Title: Measuring the Impact and Value of Makerspaces in Public Libraries

Overview: The University of Illinois at Urbana-Champaign (UIUC) and Indian Trails Public Library District (ITPLD, Illinois) propose a National Leadership Exploratory Planning Grant titled Measuring the Impact and Value of Makerspaces in Public Libraries. This **$100,000 exploratory** project will provide the tools needed **for the development of an initial framework and future toolkit for measuring the impact and value of public library makerspaces** in the lives of users and the communities that libraries serve. Impact refers to the effect on the lives of stakeholders in promoting **lifelong learning** and exploration, increasing creative thinking and complex problem solving, and developing a community around making. Value centers on how makerspaces have helped libraries **achieve excellence** as organizations and to effective community development. As public libraries evolve to meet the lifelong learning needs of the community and offer creative spaces, traditional library measurements and statistics do not accurately reflect the full economic, educational, and social impact of the services in the community. Public libraries need to seek new ways of telling the story of their use and the transformative effect a library has on the life of the community. The proposed **one-year, exploratory planning project** would run from 9/1/2020-8/31/2021 and is intended to provide a baseline framework for evaluating a non-traditional service in public libraries which would add to the professional knowledge of public librarians nationally and help them achieve excellence in services to their communities.

Statement of National Need

Makerspaces, maker labs, and other inquiry-based community learning spaces can be found in public libraries across the country. In recent years, there has been a significant increase in professional and scholarly research on these spaces. For example, there are many practical guides to developing a makerspace in the library such as Makerspaces: A Practical Guide for Librarians (Burke & Kroski, 2018) and the Makerspace Librarian's Sourcebook (Kroski, 2017). Since they are primarily conceived of as learning spaces, there are also several studies that assess individual skills that are developed in makerspaces (Finley, 2016; Willett, 2017). There are two recent IMLS-funded initiatives that also focus on individual learning outcomes in makerspaces: The University of Wisconsin-Madison and Maker Education Initiative National Forum on Research and Assessment in Makerspaces and the Assessment for Learning in Library Makerspaces at the University at Buffalo, SUNY. However, a survey of the literature demonstrates that although stakeholder evaluation (as opposed to learning outcome assessment) is an important aspect of understanding there is little information on how to demonstrate the value and impact makerspaces have in their communities. As the authors of the MakerEd white paper state "individual surveys and circulation numbers only tell a small fraction of the richer story at hand. Additionally, much assessment focuses solely on the individual level, but the ways in which to tell the tales of the collective group could be quite revealing" (Chag, S., et al, 2019 p. 20). The proposed project is intended to find a way for libraries to tell these tales.

The proposed exploratory planning grant project builds on and expands several previous studies. For example, Koh (a co-PI), Abbas, and Willett (2019) argue that, beyond simply being a space for individual learning, library makerspaces play distinct social roles within a community by promoting knowledge creation, access, learning, and equity and diversity (p. 29). In particular, Koh et al. argue that "library makerspaces represent a shifting role of libraries as an institution for knowledge creation" (p. 20). The conceptualizations of library makerspace communities and

roles developed in their work will inform this project that aims to assess the value and impact of makerspaces. The IMLS and Children's Museum Pittsburgh's (2016) project *Making + Learning in Museums and Libraries* provides three categories for measurement: purpose, people, and pieces and parts. The goals of this project also complement the work of Measures that Matter (https://measuresthatmatter.net/) and the final deliverable may be used as a new indicator for community impact. In addition, the project may be a source of additional surveys for patrons for Project Outcome (https://www.projectoutcome.org/). Although this application is solely for a planning grant that will lead to a white paper, the proposed final deliverable of the full project is a flexible, intuitive toolkit for evaluating the impact and value of makerspaces in public libraries. The audience for the toolkit is public library administrators, department managers, and other staff and is intended to help them advocate for and evaluate the effectiveness of their makerspaces. The toolkit would be a primer for effective evaluation of public library makerspaces. It would include definitions of terms, information on how to identify intended outcomes, templates for evaluating makerspaces, recommendations for data collection options, and relevant examples.

Relevance to IMLS Strategic Goals and Priorities

Instead of focusing on individual learning outcomes and skills development, this project is focused on understanding the value to and impact of public library makerspaces on the entire community. As Tenopir (2011) notes, implicit values such as usage statistics "do not show purpose, satisfaction, or outcomes of use" (p. 6). This pilot planning grant is the first step in establishing variables for what Tenopir calls explicit and derived value evaluation that would be used in the toolkit and determining the infrastructure for deployment. These variables will be described in a freely available white paper that will be posted to the University of Illinois online open access depository, IDEALS.

The project is in keeping with several IMLS 2018-22 priorities and goals. First, makerspaces are instrumental in promoting lifelong learning in communities and providing cross-disciplinary and inquiry-based methods of learning. Second, once completed, the overall project will help public libraries build capacity through the creation of a toolkit based on the white paper that will help administrators design makerspaces that are trusted spaces for community engagement. Finally, the proposed toolkit will help public libraries increase access by creating an evaluative instrument for determining if makerspaces and associated resources are accessible to people of all background and abilities.

Project Design

The guiding question for this overall project centers on determining the factors for evaluating makerspaces in public libraries. The overall goal of the project is to create a distributed toolkit that public libraries can use to assess the value and impact of their makerspaces in their communities. For this pilot study, through analysis of focus group sessions, the research team will determine a baseline framework and factors for evaluating the value and impact of public library makerspaces on communities. This framework will be published in a freely available white paper.

Phase 1 - Pre-Planning

The research team will conduct 12 focus groups of 5-7 people at three different public libraries with four groups of targeted participants. Focus groups are an effective research method for this

project because they are subject to what Lindlof and Taylor (2002) call "chaining" or "cascading effects" among the participants (p. 182). The focus groups will take place at an exurban, a suburban, and an urban public library in Illinois with makerspaces that serve all ages and have been established for varying amounts of time. Two of the makerspaces are "clean" meaning that they have equipment such as 3D printers and laser cutters that do not create dust or debris. One makerspace is digital meaning that it focuses on software instead of more traditional crafts such as sewing. All three are located in dedicated space.

The staff and administrators of the sites will be instrumental in recruiting diverse and representative participants in the four focus groups. It is anticipated that recruitment and meeting planning will take approximately two months. PI Emily Knox and a doctoral student will coordinate recruitment and logistics across all three sites. The focus groups will target the following participants: 1. Administrators and staff 2. Makerspace users 3. Library stakeholders who are not makerspace users. 4. Community leaders. The first two groups will account for the stated goals and outcomes of the makerspace while the third group will bring in evaluative measures from people who are general community members. The final group would include local government leaders; school superintendents, administrators or teachers; and workforce development professionals who will be able to speak more broadly to community impact. This project is intended to explore the value of makerspaces for the entire community and not just for those who are directly involved in the space. The third and fourth groups are intended to find out how people who are stakeholders but not users understand the value of these spaces. The users and non-users will be selected with the help of the site administration and staff.

Questions for the focus groups will be based on the previous research noted above and center on what the participants' own conceptualizations of the value and impact of their local public library's makerspaces. The PI, Co-PI, and doctoral student will develop the questions with input from the practitioner team members and will be reviewed by the advisory board. The questions will be similar to the Pew Research Center's (2016) survey on public library users where the researchers used questions about use and importance to infer the value and impact of the library on the participants. For example, impact was evaluated through survey questions that asked how the participants' lives would be affected if their library closed. Focus groups questions will be reviewed by the advisory board.

Phase 2 - Focus Groups

The focus groups would be held at a convenient time for the participants. Two facilitators will be needed for each focus group: a moderator to facilitate the discussion and an assistant moderator to take notes, trouble shoot, and keep time. PI Emily Knox, Co-PI Kyungwon Koh, and a doctoral student will share facilitation duties. Food and allowable incentives will be provided to participants. Focus groups would take approximately an hour and a half and questions would cover the following areas: 1. Personal history with the makerspace 2. Perceived goals and objectives of the makerspace 3. Use or non-use of the makerspace. By focusing on the value of makerspaces to four different audiences, the researchers will be able to triangulate their analysis in order to eventually build a robust evaluation toolkit. The use of focus groups allows researchers to guard against imposing their own meaning on these spaces.

Phase 3 - Analysis and White Paper
PI Emily Knox will have primary responsibility for analysis of the focus group transcripts and drafting the white paper. The PI, co-PI, and doctoral student will conduct the analysis after testing for inter-coder reliability. The analysis will be reviewed by the practitioner team members and the advisory board. This will help ensure the quality and credibility of the analysis and help generate findings that are relevant to the realities of public library practices. Focus group responses will be analyzed to determine appropriate variables for toolkit development. It is hoped that a framework for evaluating value and impact beyond usage and individual learning outcomes will come out of this analysis. In light of this, transcripts and notes of the focus groups will be analyzed using a grounded theory approach. As Charmaz notes, "grounded theory consists of the researcher deriving his or her analytic categories directly from the data, not from preconceived concepts or hypotheses" (Charmaz, 2001, p. 336). The terms used for describing data should come from the participants' own understandings of the phenomenon being studied.

The outcome of this pilot study will be a white paper outlining a baseline framework and factors for an evaluation toolkit. The draft white paper will be reviewed by the practitioner team members and the advisory board. The finalized version will be posted under Creative Commons Attribution-ShareALike License (CC BY-SA) to the University of Illinois Library IDEALS institutional depository. The initial analysis may also be presented at conferences and published in journals.

Focus Group Sites
The Indian Trails Public Library District (ITPLD) (Suburban, Dedicated Clean Makerspace) serves a community diverse in ethnicity, religion and culture and proudly relishes its role as a bridge between groups, and continually seeks ways to build a more cohesive community. The library serves 67,000 residents in the Wheeling, Buffalo Grove and Prospect Heights suburbs, located approximately 25 miles northwest of Chicago. The majority of residents (69 percent) in the district are white; 28 percent identify as Hispanic or Latino; and 14 percent report as Asian, Hawaiian or Pacific Islander ethnicity. While English is the main language spoken at home, 47 percent of district residents speak a language other than English at home. Forty-two percent of Wheeling residents and 31 percent of Buffalo Grove residents are foreign-born with approximately half of these residents being naturalized citizens. Eleven percent of Wheeling residents are below the poverty level, while nearly 5 percent of Buffalo Grove residents are below the poverty level.

The district's makerspace, The Launch Pad, is a space to explore, play, create and collaborate. Embark on a journey of discovery and possibility through hands-on learning where all that's needed is imagination. The 1400 square-foot Launch Pad was created as a part of the 2016-17 renovation project. It was designed to be a visible part of the first floor, symbolizing the commitment to creating a culture of making in the community. The Launch Pad also includes three rooms for media creation, learning and entertainment purposes: Sound Lab, Video Editing Lab and Archival Station. The Sound Lab features a soundproof recording booth and the Video Editing Lab has a green screen wall. One-hour appointments with staff are available when members need guidance on a specific project or to be trained on a piece of equipment. With over fifty pieces of equipment and numerous software programs, The Launch Pad is positioned to

meet every creative endeavor and spark curiosity. All ages can find something of interest to explore in the Launch Pad.
Administratively, The Launch Pad resides in the Digital and Maker Services department that is staffed by a manager, two full-time librarians, one full-time advisor and two part-time advisors. In the three years since The Launch Pad opened, additional staff were hired to meet the needs of members. The Launch Pad is open 1-8 pm M-F, 10-4 on Saturday and 1-4 on Sunday. Hours are extended during the summer.

DeKalb Public Library (Exurb, Dedicated Clean Makerspace) is situated in a community with a very diverse population in a small area. DeKalb, Illinois has a population of approximately 44,000 in an exurb of Chicago. There are people who commute into the city and suburbs for work, and others who work on active farms or in industrial settings. Adding to this diversity is the fact that DeKalb is the home of Northern Illinois University, which brings in large numbers of college students to the area. The area also draws international students and their families, which has led to a population much more diverse than surrounding communities. While DeKalb's overall population is 73% white, school-aged children are majority-minority, with 53.7% of students in our school district reporting as minority or multi-racial. Median household income is just over $41,000.

Maker programming at the DeKalb Public Library serves patrons of all ages--events designed for children under 10 are generally held in the Youth Services area of the library. Within the lab spaces, maker programming is intended for patrons over the age of 10 (a parent must accompany children 10 to 13). The library is in the process of separating making activities into three locations within the building. In addition to our Sound Studio, we are expanding the current multi-use maker space into a dedicated digital design lab and adding a hands-on creative space for programming. The Nancy D. Castle Collaboration Studio will retain the library's digital classes, while the new space will hold maker equipment, craft supplies, and be available for use as program and open studio space. The transition is expected to be complete by June 2020, and maker activities and classes will continue uninterrupted through that time.

The library's maker equipment includes several 3D printers, a 60-watt laser cutter, some vinyl cutters, sewing machines and other traditional making supplies. The Sound Studio houses equipment for recording podcasts and musical tracks along with the necessary software to edit and create sound files. The Collaboration Studio offers computer classes to help patrons get the skills needed to join in on more complicated projects in addition to digital design classes used for maker projects. Maker programming at the library is a robust mix of digital design, craft classes for all ages, cosplay workshops, and makeup tutorials to meet community requests. In 2020 we intend to bring in more genealogy and family memory preservation classes to meet our patrons' interest in the topic. Classes are often full, and staff regularly add second sessions if time allows so waitlisted patrons can participate.

The library's maker activities are constrained by staff availability—no staffing was allocated for the space when the building was expanded, so the studio has worked on changing expectations and "making do" until funding was available to add additional staff members. The department also handles the adult computer lab, so must staff desks in addition to offering programs. Recently a new department manager with a deep background in makerspaces has joined the

library's team, and a full-time staff member was added to the department. With these changes we intend to expand maker programming into the larger studio space, and to be able to offer more frequent open lab opportunities for patrons to use the maker space.

Joliet Public Library (Urban, Digital Makerspace) serves the third largest city in the State of Illinois, with two branches situated in a downtown, urban setting (Ottawa Street Branch), and a suburban neighborhood setting (Black Road Branch). Joliet Public Library began serving its community in 1876, and the Ottawa Street Branch, which houses the bustling Digital Media Studio (DMS) was designed and built by Daniel Burnham in 1903. The Black Road Branch opened on the far West side of Joliet in 2002. Joliet Public Library's population was estimated in 2018 at 150,000+ people, and the two branches serve businesses, students, educators, senior citizens, English as a Learning Language Learners, the unsheltered, parents, teenagers, adult learners, babies and toddlers, young adults and visitors from across the country. The population across Joliet's 62 square miles is 30% Latino or Hispanic, 16% African American, and 30% of the population is under the age of 18. In 2018, Joliet's per capita income was just over $40,000, with 11% of residents living below the poverty line.

The Digital Media Studio (DMS), built to focus on the needs of Joliet's small businesses and entrepreneurs, opened in 2012. The DMS serves Joliet Public Library cardholders, providing services such as digitization, photo restoration, sound/video/graphics editing, small business startup guidance, podcast development, video and audio production (with an audio booth), graphic arts instruction, website construction, script-to-screen services (e.g., storyboarding, concept discussions, etc.), a green screen for photography, poster printing, t-shirt printing and 3D printing. The DMS also offers technology and creative classes to the public on topics such as comic book illustration, photo restoration, Adobe Premier, iPhone/iPad basics and digital camera best practices. The DMS continues to evolve, through building services to the local youth population with funded Project Next Generation grants, which has brought additional technological advancements to our patrons.

The DMS was largely created through public grant funding and operates with an annual programming and technology budget of $4,000. The DMS is staffed by a professional team of five (1 FTE Supervisor and 4 PT Associates) and was the first Digital Media Studio to operate in Will County. Until September 2019, the DMS was exclusively situated in a former office space, making it one of the most functionally compact, and yet widely varying, digital media studios in the country. In September of 2019, Joliet Public Library expanded the footprint for the DMS into an adjacent former computer lab location, making it possible for the first time for the DMS to serve multiple patrons on varying interests simultaneously.

Project Team

PI Emily Knox is an associate professor at the School of Information Sciences and has primary responsibility for logistics, analysis, and writing. She is a key member of Makerspace Urbana and was an invited participant to the 2016 Nation of Makers Event at the White House. She has extensive research expertise in qualitative methods including focus groups. She received her PhD from the doctoral program at the Rutgers University School of Communication & Information. Her master's in library and information science is from the iSchool at Illinois. She also holds a BA in religious studies from Smith College and an AM in the same field from The University of

Chicago Divinity School. She is on the board of the Association for Information Science & Technology, the Freedom to Read Foundation, and the National Coalition Against Censorship.

Co-Pi Kyungwon Koh is an associate professor at the School of Information Sciences and has secondary responsibility for logistics, analysis, and writing. As an expert in the maker movement and learning and community engagement through libraries, she has served as PI for two IMLS-funded research projects on makerspaces. She earned her MS and PhD at the Florida State University's iSchool and a BS from Yonsei University Department of Library and Information Science in South Korea.

Brian Shepard, the 2019 Illinois Librarian of the Year, is the executive director of the Indian Trails Public Library District and has shaped and evaluated innovative public services throughout his career at ITPLD and at the Arlington Heights Memorial Library (IL). Most recently, he led ITPLD through an extensive library renovation that added several new library services, including a makerspace. Brian is a member of the Illinois Library Association Executive Board and received his MSLIS from the University of Illinois at Urbana-Champaign.

Ryann Uden is the deputy director of the Indian Trails Public Library District and brings experience creating digital media labs and an active learning space at the Barrington Area Library (IL). Ryann participated in the IMLS funded 2019 National Forum for Research and Assessment in Library Makerspaces presented by the University of Wisconsin-Madison and Maker Ed. Ryann received her MSLIS from the University of Illinois at Urbana-Champaign.

Jennifer Hovanec is the Digital and Maker Services manager at the Indian Trails Public Library District. She is active in regional makerspace organizations, was selected as a participant of the 2018 ALA Leadership Initiative, and also participated in the 2015 ILEAD USA. Jennifer received her MSLIS from Dominican University in River Forest, IL.

Advisory Board

Samual Abramovich, Ph.D. is the director of the Open Education Research Lab at the University at Buffalo where he is also an Associate Professor in the Department of Learning and Instruction and the Department of Information Science. His research is devoted to finding and understanding the learning opportunities and challenges of Open Education through the application of the Learning Sciences in areas like Makerspaces and Micro-credentials. Shortly after graduating from the University of Pittsburgh with a Ph.D. in Learning Science and Policy, he was named a recipient of an Edmund W. Gordon MacArthur Foundation/ETS Fellowship. Prior to earning his Ph.D., Sam was a researcher at Johns Hopkins University in Baltimore, MD, a technology coordinator for the Rashi School in Newton, MA, and a serial dot-commer.

Stephanie Chang is the Director of Impact at Maker Ed, having spent 5 years previously leading and designing Maker Ed's program and project offerings for educators and institutions around the country. Her current work focuses on evaluating the impact and value of programmatic efforts, as well as developing stories, tools, and strategies for better understanding the impact of the field at all levels. She leads related research efforts and informs the design of professional development and partnerships at Maker Ed. Prior to Maker Ed, Stephanie supported makerspaces and programs with 15 California high schools; worked in educational research and evaluation;

led the science & technology program at The Tech Museum; and taught environmental and marine science. Stephanie holds a Bachelor's in Biology from MIT and a Master's degree from the Learning, Design, and Technology program at Stanford University's Graduate School of Education.

Shannon Foster is the Makerspace Librarian at the Pitkin County Library (CO) and is inspired to engage in community collaboration, create dynamic creative spaces, and new technology to the 17,000 residents of Pitkin County (as well as visitors to the area). Shannon is the "expert" in her library at varying technology, low and high tech, and she finds it important to be proactive and embrace current trends. Shannon received her MLIS in May 2019, from Kent State University.

Richard Kong is the Director of the Skokie Public Library in Skokie, Illinois. He serves on the Board of Directors of the Skokie Chamber of Commerce and is a member of the Rotary Club of Skokie Valley. In previous positions, Richard was active in creating ground-breaking digital media labs at both the Skokie Public Library and the Arlington Heights Memorial Library. Richard is also a recognized leader in the professional library community, currently serving as an executive board member of the Public Library Association and previously as an executive board member of the Illinois Library Association. Richard received his Master of Science in Information from the University of Michigan.

Zeth Lietzau is the Director of Collections, Technology, and Strategy at the Denver Public Library (DPL). Previously he worked at DPL as the Manager of Digital User Experience and the Community Technology Center. He also served as Associate Director at the Library Research Service and has worked desks at a handful of other public libraries in Colorado. Zeth received his Master of Library and Information Science degree from the University of Denver.

Rebecca Millerjohn is the youth service librarian with the Bubbler at Madison Public Library. Rebecca is a previous six year classroom working in Houston Texas as a Teach For America Corps member and at Gary Comer College Prep on Chicago's South Side. Rebecca's library work focuses on school age programming, educator support, and maker education with MPL's Bubbler program. As the Bubbler's project manager for their Summer of Making Internship and Making Spaces initiatives, she loves sock monsters, power tools, paper circuits, and when kids get little scrunched faces that shows they are THINKING. Her current work includes community engagement with Madison educational partners, the creation of the Bubbler's Impact blog, and research into making & learning assessments and practices. Rebecca received her Masters in Library and Information Studies from the University of Wisconsin, Madison.

Rebecca Teasdale, is principal of Rebecca Teasdale & Associates, where she helps libraries build their evaluation capacity and make evidence-based decisions. Rebecca has held leadership positions in urban and suburban public libraries in Illinois and Oregon. She has evaluated projects funded by the National Science Foundation, National Institutes of Health, Institute of Museum and Library Services, and Bill and Melinda Gates Foundation in libraries, museums, afterschool programs, and universities. In August 2019, Rebecca will join the University of Illinois at Chicago as an assistant professor of educational psychology. Her research advances evaluation methodology and examines STEM learning in informal contexts. Rebecca completed

her PhD in educational psychology with specialization in evaluation methodology in March 2019. She holds an MA in library science from the University of Iowa.

Nicholos Wethington is the Making and Tinkering Programs Manager at the SpectrUm Discovery Area. Nicholos is passionate about sharing his knowledge of science with everyone, and loves making and tinkering. At spectrUM, Nick works in the museum and with partners in the Bitterroot valley and on the Flathead Reservation creating hands-on educational experiences that engage everyone's innate ability to make and create. Through these efforts, he is embedded in a number of schools co-teaching activities and helping to build the capacity of teachers and staff to incorporate the maker movement ethos into their curriculum. Nick also maintains and develops spectrUM's exhibits and IT infrastructure and coordinates outreach efforts for the Blue Mountain Observatory, University of Montana's astronomical observatory operated by the Physics and Astronomy Department. Nick received his Bachelor of Science Degree in English Literature from Iowa State University.

National Impact

To the knowledge of the project team, no previous project engaged both users and non-users to understand the impacts that public library makerspaces have on the entire community, beyond the individual user, program, or institution levels. Once completed, the immediate impact of the planning project will be deepening our understanding on the perceptions and experiences of various stakeholders regarding the value of public library makerspaces, which results in the development of a critical baseline framework. The framework will offer foundational knowledge for developing measures of the impact of library makerspaces, such as impact areas or evaluation factors—i.e., what to measure. Without such a baseline framework collected directly from and collaboratively with community members, an attempt to develop an impact measurement tool will be futile. Once the exploratory planning grant pilot project concludes successfully, the project team may pursue a full project grant to develop the actual evaluation toolkit. The framework established in this pilot itself, however, will serve as a flexible guideline and be able to be adapted by other institutions and communities to meet their own needs and purposes.
The final deliverable of the pilot project will include a white paper that presents a baseline framework and factors for evaluating the value and impact of public library makerspaces on communities. The white paper will be freely available and distributed with a Creative Commons Attribution-ShareALike License (CC BY-SA) via the University of Illinois Library IDEALS institutional depository.

The project team, who consist of university researchers and library practitioners, will widely promote the white paper to both research and practitioner communities. Findings may also be presented at conference presentations and papers. Potential conference venues include ALA, PLA, ALISE, Connected Learning Summit, and more. Potential journals include *Public Library Quarterly*, *Library Trends*, *Information and Learning Sciences*, and more. The iSchool's communications office can also ensure a wide dissemination of the final deliverables through different communication channels, such as listservs, websites, and social media. The findings may also be disseminated as a webinar either through the iSchool or partner organizations such as PLA.

As noted above, makerspaces can be found in many public libraries across the country. It is difficult to estimate how many exist, but it is clearly a growing phenomenon. In *Making + Learning in Museums and Libraries: A Practitioner's Guide and Framework* (2016), the authors note that when it comes to makerspaces "identifying success can be challenging since traditional metrics of success may be inadequate to capture the richness of maker-based learning experiences. For example, counting the number of participants in a program may not make sense since many maker programs place a greater emphasis on depth of experience" (p. 13).
This project is intended to help public libraries identify what makes a successful makerspace as not just a space of learning but also a space that increases the value and impact of public libraries on all aspects of their local communities. Ultimately, the anticipated long-term national impact of the project is the increased capacity of the public library makerspace to serve.

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Measuring the Impact and Value of Makerspaces in Public Libraries

School of Information Sciences, University of Illinois Urbana-Champaign

PI: Emily Knox

Schedule of Completion

	YEAR ONE											
	sep	oct	nov	dec	jan	feb	mar	apr	may	jun	jul	aug
PHASE I												
Recruit participants and schedule focus groups												
PHASE II												
Focus groups												
PHASE III												
Transcription												
Analysis												
Draft white paper												
Post final white paper to Illinois open access depository												

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.

The white paper will be given a Creative Commons License CC BY-SA, attribution and share alike. The paper will be available free of payment through the University of Illinois open access repository, IDEALS https://www.ideals.illinois.edu/.

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 authors of the white paper will hold the copyright and the paper will be posted to IDEALS https://www.ideals.illinois.edu/, the University of Illinois open access repository. use governed by the CC BY-SA license and will not have any access restrictions.

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 will be reviewed by the University of Illinois's Institutional Review Board. Participants will sign a consent document and their names and other identifying information will not be used in public documents.

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.

White paper will will be created using standard word processing software and will be available available in PDF.

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.

The white paper will be created in MS Word and be available in PDF, which can be read using the freely available Adobe Reader or other PDF reader software.

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.

PDF

Workflow and Asset Maintenance/Preservation

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

N/A

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).

N/A

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).

IDEALS has a Metadata policy available here: https://wiki.illinois.edu/wiki/display/IDEALS/Metadata+Policy. It uses the Dublin Core structure and has some controlled vocabulary.

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

This is part of the of the IDEALS metadata policy and uses the Open Archives Initiative Protocol for Metadata Harvesting (http://www.ideals.illinois.edu/dspace-oai/request?verb=Identify)

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).

IDEALS uses the Open Archives Initiative Protocol for Metadata Harvesting (http://www.ideals.illinois.edu/dspace-oai/request?verb=Identify)

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).

The white paper will be given a Creative Commons License CC BY-SA, attribution and share alike. The paper will be available free of payment through the University of Illinois open access repository, IDEALS https://www.ideals.illinois.edu

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.

N/A

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.

Transcripts of 12 focus groups between October 2020 - January 2021. The focus groups will be recorded in mp3 format and transcribed by a professional transcriptionist. The transcriptionist will sign a confidentiality agreement.

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?

The research activity requires IRB approval. It has not been approved. If the grant is received, University of Illinois IRB approval will be secured.

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.

Focus groups will be audio recorded and transcribed. No data is collected via email or other networked information. Focus group recordings will be kept indefinitely. For those focus group participants that choose confidentiality on their consent form, any transcripts or recordings will be kept using a code system for identification.

The written focus group notes will be maintained in a secure file cabinet. The typewritten focus group notes, audio recordings, typewritten transcripts, and digital documents will be stored on a password protected hard drive. A backup

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

For those participants that choose confidentiality, consent documents will be coded. The key will be kept in a separate secure file drawer.

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?

Focus groups will be recorded and transcribed. There will also be a note taker. No special technical requirements are necessary for the data to be understood, retrieved, displayed, or processed. The dataset (i.e., transcriptions of the focus groups) will not be publicly available.

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

The codebook will be stored on a password-protected hard drive. The documentation will not be permanently managed as the dataset will not be publicly available.

A.7 Identify where you will deposit the data:

Name of repository:

N/A

URL:

N/A

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

Every year. Periodic updates of passwords.