognize the need

[15] Gengenbach et al, "OSS3EVA;" see for more detail about how collaborative participation in the development of an open-source tool can lead to greater commitment and support.

[16] Altman and Bourg, "A Grand-Challenges Based Research Agenda;" recently efforts to shift the research and scholarly ecosystem towards openness and sustainability also recognize that all aspects of a project need to include individuals who belong to and serve diverse communities.

to truly collaborate and remove our own assumptions from the equation by ensuring that their unique perspectives and contexts guide our work. We also see the need for our collaborators to reflect diverse institutional contexts. Although we see CollectionBuilder as useful for various types of institutions, we recognize that, for example, a single-archivist historical society will have different needs and challenges than a community college. Therefore, we will strategically recruit collaborators from a variety of institutional contexts to ensure that our refinement and expansion of CollectionBuilder results in a product that is flexible and adaptable.

National Impact

Our refinement and expansion of CollectionBuilder and our development of future Lib-STATIC products have the potential to impact a large swath of libraries and cultural institutions, librarians and information professionals, as well as patrons and stakeholders.[17] As an open-source project, CollectionBuilder embodies the Lib-STATIC approach by providing libraries and cultural institutions of all sizes with true ownership of, and agency in, their web platforms. As a result, they will be able to use CollectionBuilder immediately, participate in its continued development, and build new iterations that meet their specialized needs. With CollectionBuilder, these institutions will no longer be asked to neglect their core values and unique voices.

We also see that the financial and technical barriers described earlier in this document are not unique to digital collection/exhibit tools, they also exist across the profession within institutional repository platforms and research guide managers, such as LibGuides.[18] These overly complex systems cannot stay up-to-date with best practices in software, data, patron privacy, open access, and design, and yet libraries spend many millions of dollars combined for the privilege of using them.[19] For those libraries and other cultural institutions that want more control of their data, content, and interactive designs, we maintain that the Lib-STATIC methodology and its minimal infrastructure strategy is an accessible alternative.[20]

We believe this project is currently in the piloting phase in that we are trying to see "how many ways" (and with how many different users) this first Lib-STATIC product might be successful. As such we hope to use this grant to answer several of the questions posed in this phase: "Can [our] project be successful when made with different ingredients or in different proportions? Just how precisely do adopters of [our] project plan need to follow [our] recipe? What type of instructions will they need?"[21]

Our visions for these projects are just visions for now, but with concentrated time to develop and expand CollectionBuilder, along with the community of users and collaborators we intend to build, we can start to map out new products and processes for further development of Lib-STATIC tools. In other words, and to use the IMLS phases specifically, we intend to use this grant to move out of our current Piloting phase into the Scaling phase, with some time spent imagining how this project might eventually be mainstreamed. At grant's end, we will have developed a well-tested, easy-to-use digital exhibit builder; built a community of users and contributors invested in the CollectionBuilder tool (and our development model); and created a roadmap for future development of other static web (Lib-STATIC) tools.

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[17] In a letter of support, our advisory board member at Reed College stated: "We have been contacted by many institutions of similar size who are also frustrated with the lack of options...Most don't have the resources to support a full-fledged development program...There is clearly a need for a simple, lightweight, and flexible tool" (see Supportingdoc3.pdf - Appendix C).

[18] Owens et al., "Digital Infrastructures," 75; lack of librar* involvement in the creation of these systems leads to platforms that 'work' to some extent, but these platforms often reflect the values of their creators (commercial or otherwise) instead of the core values of librar*.

[19] Altman and Bourg, "A Grand-Challenges Based Research Agenda," 21; these concerns are also apparent in research and publishing, with librar* expressing concern about the commercial dominance of infrastructure and the risks this has for the development of "open, sustainable, and equitable scholarship."

[20] Comparatively, we recognize that the Lib-STATIC methodology and its minimal infrastructure strategy may not be sufficient for projects involving very large or unique data structures.

[21] Kathryn K. Matthew, "Biscuits vs. Granola: Innovative Ways for Libraries, Archives, and Museums to Scale Up," *IMLS* (blog), June 8, 2018, https://www.imls.gov/blog/2018/06/biscuits-vs-granola-innovative-ways-libraries-archives-and-museums-scale.

Schedule of Completion

Tasks	Pre	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Refine/Expand													
Refine CollectionBuilder prototype and documentation													
Hire developer/ consultant and graduate student assistant													
Build Communities													
Build support and recruit Advisory Board													
Recruit institutional collaborators													
Implement and test tool at each collaborator's site													
Seek and incorporate feedback from the community													
Promote project and its progress via listservs, conferences, workshops, and other venues													
Map Future													
Develop roadmap for development of CollectionBuilder and other Lib-STATIC products													

DIGITAL PRODUCT FORM

Introduction

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to federally funded digital products (e.g., digital content, resources, assets, software, and datasets). The products you create with IMLS funding require careful stewardship to protect and enhance their value, and they should be freely and readily available for use and re-use by libraries, archives, museums, and the public. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and practices that could become quickly outdated. Instead, we ask that you answer questions that address specific aspects of creating and managing digital products. Like all components of your IMLS application, your answers will be used by IMLS staff and by expert peer reviewers to evaluate your application, and they will be important in determining whether your project will be funded.

Instructions

All applications must include a Digital Product Form.

☐ Please check here if you have reviewed Parts I, II, III, and IV below and you have determined that your proposal does NOT involve the creation of digital products (i.e., digital content, resources, assets, software, or datasets). You must still submit this Digital Product Form with your proposal even if you check this box, because this Digital Product Form is a Required Document.

If you ARE creating digital products, you must provide answers to the questions in Part I. In addition, you must also complete at least one of the subsequent sections. If you intend to create or collect digital content, resources, or assets, complete Part II. If you intend to develop software, complete Part III. If you intend to create a dataset, complete Part IV.

Part I: Intellectual Property Rights and Permissions

A.1 What will be the intellectual property status of the digital products (content, resources, assets, software, or datasets) you intend to create? Who will hold the copyright(s)? How will you explain property rights and permissions to potential users (for example, by assigning a non-restrictive license such as BSD, GNU, MIT, or Creative Commons to the product)? Explain and justify your licensing selections.

All CollectionBuilder software will be openly licensed under the MIT License, which is included directly in each project's GitHub repository as "LICENSE" file. The MIT License was chosen because: 1. it is one of the simplest open licenses to enable reuse, 2. it is common and well understood, 3. it is used by the majority of dependencies in the CollectionBuilder project, and 4. it is commonly used by our academic peers on static web projects. Dependencies included with the project will retain their own licenses as directed by their owners.
All CollectionBuilder text content and media assets will be licensed Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0). The CC BY-SA license will be stated in the project README and displayed on central web pages (documentation, about). CC BY-SA is commonly used and well understood in library communities. This ensures CollectionBuilder workflow documentation can be easily re-used and adapted by others.
Contributors and dependencies will be acknowledged in the project repository.

A.2 What ownership rights will your organization assert over the new digital products and what conditions will you impose on access and use? Explain and justify any terms of access and conditions of use and detail how you will notify potential users about relevant terms or conditions.

The ownership and terms of use are covered by the project's MIT License, which allows permissive reuse, only requiring preserving the license and copyright notice. This information is contained in the "LICENSE" file included with the source code.

A. 3 If you will create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities, describe the issues and how you plan to address them.

CollectionBuilder software will not collect data from users or send any information back to the project.
As with any web project, institutions who choose to deploy a website built by CollectionBuilder will face decisions involving privacy (in any web analytics packages they add) and cultural sensitivity (in their digital collections content).
The CollectionBuilder template will include a end-user alert to highlight the institution's privacy policy and terms of use.
CollectionBuilder documentation hopes to suggest best practices for these issues, however, the policies and implementation are solely the responsibility of the user.

Part II: Projects Creating or Collecting Digital Content, Resources, or Assets

A. Creating or Collecting New Digital Content, Resources, or Assets

A.1 Describe the digital content, resources, or assets you will create or collect, the quantities of each type, and the format(s) you will use.

Not applicable for this project

A.2 List the equipment, software, and supplies that you will use to create the content, resources, or assets, or the name of the service provider that will perform the work.

Not applicable for this project

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG) you plan to use, along with the relevant information about the appropriate quality standards (e.g., resolution, sampling rate, or pixel dimensions).

Not applicable for this project

B. Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan. How will you monitor and evaluate your workflow and products?

Not applicable for this project

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period of performance. Your plan may address storage systems, shared repositories, technical documentation, migration planning, and commitment of organizational funding for these purposes. Please note: You may charge the federal award before closeout for the costs of publication or sharing of research results if the costs are not incurred during the period of performance of the federal award (see 2 C.F.R. § 200.461).

Not applicable for this project

C. Metadata

C.1 Describe how you will produce any and all technical, descriptive, administrative, or preservation metadata. Specify which standards you will use for the metadata structure (e.g., MARC, Dublin Core, Encoded Archival Description, PBCore, PREMIS) and metadata content (e.g., thesauri).

Not applicable for this project

C.2 Explain your strategy for preserving and maintaining metadata created or collected during and after the award period of performance.

Not applicable for this project

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content, resources, or assets created during your project (e.g., an API [Application Programming Interface], contributions to a digital platform, or other ways you might enable batch queries and retrieval of metadata).

Not applicable for this project

D. Access and Use

D.1 Describe how you will make the digital content, resources, or assets available to the public. Include details such as the delivery strategy (e.g., openly available online, available to specified audiences) and underlying hardware/software platforms and infrastructure (e.g., specific digital repository software or leased services, accessibility via standard web browsers, requirements for special software tools in order to use the content).

Not applicable for this project

D.2 Provide the name(s) and URL(s) (Uniform Resource Locator) for any examples of previous digital content, resources, or assets your organization has created.

Not applicable for this project

Part III. Projects Developing Software

A. General Information

A.1 Describe the software you intend to create, including a summary of the major functions it will perform and the intended primary audience(s) it will serve.

CollectionBuilder is a digital exhibit platform that utilizes structured metadata to programmatically generate websites for visualizing, browsing, and accessing collections. We envision CollectionBuilder being used by libraries and cultural heritage institutions in three main ways: 1) the creation of stand-alone library digital collections and exhibits, 2) the creation of “skins” to apply on top of the data/metadata from current digital collection management systems, and 3) as a pedagogical tool for teaching about digital collection development and the fundamental skills that drive that work, namely metadata creation, data cleaning/visualization, and web development. Since CollectionBuilder lowers development and infrastructure barriers, we believe the audience will be many small and medium institutions that have dedicated and capable library staff and faculty but lack the time, IT staff, and funds to invest in large web systems or vendors.

A.2 List other existing software that wholly or partially performs the same functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

Currently available digital collections platforms rely on heavy infrastructure including server-side processing and database engines. In contrast, CollectionBuilder generates easily customizable static web based sites driven by collection metadata. Thus, CollectionBuilder provides information professionals with the mechanisms and support needed to independently create digital collections and exhibits without specialized IT systems or expertise. This lowers the barriers to adoption and development. The customizable visualizations provide better context and flexibility in representing collections than existing solutions which are mostly database-like.

B. Technical Information

B.1 List the programming languages, platforms, software, or other applications you will use to create your software and explain why you chose them.

CollectionBuilder is built on top of a stack of popular, mature, and well documented web development tools including Bootstrap front-end framework and JavaScript libraries such as jQuery and Leaflet, but aims to keep dependencies simple and easy to manage. The project consists of a template of modular HTML, SASS, JavaScript, and Ruby components which are knit together by Jekyll to generate a complete static site (i.e. a folder of HTML, CSS, JSON, and JavaScript files).

B.2 Describe how the software you intend to create will extend or interoperate with relevant existing software.

CollectionBuilder can be used as a "skin" on top of existing repository / digital collection management platforms, such as CONTENTdm, via APIs. Used in this way, CollectionBuilder provides improved user interfaces and methods for visualizing, browsing, and accessing collections.

B.3 Describe any underlying additional software or system dependencies necessary to run the software you intend to create.

CollectionBuilder projects use popular, mature, and well documented web development tools chosen for their stability and popularity. To build websites locally, users of the full system will need Ruby and Jekyll. Hosting the static websites generated by CollectionBuilder require a minimal web server (no server-side processing or database is required) or managed solution.

B.4 Describe the processes you will use for development, documentation, and for maintaining and updating documentation for users of the software.

CollectionBuilder software and documentation is developed in the open on GitHub using version control and project management features available on the platform.

B.5 Provide the name(s) and URL(s) for examples of any previous software your organization has created.

We currently have two working versions of CollectionBuilder that have been used in our local context:
CollectionBuilder for GitHub Pages, https://github.com/CollectionBuilder/collectionbuilder-gh
CollectionBuilder Skin for UIdaho digital, https://github.com/uidaholib/collectionbuilder-cdm-template

Additional related projects can be found at our GitHub organizations:
https://github.com/CollectionBuilder
https://github.com/uidaholib

C. Access and Use

C.1 We expect applicants seeking federal funds for software to develop and release these products under open-source licenses to maximize access and promote reuse. What ownership rights will your organization assert over the software you intend to create, and what conditions will you impose on its access and use? Identify and explain the license under which you will release source code for the software you develop (e.g., BSD, GNU, or MIT software licenses). Explain and justify any prohibitive terms or conditions of use or access and detail how you will notify potential users about relevant terms and conditions.

All CollectionBuilder software will be openly and permissively licensed under the MIT License, which is included directly in each project's GitHub repository as "LICENSE" file.

C.2 Describe how you will make the software and source code available to the public and/or its intended users.

All CollectionBuilder source code will be openly available on GitHub. Examples of sites built with the project will be available from the documentation.

C.3 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

CollectionBuilder organization

URL:

https://github.com/CollectionBuilder

Part IV: Projects Creating Datasets

A.1 Identify the type of data you plan to collect or generate, and the purpose or intended use to which you expect it to be put. Describe the method(s) you will use and the approximate dates or intervals at which you will collect or generate it.

Not applicable for this project

A.2 Does the proposed data collection or research activity require approval by any internal review panel or institutional review board (IRB)? If so, has the proposed research activity been approved? If not, what is your plan for securing approval?

Not applicable for this project

A.3 Will you collect any personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information? If so, detail the specific steps you will take to protect such information while you prepare the data files for public release (e.g., data anonymization, data suppression PII, or synthetic data).

Not applicable for this project

A.4 If you will collect additional documentation, such as consent agreements, along with the data, describe plans for preserving the documentation and ensuring that its relationship to the collected data is maintained.

Not applicable for this project

A.5 What methods will you use to collect or generate the data? Provide details about any technical requirements or dependencies that would be necessary for understanding, retrieving, displaying, or processing the dataset(s).

Not applicable for this project

A.6 What documentation (e.g., data documentation, codebooks) will you capture or create along with the dataset(s)? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the dataset(s) it describes?

Not applicable for this project

A.7 What is your plan for archiving, managing, and disseminating data after the completion of the award-funded project?

Not applicable for this project

A.8 Identify where you will deposit the dataset(s):

Name of repository:

Not applicable for this project

URL:

Not applicable for this project

A.9 When and how frequently will you review this data management plan? How will the implementation be monitored?

Not applicable for this project