Developing Extensible Methods for Provenance Research

Developing Extensible Methods for Provenance Research is a three-year project (September 2020 – August 2023) led by Dr. Sarah Buchanan at the University of Missouri iSchool. This Early Career Development project proposal requests $295,081 under the LB21 Lifelong Learning category to conduct an empirical investigation, develop an open educational resource (OER), and assess collective impact. The project pursues three research questions: 1) How do practitioners complete provenance research? 2) Which methods best expand public engagement with collections? 3) What learning outcomes would undergraduate provenance researchers experience? In answering these questions, the project will endeavor to reposition provenance work as a space for proactive inclusion in the archival field, and to cultivate the professional development and retention of provenance researchers.

<u>I. STATEMENT OF BROAD NEED</u>. Provenance is a fundamental concept in archival practice, where it is defined as the origin of an item alongside information regarding the item's custody and ownership across time.[1] A key purpose of provenance research is to secure pending donations. Yet provenance research suffers from a problem of anecdotal and incomplete methodology that is incommensurate with the scale of descriptively-unprovenanced archives, requiring transformative development of an extensible toolkit to meet the needs of archivists and those of college-level archive users. Only 33% of a recent sample of EAD finding aids contain the <acqinfo> element[2] and archivists lack protocols for gathering provenance approaching the level of those present for art curators in *The AAM Guide to Provenance Research* (2001), which sets a threshold without articulating inclusive methods. Pilot work by the researcher has guided undergraduate and graduate student contributions of original provenance research about departmental teaching collections and Native collections, respectively: two areas of the breadth and scope of archives to be studied in the project. Still thousands of nonaccessioned materials remain unexamined because archivists lack an extensible protocol that rises to Gerstenblith's view of "due diligence" activity when researching legacy collections and new acquisitions – one meant to ascertain provenance and avert frivolous, forged, or questionable claims of origin.[3] Through defining modular and lifelong learning-oriented (**project category**) skills, the project will create data-informed training and instructional materials to build capacity in the area of provenance research for working professionals – including career-changers new to provenance work, self-directed learners already embedded in the institution, and continuing education seekers. Broad need is asserted by the reach of provenance research into a wide array of cultural heritage institutions concerning the ownership of art and material culture – impacting, e.g., the disposition of hundreds of looted and smuggled masterpieces.[4] Collections, whether they are of a personal, community, corporate, or governmental nature, all bear a physically inconspicuous but intrinsic provenance story, telling where and when the items existed in the world. That story is a determinant of items' fame or renown, value judgments, use frequency, aesthetic appeal, resource investments, and research interest – all of which impact the current possessor's growth within sustainable limits. Provenance often begins as an issue encountered at the item- or collections-level, but after preliminary work, reveals cross-institutional relationships and supranational pathways needing to be charted and laid out in geospatial sequence or chronological time. The Project Director (PD)'s relevant experience with visualizing geolocation metadata using tools such as EAD3 and PeriodO (http://perio.do/contributors/) will inform the creation of educational resources meant to expand capacity to conduct provenance research, innovatively apply the use of digitized catalogs in undergraduate and graduate learning environments, and develop best practices.

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[1] *SAA Glossary of Archival and Records Terminology*, https://www2.archivists.org/glossary/terms/p/provenance.
[2] M. Bron, M. Proffitt, and B. Washburn, "Thresholds for discovery: EAD Tag analysis in ArchiveGrid, and implications for discovery systems," *Code4Lib Journal* 22 (2013): https://journal.code4lib.org/articles/8956.
[3] P. Gerstenblith, "Provenances: Real, fake, and questionable," *International Journal of Cultural Property* 26, no. 3 (2019): 296, doi:10.1017/S0940739119000171.
[4] C. Tsirogiannis, "False closure? Known unknowns in repatriated antiquities cases," *International Journal of Cultural Property* 23, no. 4 (2016): 407-431, doi:10.1017/S094073911600028X.

Core Activity: Provenance Secures Acquisitions. This project will specifically examine the archival acquisitions stage: in particular holdings documentation and tiered methods for accessioning. It is anticipated that findings from the archival domain will be extensible to work in museums, especially since acceptance of a new museum collection very often rests on first securing archival provenance; such convergence will be interrogated in the special collections site visits (RQ1). Pressing need also exists to deepen an emergent and strategic collaboration with undergraduate students already interacting with collections in order to assess whether the outcomes of provenance research remain publicly accessible (RQ2) and generative for learning (RQ3). Information uses of a diverse population of students will thus directly inform the creation of a provenance research instructional toolkit for archivists and users. Our goal is ultimately to expand and diversify provenance research as a uniquely inclusive type of information work – capacity-building for which modular continuing education will play a large role. We acknowledge a dearth of trained full-time provenance researchers due in part to a lack of established, low-cost educational materials meeting the needs of would-be librarians and archivists. For this reason provenance research has nearly become the province of contracted specialists as the skill is not sufficiently addressed by traditional learning providers, contributing to a presently uneven and (static, high-profile) case-based body of practice. This Early Career Development (ECD) project will build the theoretical base for provenance research in service to current library and archival practice by examining how its current practice is informed by professional resources, national regulations, due diligence guidelines, and diverse, qualitative user data to be collected.

<u>Supporting Role of Provenance in Audience Engagement, including Research and Storytelling</u>. Provenance figures centrally in multiple activities by archives, both related to processing and those that interface directly with users. Provenance is a key component of exhibit labels and metadata[5] attached to digital archive platforms, where so many independent learners, students, and professionals first encounter archival institutions (through the holdings). The smudged "Erased de Kooning Drawing" (1953) attracts two to four outside exhibitions each year and is the most widely reproduced work in SFMOMA's collection, solely because of its storied obverse labels.[6] Lack of provenance can severely deter or put a stop to prospective patron or visitor interactions – making its transparent, truthful display critically important. Knowledge of provenance helps scholars reconstruct the history of tastes and social trends, and promotes fruitful exchanges across borders. In reception analysis, the provenance story may attract more attention than the content of the work because of what it reveals about past behaviors. But it often resembles detective work, thus commanding time, expertise, and persistence – which can be tremendously rewarding when long-unanswered mysteries are solved and/or individuals find peace through the research process. The complex, mangled itineraries revealed by provenance research provoke the retelling of stories with "new endings" that restore agency to marginalized peoples.

Provenance Research as a Culturally Responsive Practice. Culturally responsive practice recognizes the importance of negotiating new standards and norms that attend to differences in cultural reference points among the community or audience of learners. Archival and museum educators have realized that when they teach with an eye toward their learners' cultures, their teaching elevates, and learners develop lifelong relationships with archives and museums as sites of learning – perhaps via object-based learning. Currently archivists' efforts to research provenance have been stymied by an inward orientation and a focus on polishing the story in normative ways – when provenance *is* actually the institution's connection to diverse external communities, including Native populations. By providing archivists with practical means to reestablish relationships and interactions with Native populations, provenance research moves the archival profession toward a decolonized future that has been in progress since the early 1980s.[7] One of the first and biggest steps ever more archival institutions can take toward such a future is to acknowledge that the status quo is impeding progress on racial

[5] Provenance metadata is closely examined in a 2020 IDCC workshop, https://publish.illinois.edu/provenance-workshop/.
[6] S. Roberts, "Who owns erased de Kooning drawing?," *Open Space (Ownership)* 1 (2015): https://openspace.sfmoma.org/2015/11/who-owns-erased-de-kooning-drawing/.
[7] J.R. O'Neal, ""The right to know": Decolonizing Native American archives," *Journal of Western Archives* 6, iss. 1 (2015): 7, https://digitalcommons.usu.edu/westernarchives/vol6/iss1/2.

equity, community well-being, social inclusion and empowerment, and environmental justice. Heritage institutions included as partners in this ECD project have already begun to go further than such acknowledgement and rework existing practices to center transparency and accountability around collection histories; for example, "Some objects were taken as spoils of war by imperialist forces. Others were removed during periods of formal colonial rule by … private collectors. The MFA acknowledges that the life stories of many of the objects in its collection are inextricable from imperialism, colonialism, and racism."[8] Provenance research is a next step to take after such acknowledgement: Thorpe (2019) calls on archivists to "turn our gaze back on the collectors to question their motives and intentions. We need to analyze the silences in archives and consider whose memories and perspectives have been recorded. Many questions need to be more deeply explored."[9] The ECD project will articulate and supplement provenance research practices that may demonstrably be carried out as part of a broader programmatic goal of uncovering history and revitalizing relationships with current kinship and donor communities. With provenance research conducted on archival collections, archivists can demonstrate tangibly how the institution engages with culturally sensitive collections rather than merely discussing such an approach as an abstract hypothetical. Archivists can then more broadly enable a right of reply to archives, a measure which recognizes that the archives' creation may have seized and silenced Native and/or minoritized voices, perspectives, and possessions unethically and without informed consent. Building reply into collections programming, digital access through finding aid metadata and virtual exhibits, and catalog records opens a conversation with communities and depictions in the historical and artistic record, as well as the opportunity to create new works and revitalized traditions inspired by the archives.

Significance of Studying the Creation and Sharing of Acquisition Information <acqinfo> Metadata. In previous work, the Project Director examined cross-institutional use of archival metadata standards such as EAD[10] and helped envision ways that EAD3 can build more inclusive descriptive practices across the field.[11] That work noted great variability in how libraries, museums, and small organizations in particular describe the extent of a collection using <physdesc>, but such variability indicated that the underlying human processes of creating the metadata were even more important factors needing close examination to achieve promised goals of interoperability at the point of end-user access and discovery.[12] Related findings on archival description toward the aim of interoperability are echoed in the *Guidelines for Standardized Holdings Counts and Measures for Archival Repositories and Special Collections Libraries* which were approved formally by SAA and ACRL leadership in 2019. We seek in this research project to examine particular metadata creation processes qualitatively and formatively (as a means to the goals below), specifically in Stage 1. Our collection profiles will begin this facet of the study by gathering the Descriptive Identification <did> element for current EAD3 records (Description Group element in EAD 2002, Administrative Information in EAD Version 1.0) or in internal documentation. Iteratively, the profiles will articulate *both the content and the creation process* of Acquisition Information <acqinfo> (a sub-sub-element of <did>) and/or Custodial History <custodhist> where they appear in any finding aid records and/or equivalents in MARC records, fields 541 and 561 respectively. Given that most users start their research online, archival metadata is not only the interface to collections, but

[8] Museum of Fine Arts, Boston, "Colonialism" (2018): https://www.mfa.org/collections/provenance/colonialism.
[9] K. Thorpe, "Speaking back to colonial collections: Building living into Aboriginal archives," *Artlink* 39, no. 2 (2019): https://www.artlink.com.au/articles/4762/speaking-back-to-colonial-collections-building-liv/.
[10] S.A. Buchanan, "Cross-institutional usage of EAD 2002 as an archival description standard," in *Studies in archival education and research*, eds. R.J. Cox, A. Langmead, & E. Mattern (Sacramento, Calif.: Litwin Books, 2015): 109-131; A. Turner, C. Nimer, S. Buchanan, M. Combs, & E. Russey Roke, "Implementing EAD3: Study Group report and recommendations," presented by the Encoded Archival Standards Section, Society of American Archivists (12 Apr 2017): http://www2.archivists.org/groups/encoded-archival-standards-section/webinar-implementing-ead3-search-and-exploration.
[11] S. Buchanan, "Visualizing inclusive arrangement and description," presented at the CALM Open Forum (SAA/ALA/AAM Joint Committee on Archives/Libraries/Museums) 'Reaching in to reach out: Examining the state of inclusivity across libraries, archives, and museums,' SAA Annual Meeting (Portland, Ore.: 27 Jul 2017): http://sched.co/AG68.
[12] S. Buchanan & H. Li, "Collection size descriptions as archival data: The spectrum of <physdesc>," presented at TCDL: Texas Conference on Digital Libraries (Austin, Tex.: 28 Apr 2014): http://hdl.handle.net/2249.1/67039.

also a key avenue for the institution to share its collections with the world. Acquisition and provenance metadata promise a concise and feasible learning opportunity.

Broad Scope of Collections Examined During the Project. The continued presence of archival backlogs necessitates that provenance research be performed efficiently with legacy collections and new acquisitions alike. Various types of archives may already treat provenance at different stages of management, thus in this project we assemble cases that are distinguishable by scope and content: in manuscripts and rare books, Native research centers, museum archives, rural history settings, and from the law perspective. We will transform the problem of scale and collection volume into a field-wide opportunity to support self-directed and participatory learning. Institutions beyond those we will comprehend in the ECD project will be able to: reference our educational modules in conversations with all collections workers, assign and pool new contributions completed across geographic localities, and integrate skillful, properly credited pieces of research into exhibit storytelling and public engagement programming.

Approach of Project Toward Extensible Methods and Workforce Development. Extensibility in archives has emerged as part of reconceptualizing labor in recognition that whole people are bringing life to our materials in ways that merit parity and visibility. While users expect seamless online access to archives, there are accessioning, arrangement, description, and other activities necessary to meet such expectations, and perhaps to bolster outside perceptions of archives in society. To put more archives more quickly into users' hands, extensible methods have proven very effective because they emphasize baselines, levels of progress, and modular tasks that can better fit into archival workers' hours available to complete structured assignments – ones which reduce dormant backlogs. We define "extensible methods" as concrete activity guidelines motivated by the conceptual benchmarks set for an archival program, influenced by Searcy's analysis.[13] Accessioning Archivists are at the front lines of archival programs, and recent nuanced and holistic analyses of that work outline a clear space for establishing provenance research as a component of even more equitably responsive, professionalized, and collaborative practice in the future, e.g. in working with law students and legal service providers on matters of policy and documentation. The goal of provenance research in archival workplaces is to carry out mission-critical fact-gathering about the history of incoming accessions (outside the archive), with the preferred goal of averting frivolous, forged, or questionable claims of origin in the first place.

Accessioning unprovenanced items opens the institution to claims by a community or country of possible origin, as well as a more immediate loss of face or trust with that claimant. At whichever stage provenance research is finally carried out, it must be said that such research may not be reconcilable to the claimant's satisfaction *without* protracted, costly, or pressurized means of inquiry and/or legal discovery. Institutions that have taken a proactive approach to provenance research thus ideally seek to lodge the work at the beginning of any future accession and even earlier in donor relations. Yet increasingly, new and senior archivists are attending to the perhaps greater (unquantified) need to apply provenance research to "backlogs of material with minimal existing description." It is important to note that a recent OCLC Research Agenda suggested that accessioning is yet to occur for most of the backlogged material,[14] which the authors made sure to differentiate from processing (labor that mostly requires in-person presence, as "archivists at home" report in light of COVID-19's impacts). The lack of provenance research or provenance information is a key reason for that absence. The ECD project will locate and align its research activities and site investigations at the early accessioning stage of the archival enterprise for that reason. Furthermore the project pursues an explicitly modular frame when it will articulate provenance research as a sequence of activities, organized by archivists, that will welcome multiple participants and feature uniquely necessary expert contributions in final products.

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[13] R. Searcy, "Beyond control: Accessioning practices for extensible archival management," *Journal of Archival Organization* 14, nos. 3-4 (2017): 159, doi:10.1080/15332748.2018.1517292; and see C.S. Weber, "(Re-) articulating accessioning," *Hanging Together* (2018): https://hangingtogether.org/?p=6842.

[14] K. Flynn, "Issues of ownership: Leveraging accession documentation and provenance research to improve collection access," *Journal of Contemporary Archival Studies* 7 (2020): 3, https://elischolar.library.yale.edu/jcas/vol7/iss1/1.

Necessity of Provenance Researchers in Upholding Transparency and Accountability. It is vital that heritage institutions act on their awareness of need, recruit new provenance researchers to their workplace, and invest in the individuals' retention through above-market compensation. Some institutions have made investments in provenance research, and have achieved returns on those investments in multiple strengthening ways. Administrative support ensured the physical safety, display, and later legal acquisition of a number of works at one museum.[15] A professor of anthropology (Abenaki) has used restorative methodologies with graduate students to transparently open written and oral histories, revitalizing connections between Native objects, contemporary Native communities, and tribal and nontribal archives.[16] Research on displaced archives has renewed attention to post-1993 international returns, recently recognized by the SAA.[17] Provenance researchers play a central role in resolving ownership disputes and advancing institutional accountability – assisting legal counsel by gathering archival evidence from unlikely places (walls during a retail renovation, the earth while gardening, or Peggy Guggenheim's scrapbooks), tracing centuries of transfer, and/or maintaining the Artive Database. Finally, the nonprofit Red Arch Cultural Heritage Law and Policy Research collaborates with an academic museum and working dog program to detect looted works.[18] The above singular examples demonstrate the validity of a provenance research approach to missing information and its overall effectiveness, but still leave open questions of process and capacity that match the IMLS Scaling phase of maturity which is embedded in this project. While calls for collection-based accountability can be externally driven by members of a nearby or impacted community, they have served as decisive, instigating events that compel the creation of permanent, full-time provenance research position(s). This project will work to scale such outcomes more broadly by: demonstrating the values of provenance labor, funding and crediting provenance contributors' labor, and foregrounding material support and mentorship to all members of the research team, as recommended in the Collective Equity Handbook (IMLS NLG).[19]

Expanding Provenance Workforce Capacity. This ECD project views provenance research as a space for proactive inclusion in the archival field. As Santamaria asserts, "archives exist to be used"[20] and fortunately archives, including those we will study closely, do enjoy a broad user audience (global, in the case of online users) cultivated through collections work, digital presence, and individual relationship-building. Many of the PD's archives students write that just such an experience, encountering a finding aid or exhibit, compelled them to pursue an archivist career pathway, but now find that provenance research is far too rarely a standalone position; more often it is embedded in a position with broad collections responsibility. Few participants in a recent provenance workshop series had provenance in their job title, and very different, unmodified scope has impeded the sharing of such knowledge to archivists.[21] As we recognize that standing, our project works to articulate explicitly many more outward-facing contributions dedicated archival provenance work can make (see OER Parts 1-2D below) for an institution. A marker of this project's success will be the embedding of one or more provenance-related activities into archivists' daily work routines that were previously thought to be outside their purview or infeasible. The activities will provide mutual learning experiences to professionals and

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[15] M. Mallon, "A refuge from war: The Nelson-Atkins Museum of Art and the evacuation of art to the Midwest during World War II," *Getty Research Journal*, 8 (2016): 157, doi:10.1086/685920.
[16] M. Bruchac, "On the Wampum trail," https://wampumtrail.wordpress.com/.
[17] P. Kennedy Grimsted, "Pan-European displaced archives in the Russian Federation: Still prisoners of war on the 70th anniversary of V-E Day" in *Displaced archives*, ed. J. Lowry (New York, N.Y.: Routledge, 2017): 130-157, and see https://www2.archivists.org/groups/archival-history-section/grimsted-archival-history-article-award-acceptance-remarks-august-20.
[18] C. Speer Lejeune, "Dogs may soon be on the front lines in the fight against artifact smuggling," *Smithsonian* (2018), https://www.smithsonianmag.com/history/dogs-front-lines-artifact-smuggling-180968398/.
[19] *Collective equity!: A handbook for designing and evaluating grant-funded positions* (2020), doi:10.26207/6p4a-md61.
[20] D.A. Santamaria, *Extensible processing for archives and special collections: Reducing processing backlogs* (Chicago: Neal-Schuman, 2015): ix.
[21] The Association of Art Museum Directors (AAMD) has offered such workshops, including one the PD attended in 2018, since at least 2011 that usually examine specific kinds of *artifacts* or have pre-requisite limitations; and there is a provenance organization in Germany (AfP). American archival collections have no parallel resource yet contain huge unexamined needs, that the project takes up.

students with whom they can collaborate, developing within everyone transferable skillsets driven by multi-sector and multi-disciplinary needs.

II. PROJECT DESIGN. Informed by the project director's experience working in archives and coordinating multi-sited research, this project will occur over three years with organized stages of data collection, analysis including member-checking and advisor feedback, and open dissemination. A collection professional at each field site has agreed to partner in this research by providing access to institutional manuals, collection records and documentation, lists of researcher publications, and routine work time availability for site visits and instruction observations. At each field site, provenance research is well-established locally (as per the IMLS LB21 Exploring phase), but there is little to no sharing of best practices yet. Designed as a sequential and cumulative study across field sites, the Project Director will employ qualitative ethnographic methods of observation, interviews, collection case study, and document analysis in support of the research questions. Two Student Researchers will be recruited to assist in communicating with and visiting sites and analyzing the data. Relatedly, the project will employ an activity theory **framework** to answer the research questions and to generate extensible, modular methods of provenance research. Activity theory is applicable to our scope because it emphasizes outcome-oriented everyday practice as well as description rather than prediction. Pilot experiences suggest that provenance research is carried out retrospectively for known collections, though the project will also explore situational factors and resource needs for conducting provenance research on prospective and pending acquisitions.

As one of the first projects to examine provenance research (a) using a purposively multi-sited approach, and (b) by foregrounding diverse collections, the project is initially located in the IMLS **Piloting** phase of maturity; in Year 3 the integration of selected instructional materials into established archives courses will permit its progression into the **Scaling** phase. Table 1 maps each research question (RQ) to the corresponding stage (bolded) and within-stage activities of the research project. The stages of the project, including research methods used for completing each activity, and their timing in the Schedule of Completion, are then more fully detailed.

Research Question	**Primary Corresponding Stage (bolded) and Key Project Activities**	**Phase of Maturity for the Project Activity**
1. How do practitioners complete provenance research?	**Data Collection**: *conduct* site visits; initial data analysis (Years 1 & 2)	Piloting
2. Which methods best expand public engagement with collections?	**Data Analysis**: *conduct* assessments & synthesis of all qualitative data; *draft* training and OER materials with Advisors' feedback (Year 2)	Piloting
3. What learning outcomes would undergraduate provenance researchers experience?	**Open Educational Resource**: *use* materials in undergraduate course, Fall 2022 & graduate course, Spring 2023; *conduct* pre- and post-instruction assessments (Year 3)	Scaling

Table 1. Mapping of project research questions, activities, and their phase of maturity.

RQ: How do practitioners complete provenance research?

Stage 1: Data Preparation and Data Collection (Timeline: Year 1).

Project Activities and Methods: In the first half of Year 1, IRB approval, student recruitment, interview protocol refinement and an environmental scan to identify practitioners engaged in provenance research in collaboration with the advisory board will be completed. As part of the IRB submission, the Research Team will develop the pre- and post-OER assessments for use with the participants at our seven research sites, as well as the pre- and post-instruction assessments for use with the undergraduate and graduate students who will engage with an OER module in courses taught by the Project Director during Year 3. Site and collection profiles will be prepared in collaboration with practitioners at each of our seven partner sites, that will contextualize the history and audience of specific diverse objects at the collection level. The profiles will mention uses of collection items in instructional classroom experiences and will collect metadata available on the collection, especially retrospective provenance.

Part of the discovery to occur during Stage 1 will be an understanding of the scope of work expected under particular job titles assigned to individuals who are currently engaged in provenance research, both at the selected sites and at peer institutions. Current titles for such individuals, gathered during previously conducted pilot work, are outlined in Table 2 below. Previous pilot work has also indicated that where provenance guides exist, they are too specific: either to art objects and not archives or to high-profile objects drawing on singular institutional documentation (and published as case studies in the scholarly literature). The focus of this project remains on methods, and methods that are generalizable, practical, extensible for small institutional teams, and accessible as modules for teaching provenance newcomers. The site visits will build on information gathered in the collection profiles, specifically by affording the team to observe where the individual provenance researcher is located within the organization (and their proximity to archival accessioning). Site selection is addressed in more detail in the following Section III, but for purposes of completing Stage 1 it is the *domain* which is most crucial to meeting our project design goals rather than the specific institution to be visited within that domain.

Domain of Site and Collections	**Job Title of Provenance Participant**
1 – Special Collections	Rare Books Librarian (Special Collections & Archives, DePaul University Library). alternatively, Archivist and Judaica Public Services Librarian (Katz Center, University of Pennsylvania)
2 – Special Collections	Research & Educational Services Archivist * (Special Collections, University of Arkansas Libraries)
3 – Comprehensive Art Collection	Provenance Specialist (Nelson-Atkins Museum of Art)
4 – Rural History Collection	Registrar (Plains Art Museum in N.D.)
5 – Native Collection	Provenance Senior Research Associate (Native American Art and Culture, Lowe Museum)
6 – Native Collection	Librarian (Osage Nation Museum)
7 – Law Firm	Provenance Researcher (Hahn Loeser & Parks LLP)

Table 2. Domains of participating sites and of participating provenance workers.

* Author of the recent article, “Issues of Ownership: Leveraging Accession Documentation and Provenance Research to Improve Collection Access” (footnote 14) and based at a peer institution.

In Stage 1 at least four assessments will be developed: pre- and post-visit for site participants, and pre- and post-instruction for students. In the pre-site visit assessment the Project Director and participants will together begin to differentiate provenance research from archival accessioning *in particular settings*, working throughout the site interactions to articulate how the former supports or is interconnected with the latter. In the second half of Year 1, visits to the field sites for data collection and assessment of provenance practices will be completed. As a step toward ensuring research continuity, the Project Director will be ready to employ mobile or virtual ethnographic methods, using desktop and smartphone applications like Indeemo, Dedoose, and Temi, in the event that in-person visits are not feasible for pandemic reasons. Such platforms allow participants to share documents, screens, and process-based activity workflows in synchronous or real-time, and can supplement conversations by email and other means. Goals for this stage encompass seven planned observational site visits to variably-sized collections in distributed geographical regions of the U.S., scheduled in collaboration with site participants to coincide with key interaction sessions involving college students.

RQ: Which methods best expand public engagement with collections?
Stage 2: Data Analysis (Timeline: Year 2).

Project Activities and Methods: Iterative analysis of provenance research cases observed at each field site will have begun in Year 1, and the core data analysis activities will be completed in Year 2. The Project Director and Student Researchers will use ATLAS.ti software to rigorously assess and synthesize qualitative data for publication and dissemination. The research team will identify preliminary findings, discuss and solicit feedback from the project advisors, and submit preliminary findings to professional conferences. The researchers will strive toward interpretive and theoretical credibility by submitting the preliminary findings back to site participants as member checks, inviting their critical analysis, revising toward agreement, and incorporating additions. At Stage 2 the researchers will also continue to meet with project advisors to prepare and review drafts of publications that will carry into Year 3.

RQ: What learning outcomes would undergraduate provenance researchers experience?
Year 3: Open Educational Resource (OER) and Research Sharing (Timeline: Year 3).
Project Activities and Methods: In Year 3, efforts will be focused on development and rollout of the OER with undergraduate and graduate archives students. Specifically, in Fall 2022 we will pilot from Part 2 of the OER (detailed below in Section III) the “Learning a Collection’s History” module with undergraduate students enrolled in an honors course on material culture that Dr. Buchanan has taught annually since Fall 2017. In Spring 2023 we will pilot from Part 2 the “Methods for Gathering Information” module with graduate students enrolled in the course ISLT 9490 Archival Practice that is part of the Archival Studies specialization directed by Dr. Buchanan at the university. In the second half of the year once sites too have engaged with the OER, we will conduct post-visit instrument-based assessments that will ask respondents to reflect on the modules and describe their in-progress or planned efforts to integrate extensible provenance research methods in their daily workflows. Findings from both the classroom and archival institution experiences using the OER as part of ongoing archival practice, including theoretical and quantitative analyses, will be organized and submitted for multiple publications. The OER will remain a living document updated following its use in future teaching semesters and collecting workplaces. The Student Researchers and Project Advisors will receive support and mentorship to enable continued skills development and professional advancement.

Replicability and Sharing Research Findings: In addition to the lesson modules, the researchers will share all project-original research data in our open educational resource (OER), including results, instruments, and codebooks from the four pre- and post-resource and instruction assessments conducted by the research team, anonymized as appropriate. The research team will determine a publications plan in consultation and collaboration with project advisors, that will include feature-length essays about provenance research in library and archival magazines as well as peer-reviewed works. Outputs at this stage of the project will include the publication of results in open access journals, and their presentation at national conferences in the archival and museum disciplines, such as SAA and AAMG. Such products will integrate and analyze items accessible in the OER, based in an established institutional repository intended for wide use by practitioners. The above publications, assessments, and lesson plan modules will furthermore be communicated in reports to IMLS.

III. DIVERSITY PLAN. This research project addresses diversity and inclusion issues in three specific ways: in its selection of sites, research team composition, and collaborative creation of an Open Educational Resource (OER) digital inclusion product. An Indigenizing ethos will permeate the research activities and the OER product – extending archival work that has already begun to critique the colonialism inherent in traditional provenance applications.[22] The project is aligned with the U.N. 2030 Agenda and its Sustainable Development Goal (4) of Quality Education, in making provenance *relevant* via our intercultural grounding. Our process of change and of decolonizing provenance practices will follow Universal Design for Learning guidelines, activating strategic networks to provide multiple options for expressing and communicating the provenance

[22] J. Drake, “RadTech meets RadArch: Towards a new principle for archives and archival description,” presented at the Radcliffe Workshop on Technology & Archival Processing (Cambridge, Mass.: April 4-5, 2016): https://medium.com/on-archivy/radtech-meets-radarch-towards-a-new-principle-for-archives-and-archival-description-568f133e4325.

information so crucial to collections use. While the OER modules will emphasize that provenance research, like decolonizing archives, is indeed not a checklist but a process that will vary by situation (e.g. naming practices, programming, service commitments, visuals and text), a modular approach will ultimately broaden provenance engagement and build skills. The project's collective impact assessment of multiple stakeholders, including diverse college student populations, is addressed in the next section.

Site Selection. The project field sites are purposively selected so as to uncover a broad range of issues and potential solutions related to whole-collection management for conducting provenance research. Sites include multiple academic special collections research centers, museum archives in a comprehensive / encyclopedic art collection, a rural history collection, Native collections, and a law firm specializing in cultural heritage law. Their diverse user communities were identified from pilot work examining the spread of provenance practices across the cultural heritage (law) field and from advance conversations with Project Advisors. Beyond direct communication about their perspectives and experiences during site visits, all users will receive a link to the OER in draft form, a suggestion form, and ongoing support from the PD. The site selection mutually supports the project's emphasis on expanding services to diverse populations, specifically by focusing on the information needs and interests of provenance newcomers – esp. college students (20-25 years) across majors, pre-service and in-service archives professionals – and about diverse materials, in centering Native provenance study.

Research Team. The composition of our project team (PD, Student Researchers, and Advisory board members) is diverse in terms of gender, cultural/ethnic background, career stage and setting, and socioeconomic status. The PD is a Hispanic woman who has experience completing data curation activities with collections using multi-sited ethnographic methods,[23] work that received the ASIS&T ProQuest Doctoral Dissertation Award. She completed the Certificate in Provenance Research offered through Tulane University Law School, 2018. She has used inclusive recruiting practices in previous funded research (IMLS Public Broadcasting Preservation Fellowship) while serving as an Assistant Professor of Archival Studies. She will use this knowledge and experience to recruit two Graduate Research Assistants to perform defined roles in communicating with and visiting sites and analyzing the data collected there. The GRAs will be drawn from a socioeconomically diverse student body that is 57% female, and 65% Missouri residents, a majority from rural Greene, Boone, and Jackson counties where median household incomes are $56,000 or less (https://datausa.io/). Four experts, men and women, who have agreed to serve as Project Advisors bring diverse backgrounds, experience, and training with Asian American, Latin American, and Native American collections in particular.

Open Educational Resource (OER) Product Development. The project addresses provenance research as a set of interconnected 21st-century issues: skills, access to knowledge, and practical applications; in that way it enacts the principle of digital inclusion. We employ the broad framework of digital inclusion to reinforce the project's comprehensive approach to fostering growth, inclusion, and retention in the provenance workforce. (In addition to workforce applications, digital inclusion also encompasses access to knowledge and adoption of practices; the latter will be measured in Year 3 using post-visit assessment instruments). Our digital inclusion approach accommodates people serving in multiple roles around provenance: learner, practitioner, research collaborator, and peer mentor. *Based on data* collected during the site visits, the Project Director will create training and instructional materials to communicate extensible provenance research methods. The materials will be made freely available online and will be organized in the form of an OER to meet needs of two key stakeholder groups: (Part 1) working professionals, and (Part 2) undergraduate and graduate student learners.

A preliminary outline for Part 1 is: (a) Basic Provenance Research Principles, (b) Scoping Your Collection's Provenance Research Gaps, (c) Structuring Provenance Metadata, and (d) Communicating Provenance Information. A preliminary outline for Part 2 is (a) Provenance Research in Heritage Settings, (b)

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[23] S.A. Buchanan, "The assemblage of repository and museum work in archaeological curation," *Information Research* 24, no. 2 (2019): paper 816, http://www.webcitation.org/78mjUYkhj.

Learning a Collection's History, (c) Methods for Gathering Information: oral history, document analysis, indexes, catalogs, and resources, and (d) Internal and External Provenance Storytelling.

IV. BROAD IMPACT. While provenance research outcomes are commonly perceived to attract scholars and researchers, this project will bridge empirical data collection to best methodological practices, and assess their public and pedagogical use. Broadly, the project seeks to translate important knowledge about how to create object biographies and collection histories, into an open access toolkit and lesson plan supporting strategic collaborations between archival educators, lifelong learners, and multiple provenance stakeholders. Publications will draw on the open access toolkit itself as well as multiple assessments of its use (with copies deposited into the dual-institutional repository MOspace and presented in a project website) and will be submitted to scholarly and professional venues read widely by library and archives professionals, including *RBM: A Journal of Rare Books…Cultural Heritage*; *The American Archivist*, *Collections: A Journal for Museum and Archives Professionals*; *Archivaria*, *Collection and Curation*; *Digital Scholarship in the Humanities*, and *Provenance*. All of the above are gold or hybrid open access.

Mitigating Limitations. While the OER accessibility is partially driven by the aim of testing scalability of the methods beyond any one institution, we will only be able to encounter a limited number of sites for reasons of feasibility within the project timeline. Relatedly the OER will initially be rolled out in undergraduate and graduate classrooms (traditional and online) at one institution. Acknowledging such limitations, the ECD project adheres to a tight scope that was introduced in Section I above: that of examining provenance research as it is necessary for *archival* practice and specifically as part of the archival acquisitions stage, and as an activity performed by archivists and taught to archivists-in-training. The gathering of EAD descriptive metadata for the site and collection profiles, and the emphasis on documentary rather than visual analysis, exemplifies this scope in action. Assessments are built into the pre- and post-interaction activities conducted in Years 1 and 3, and will generate quantitative data in coordination with the qualitative data from site visits and instruction; the collective datasets will mitigate gaps that may arise in examining practice or knowledge at any particular site. Practitioners will be asked to reflect on strategies and data-informed methods for conducting provenance research, which will open a continuous conversation on creative solutions and collective directions to pursue.

Collective Impact Approach and Assessment: The project will support the development of a diverse workforce of library and archives professionals by (1) broadening the availability of training resources, and (2) directly involving student populations in identifying challenges related to communicating provenance information for collections housed and exhibited. Based on our acknowledgement that multiple professional domains (archives, libraries, museums) interact with or need provenance research, the ECD project works toward defining extensible methods that are applicable and generalizable, beyond any one collection as has characterized existing resources. Using a collective impact approach, project personnel will seek input from a diverse set of in-service professionals and collections stakeholders, using the findings to create data-informed research outputs supporting effective provenance research skills development in settings like our partner sites. We will conduct assessments with each stakeholder group at regular intervals across the three-year period: pre- and post-site visit in the case of working professionals, and pre- and post-instruction in the case of undergraduate and graduate student learners. The assessments will measure provenance skills and pre-service experiences and the application of support tools, workflows, and strategies outlined in the new modules. Inclusion of socioeconomically and geographically diverse (as one-third of our graduate online archives students live and work outside the state) students in all aspects of the research study supports the Project Director's mentorship goals, and the research products aim to broaden participation in archival provenance practice by outlining practical steps for smaller institutions. Our materials can be widely adopted by collection professionals, instructors, and administrators.

University of Missouri

Schedule of Completion

YEAR 1 (2020-21)												
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Activities												
Project Management												
Recruit Graduate Research Assistant (Pre-Award)												
Consult and meet with advisors												
Data Preparation												
Develop informed consent and interview protocols												
Develop four (4) pre- and post-OER assessments												
Secure IRB Approval												
Site Scheduling: Recruit provenance professionals												
Site Scheduling: Pre-visit communication												
Conduct pre-visit/OER assessment												
Prepare site and collection profiles												
Data Collection												
Site 1: special collections												
Site 2: special collections												
Site 3: museum archive collection												
Site 4: rural history collection												
Site 5: Native collection												
Site 6: Native collection												
Site 7: law firm												
Initial Data Analysis												
Recording and transcription of interviews												
Iterative site visit memoing												
Compile associated field artifacts												
Load transcriptions into ATLAS.ti												
Open code the transcripts												
Sites: Post-visit communication												

YEAR 2 (2021-22)												
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Activities												
Data Analysis (cont.)												
Open code the transcripts (cont.)												
Sites: Member-checking of artifacts and memos												
Synthesis of all qualitative data												
Open Educational Resource (OER) Planning												
Drafting of training and instructional materials												
Consult and meet with advisors												

YEAR 3 (2022-23)												
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Activities												
Open Educational Resource (OER)												
Establish institutional repository microsite modules												
Write training and instructional materials 1.0												
Iterative review of materials with sites												
Conduct post-visit/OER assessments												
Pilot use of materials in undergraduate course (Fall)												
Pilot use of materials in graduate course (Spring)												
Conduct pre- and post-instruction assessments												
Sharing results (in open-access venues)												
Preliminary findings presentations												
Collaborative publications planning with advisors												
Core findings submission for presentation at practitioner and virtual conferences												
Share research data per journal data policies												
Roll out and refine OER												
Integrate modules into permanent courses												
Research publications												
Research presentations												

DIGITAL PRODUCT FORM

INTRODUCTION

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to digital products that are created using federal funds. This includes (1) digitized and born-digital content, resources, or assets; (2) software; and (3) research data (see below for more specific examples). Excluded are preliminary analyses, drafts of papers, plans for future research, peer-review assessments, and communications with colleagues.

The digital products you create with IMLS funding require effective stewardship to protect and enhance their value, and they should be freely and readily available for use and reuse 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

If you propose to create digital products in the course of your IMLS-funded project, you must first provide answers to the questions in **SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS.** Then consider which of the following types of digital products you will create in your project, and complete each section of the form that is applicable.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS
Complete this section if your project will create digital content, resources, or assets. These include both digitized and born-digital products created by individuals, project teams, or through community gatherings during your project. Examples include, but are not limited to, still images, audio files, moving images, microfilm, object inventories, object catalogs, artworks, books, posters, curricula, field books, maps, notebooks, scientific labels, metadata schema, charts, tables, drawings, workflows, and teacher toolkits. Your project may involve making these materials available through public or access-controlled websites, kiosks, or live or recorded programs.

SECTION III: SOFTWARE
Complete this section if your project will create software, including any source code, algorithms, applications, and digital tools plus the accompanying documentation created by you during your project.

SECTION IV: RESEARCH DATA
Complete this section if your project will create research data, including recorded factual information and supporting documentation, commonly accepted as relevant to validating research findings and to supporting scholarly publications.

SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS

A.1 We expect applicants seeking federal funds for developing or creating digital products to release these files under open-source licenses to maximize access and promote reuse. What will be the intellectual property status of the digital products (i.e., digital content, resources, or assets; software; research data) you intend to create? What ownership rights will your organization assert over the files you intend to create, and what conditions will you impose on their access and use? Who will hold the copyright(s)? Explain and justify your licensing selections. Identify and explain the license under which you will release the files (e.g., a non-restrictive license such as BSD, GNU, MIT, Creative Commons licenses; RightsStatements.org statements). 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.

Intellectual property and copyrights will be retained as outlined in the Bayh-Dole Act. All digital products will hold a Creative Commons CC-BY 4.0 license, which will allow sharing and adaptation of materials with attribution. The PD will grant MOspace a non-exclusive distribution license.

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.

Intellectual property and copyrights will be retained as outlined in the Bayh-Dole Act. All digital products will hold a Creative Commons CC-BY 4.0 license, which will allow sharing and adaptation of materials with attribution.

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.

This project poses no more than minimal risk to its participants. The privacy and confidentiality of study participants will be protected and all reasonable steps will be taken to ensure participants' anonymity in research results. The names of participants and sites will be anonymized or pseudonymized prior to data sharing or publication, unless and only unless study participants request identifiability. If digital products require obtaining permissions or rights, we will apply for those permissions. We will work with an advisory board to ensure that our materials are culturally inclusive, but will make products available for adaptation so that they can be modified to meet the needs of specific cultures as needed.

SECTION II: 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.

Digital content to be created will include written notes and transcripts (hundreds of pages), original photograph and audio datasets (perhaps 2000 items), lesson plan and educational toolkit materials, presentation slides, accepted manuscripts, and interim and final reports. Besides written notes, all products are born-digital and will primarily use .doc, .pdf, .jpeg, .xls, and .html formats.

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

We will use Microsoft Office to create the primary digital content. Interviews onsite will be recorded with an Olympus VN-7200 digital voice recorder, and conducted using headset microphones when needed. The audio recordings will be transcribed by Temi or Indeemo at market rate. The Researchers will use ATLAS.ti for data analysis.

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG, OBJ, DOC, PDF) you plan to use. If digitizing content, describe the quality standards (e.g., resolution, sampling rate, pixel dimensions) you will use for the files you will create.

We plan to use .doc, .pdf, .jpeg, .wav, .mp4, .xls, and .html digital file formats, and do not plan on digitizing any content.

Workflow and Asset Maintenance/Preservation

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

The PD will manage the proposed deliverables, review all data and data project products before publication. The graduate research assistant will also review products as they are synthesized, and participate in quality assurance of the coding, transcription, and anonymization of collected materials. We will monitor our workflow by adhering to the schedule of completion and by asking our advisory board to review drafts against their knowledge and expertise.

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period. Your plan should 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).

During the project, all researchers will attend data management workshops at the University Libraries and will adhere to Research Data Security best practices established by the University of Missouri System. Files will be backed up at least monthly using offline, external hard drives for storage. Digital products prepared for dissemination will be preserved on servers maintained by the University of Missouri's institutional repository, MOspace, based at Ellis Library.

Metadata

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

The Project Director will produce any and all metadata for the digital products. We anticipate using MODS for descriptive metadata, and will reference the Getty Thesaurus of Geographic Names (TGN) when describing relevant place names. The University's institutional repository, MOspace, cross-walks MODS records to Dublin Core for harvesting. The project will not be creating finding aids using EAD.

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

Metadata during the project will be created through the digital voice recorder and managed through Temi, Indeemo, or ATLAS.ti for specific items on a temporary basis. Metadata we submit to the institutional repository for long-term preservation and access will be compliant with MODS and Dublin Core standards.

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).

Metadata and digital products for dissemination will be made available through MOspace, which is searchable via Google and other search engines. Additionally, all research data will be linked to via the project website and listed on the PD's ORCID iD and ResearcherID.

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, delivery enabled by IIIF specifications).

Materials will be openly available online via MOspace, the institutional repository of the University of Missouri. MOspace is based on MIT's open source DSpace technology and is a joint venture of the University of Missouri's Division of Information Technology and the University Libraries. MOspace items will include appropriate metadata and a permanent URL. Items will be freely available via the MOspace website at https://mospace.umsystem.edu and will be searchable via Google and other search engines. Materials will also be delivered via a mobile-friendly project website compatible across browsers.

D.2. Provide the name(s) and URL(s) (Universal Resource Locator), DOI (Digital Object Identifier), or other persistent identifier for any examples of previous digital content, resources, or assets your organization has created.

"SISLT - School of Information Science & Learning Technologies," https://sislt.missouri.edu/

"LIS radio," https://mospace.umsystem.edu/xmlui/handle/10355/68701

"Diving into history: LIS in-service experience at the Black Archives of Mid-America," https://hdl.handle.net/10355/61768

"Personal Digital Archiving," https://pda.missouri.edu/

SECTION III: SOFTWARE

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.

n/a

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

n/a

Technical Information

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

n/a

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

n/a

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

n/a

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

n/a

B.5 Provide the name(s), URL(s), and/or code repository locations for examples of any previous software your organization has created.

n/a

Access and Use

C.1 Describe how you will make the software and source code available to the public and/or its intended users.

n/a

C.2 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

n/a

URL:

n/a

SECTION IV: RESEARCH DATA

As part of the federal government's commitment to increase access to federally funded research data, Section IV represents the Data Management Plan (DMP) for research proposals and should reflect data management, dissemination, and preservation best practices in the applicant's area of research appropriate to the data that the project will generate.

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

Data collected will be written notes, photographs, and audio recordings from individual interviews, which will be transcribed under the supervision of the PD manually and through a transcription service provider such as Temi or Indeemo. Interviews for transcription and analysis will be conducted once or twice at seven site visits between September 2020 and August 2022.

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?

Yes, the proposed research activity requires IRB approval and all data collection practices will be reviewed by the Campus Institutional Review Board (Campus IRB) of the University of Missouri, Office of Research. An IRB application will be submitted after grant approval, and as outlined in the schedule of completion we expect to secure approval at the start of Year 1, with reapplications for approval as directed by the Campus IRB.

A.3 Will you collect any sensitive information? This may include personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information. If so, detail the specific steps you will take to protect the information while you prepare it for public release (e.g., anonymizing individual identifiers, data aggregation). If the data will not be released publicly, explain why the data cannot be shared due to the protection of privacy, confidentiality, security, intellectual property, and other rights or requirements.

No, the PD will not collect PII or any proprietary information during interviews. Participant names and organizational affiliations will be collected during the study recruitment, but the PI will not share that publicly unless agreed upon with informed consent for a specific publication or presentation. Datasets shared publicly will be anonymized to protect participant privacy and confidentiality and will contain no PII.

A.4 What technical (hardware and/or software) requirements or dependencies would be necessary for understanding retrieving, displaying, processing, or otherwise reusing the data?

Researchers will use notebooks, computer hardware and software (Microsoft Office, and in part ATLAS.ti, Temi, Indeemo, Qualtrics) to generate and capture data from the research project, and most data will be converted to PDF for future use. Backwards compatibility in Adobe Acrobat will be necessary to read PDF documents.

A.5 What documentation (e.g., consent agreements, data documentation, codebooks, metadata, and analytical and procedural information) will you capture or create along with the data? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the data it describes to enable future reuse?

As noted earlier, interviews will be recorded and transcripts will be generated in .wav and .doc formats. The transcripts will be coded in ATLAS.ti, and most of the textual data will be converted to PDF for preservation and future reuse. Interview transcripts and subsequent codebooks and keys will be generated and stored as .doc format on the external hard drive and only fully accessible to the PD. In Year 3 anonymized interview data and an accompanying codebook will be deposited in the MOspace institutional repository to enable future reuse.

A.6 What is your plan for managing, disseminating, and preserving data after the completion of the award-funded project?

We will deposit any shareable datasets and digital products into MOspace for long-term preservation and dissemination, and will grant MOspace a non-exclusive distribution license.

A.7 Identify where you will deposit the data:

Name of repository:

MOspace Institutional Repository

URL:

https://mospace.umsystem.edu/xmlui/

A.8 When and how frequently will you review this data management plan? How will the implementation be monitored?

The PD will review this data management plan at the end of each year during the grant period: in August 2021, August 2022, and August 2023. The implementation will be monitored by the PD and advisory board members during quarterly meetings. Datasets will be curated and preserved according to the practices of MOspace.