Massachusetts Institute of Technology – Libraries

A National Forum on principles of Accessibility and Inclusion for the Design of Library Systems

Libraries are increasingly serving diverse and widely distributed communities; curating heterogeneous collections drawn from broadly distributed sources; and facilitating discovery of massive collections. This creates substantial pressures to provide services that are accessible to communities with a range of abilities and viewpoints; and raises concerns that the algorithms, interfaces, and ontologies embedded in current library systems incorporate substantial biases.

We propose, over a twelve-month period, to convene a workshop, and to develop a report based on it, that will identify gaps, opportunities, and best practices for designing library systems that can incorporate local knowledge, accommodate different modes of learning and cognition, and foster diverse approaches to organizing information. The result will be a report recommending approaches for community software developers to guide development of open source library systems, and to engage with vendors around implementing more diverse, inclusive and accessible library information systems.

This project will be lead by Micah Altman, Director of Research, and Chris Bourg, Director of Libraries at the *Massachusetts Institute of Technology.* The advisory/program committee for the project include collaborators from a cross-section of memory-organizations and diversity-promoting organizations.

The primary project activity will be a set of workshops -- with framing activities before, and writing, commenting, review, and dissemination activities following. These major activities include an online survey of perceived gaps; creation of a bibliography and set of use cases; creation of an extended reviewer and participant database; workshop preparation logistics; workshop hosting and facilitation; drafting of the workshop report with selected key participants; dissemination of the report for public commentary and expert review; incorporation of public commentary and expert review; publication of the final report; and dissemination of summary reports through professional venues.

The primary output of the project will be a white paper summarizing the significance and areas of need for diversity and inclusion; identifying high-impact design principles that are accepted and emerging in the broader community; characterizing approaches and methods for applying these principles to library information systems; and identifying potential next steps for software developers that develop these systems and for library institutions that adopt and deploy them. We also aim to distribute, as intermediate outputs, use-case briefings and selected bibliographies prepared to frame the workshop ideas; presentations and position papers prepared by participants in the workshop; and presentations prepared by the team to disseminate the recommendations from the workshop reports.

We will evaluate the results of this project using quantitative and qualitative measures before and after the workshop, and after the release of the report draft and final report. Measures will include participant satisfaction surveys; bibliometrics; social media mentions; downloads, and media coverage.

The longer-term impact of this project will be in the influence that it has in areas of information science and cognate theories and the extent to which software developers adopt and employ the design principles. The broadest impact will be to overcome barriers to inclusiveness in library systems and thus open opportunities to to extend the global reach, local relevance, and perceived trustworthiness of libraries.

Massachusetts Institute of Technology Libraries
Proposal for a National Forum

Statement of National Need

Libraries increasingly serve diverse and widely dispersed communities; curate heterogeneous collections drawn from broadly distributed sources; and facilitate discovery of massive collections. This creates substantial pressures to provide services that are accessible to communities with a range of abilities and viewpoints [Liew 2012] and raises concerns that the algorithms, interfaces, and ontologies embedded in current library systems incorporate substantial biases [Sadler & Bourg 2015]. We propose to convene a workshop to identify gaps, opportunities, and best practices for designing library systems that can incorporate local knowledge, accommodate different modes of learning and cognition, and foster diverse approaches to organizing information. The result will be a report recommending approaches for libraries to guide development of open source library systems, and to engage with vendors around implementing more diverse, inclusive and accessible library information systems.

As the U.S. population becomes increasingly active on-line and the potential audience for library resources and tools becomes increasingly global, libraries have greater pressures and incentives to serve patron communities that are broad, diverse, and have a range of accessibility needs. However, while diversity and inclusion are core library values, current library information systems are rigid in the way that they incorporate, organize, and present information. This creates a barrier to meeting the needs of learners, to engaging emerging communities of learners, and to learners participating to the fullest extent in access to and creation of knowledge in the digital age.

Enabling library information systems to be learner-centered is challenging for three reasons: First, online access exposes libraries to learners with a wide diversity of communities, learning styles, technical capabilities, and personal abilities. Second, technologies for supporting machine-human interaction, information visualization, and information discovery developed at an unprecedented rate. Third, no universal set of principles or design methods exist that allowed libraries or library software developers to understand, evaluate, and meet the needs of these communities. This is largely because specific knowledge of community needs may be known only to local communities; general scientific expertise needed to meet these needs is distributed through a range of fields – including cognitive science, educational research, psychology, and information science; and even within these individual fields there is often little in print to guide application in practice.

It is particularly important that issues of diversity be addressed soon – since it far easier to address the needs of a local community, if appropriate dimensions of flexibility have been engineered into the system during its construction. The current field of information systems, software, and services is currently in a period of rapid change. This creates an opportunity to design flexibility into the next set generation of discovery and access tools.

Project Design

Overview

The proposed work will move library services in the United States forward to design information systems that better address needs for accessibility, diversity and inclusion. The proposed project will provide a set of principles and practices that serve as a compass for those who aim to design or acquire library systems that reflect the diverse knowledge and perspectives of their communities.

We seek IMLS funding to support the planning, preparation, and hosting of this forum, and the follow-up activities that will be required to ensure participants are well prepared to actively engage in the work required to meet the forum's goal: the forum incorporates a diverse spectrum of participants, is strongly facilitated and managed, and that the Forum's products are produced, reviewed, and published with high quality and in a timely manner.

Rationale

Diversity is a core value of libraries.[1] Traditional approaches to library diversity are exemplified by best practices such as *ACRL's* "Diversity Standards: Cultural Competency for Academic Libraries", in *ARL's* semi-annual "National Diversity in Libraries Conference" series, and in the recent *Conference on Inclusion and Diversity in Library & Information Science* series. These traditional approaches to fostering library diversity focused primarily on practices to promote diversity in staffing, on understanding the needs of a diverse set of library users, and on building individual and institutional cultural competencies that meet these needs. And, more recently, this line of traditional approaches has extended to incorporating diversity in collection development and to the role of libraries as change agents.

Over the last twenty years, libraries have increasingly adopted online digital modes for discovery, access, reference, and instruction. Overall, this has resulted in library content being available to more use and more users. However, access remains far from equitable – and there is increasing recognition of the role that design choices in information systems play in promoting diverse and inclusive access.

The proposed Forum will complement traditional conferences and standards by focusing on the role of library information systems and information architecture in supporting diverse communities to discover, access, create, and learn from library collections. And the forum will explore the potential for advancing technology to support communities of users that are not only diverse in race and ethnicity, but also in gender identity, sexual orientation, geography, ability, learning style, and neurology.

[1] For an exemplar articulation of the value of diversity see ALA's value statement: http://www.ala.org/advocacy/intfreedom/americanvalue

Research across a spectrum of fields suggests methods and design principles that have the potential to promote inclusive and equitable access to digital content:

- *Access for those with physical disabilities.* Three decades ago, in the field of architecture, Robert Mace [Mace 1988] promoted principles of "universal design" that were intended to make physical spaces and artifacts not only more accessible to those with physical disabilities, but more accessible to everyone. More recently, researchers in computer-human interaction [Vanderheiden & Treviranus 2011; Beyene 2016], in education [Cast 2011], and in library sciences [Creamer, 2007; Chadock & Dolinger 2009; Hill 2013], have begun to adapt universal design principles to digital systems. In applied work, the World Wide Web consortium's accessibility initiative has incorporated similar principles of design in developing recommendations for design of interactive systems using web technologies. [W3C 2016].
- *Access for the Global South.* The Global South contains a huge potential community of users of library content for research and education. For example, the growth of open access journals, and especially the growth of open-source systems to support such journals has resulted in the founding of thousands of open journals in or serving the Global South. [Edgar & Willinsky 2010]. Open library content and MOOC content also have potential for broader use – but face substantial challenges, among them systems that are designed with the assumptions that users will be continuously online and English-speaking. [Alcorn & Kapur 2015; Hosman 2010)
- *Access for neurodiverse learners.* There is increasing recognition in cognitive science and behavioral and health sciences of the diversity of human neurology, its effects on learning and behavior, and the needs to recognize this in libraries [Lawrence, 2013]. This change in understanding of how neurology affects learning has lead research the effectiveness of computer interface design [Dalton 2013], information visualization and delivery methods [Schneps et al. 2013; Blechner A.J. 2015; Wang et al. 2016], and online educational systems and methods [Catalano 2014; Lontin 2014] across diverse populations of learners. Surprisingly, this research is showing promise in making information systems more effective for typical learners as well. [Schneps 2015]
- *Designing for difference.* More recently researchers in the information science, sociology, and psychology have extended the theory of design principles for access to information to focus beyond the needs of specific populations. It has long been recognized that cataloging and classification systems embody social biases (Olson 2010). Weinberger (2011) has suggested the idea of designing open metadata systems and libraries as "platforms" for local communities as a counterweight to this source of bias – and other researchers have suggested general analytic for recognizing and designing for difference (Kumbier & Starkey 2016; Liew 2012); McPherson 2014). A recent line of scholarship (Bardzell 2010; Sadler & Bourg 2015; D'Ignazio & Klein 2016) has also suggested how a specific set of design principles, informed by the feminist epistemological tradition, might be applied (respectively) the design of computer interfaces, data visualizations, and library systems.
- *Applying new technologies to enrich digital, tangible, and social access.* Research on emerging technologies that enhance computer-human interaction – such as "virtual

reality" and "augmented reality" suggest that understanding how people interact with tangible objects, other people, and their own bodies can enhance learning [Dede 2009], collaboration [Rosenberg et al. 2013; Oh et al. 2016], and the intellectual and emotional quality of interactions with information [Rudd, et al. 2012]. Interestingly, although originating from a field very different from the work in designing for difference described above, this work draws on some of the same underlying principles, including embodiment. [see Wilson and Golonka 2013] Applying the design principles being uncovered in VR and AR to library systems has the potential to regain some of the lost affordances of tangible collections, and possibly to enhance serendipitous discovery [Carr 2015; Thudt & Carpendale 2012[, access, and reference.

Workplan

The project will be directed by Dr. Micah Altman, Director of Research for the MIT Libraries, and Head/Scientist for the Program on Information Science (http://informatics.mit.edu). Dr. Altman will be responsible for overall scientific design and execution of the project. Dr. Altman has authored numerous scientific papers in social and information science; has lead the development of digital repository systems and standards; and serves in leadership roles in many library and stewardship organization

The project will be co-directed by Dr. Chris Bourg, Director of Libraries at MIT, who will provide expert guidance on the identification and selection of conference participants; and will critique the white paper. (These efforts will be unpaid and should not be considered cost sharing.) As director, Dr. Bourg has responsibility for the five libraries of MIT, special collections, university archives, and has oversight of the MIT Press. Dr. Bourg holds a PhD in Sociology from Stanford University, and has written and spoken extensively on leadership and diversity, as well as the future of libraries and scholarly communication.

We propose to recruit 20-25 expert participants for a workshop, each of whom with expertise in library systems architecture and/or in accessible and inclusive design. The proposed project will build upon a range of previous research, and we aim to recruit participants with research/development expertise in at least the following areas: feminist design principles for human computer interfaces and information visualization [Bardzell 2010; D'Ignazio and Klein 2016]; Universal Design for Learning [CAST 2011]; design for global public inclusive information infrastructure [Vanderheiden 2011]; design of web accessibility standards (W3C-ARIA) [World Wide Web Consortium 2014]; and approaches to accommodating neurodiversity in information systems [Dalton 2013] The workshop will complement existing workshops such as ARL's *NDLC (nldc.info)* and IPAC's *CIDLIS* (ipac.umd.edu), which focus on building diversity within library organizations and on identifying the needs of diverse groups of information users – and we will aim to recruit organizers of these workshops, and to present a summary of workshop results there.

Inviting a broad range of expert scholars and practitioners to collaborate on these principles will provide solid direction for future research and development initiatives at MIT, and will also

provide a shared research and development road map for the broader information sciences and scholarly communications community. Such a road map will focus our work towards achieving common goals and solving shared problems for a wider community.

The project director will participate in each workshop to solicit position papers and presentation, and to facilitate ongoing discussion. We will then draft preliminary reports that identify gaps in current library systems; design principles for accessible and inclusive library systems; and emerging practices and exemplars. We will then recruit 2-4 independent expert reviewers to comment on a draft of the report, and will revise accordingly.

Planned Activities

A detailed timeline is presented in the attached *Schedule of Completion*. In this section, we present a summary of activities:

- *Identification and recruitment of participants, and site preparation.* We have begun planning to ensure that necessary logistics are in place to support it within this timeframe. This includes identification of keynote speakers, participants, workshop format and processes, venue, support services, and participant logistics for travel and lodging. The project directors are preparing proposed speaker and participant lists. These continue to be vetted by knowledgeable colleagues and with a rubric that ensures diversity, cross-cutting disciplines, diverse sectoral perspectives (corporate, nonprofit, government, university), and domain expertise. Because the event is planned to take place on the MIT campus, most required space, catering, and support services are available, but need to be reserved now to ensure availability. Proposed speakers and participants will be invited and confirmed soon so that they may make travel arrangements and that we can reserve local lodging. These tasks are being managed by the project directors and MIT Libraries staff.

- *Scaffolding for Forum.* After identifying the core participants we will make available a brief set of key readings as well as relevant bibliographies on a Web site established for the Forum. The project will also develop and distribute use case summaries -- to act as test cases for exploring ideas proposed during the Forum. The Web site will be designed to be accessible to the participants and to the wider public. We intend to publicize the topics for any and all to participate. We will be asking participants to provide questions in advance of the Forum, which will also populate this Web site. We hope this will establish the scaffolding for participants to engage in conversation before, during, and after the workshops.

  In preparation for the workshop we will design an online survey that aims to identify perceived gaps in accessibility and inclusivity of current library systems. We will disseminate the survey through mailing lists for ARL, NDSA, ALA and related organizations. Then, we will prepare background material for workshop participants summarizing the survey result; describing exemplar use cases for discussion; and

providing a concise annotated bibliography of research literature relevant to information accessibility and diversity.

- *Facilitating the Forum.* The Forum will consist of a 1.5-day workshop, to open with a thirty-minute keynote address. The keynote speaker will be selected for her/his expertise and ability to engage and energize participants as well as to raise provocative and inspiring questions. We expect keynoters to participate in the workshop. Like the workshops themselves, the keynotes will be recorded for later transcription.

  The workshop will be strongly facilitated to ensure that there is convergence to a report. We will identify facilitators who can address disagreement in constructive ways in order to end the workshop with an identified and agreed upon research agenda. In addition to invited participants, selected MIT Libraries staff members will also be included in the workshops. Staff participants will be selected with representation from different areas of the system

  The workshop proceedings will be captured on audio, and recordings will be transcribed. If some groups do not come to complete consensus, which is likely, we will then use the outcomes of the discussion and the setting of research priorities based on the expertise, record of output, and editorial communication during the white paper writing process, along with public commentary during the drafting process, to determine the priorities to be included in the draft white paper.

- *Writing***.** The proceedings' transcriptions will jump-start the writing of our white paper. The preparation of the papers will include posting the transcripts in PubPub for public comment, including participants' further elaborations and discussions of their ideas. PubPub is a new, open access publishing platform managed by the MIT Media Lab. It allows for public comment and annotation in a visible and collaborative way. The project directors and MIT Libraries staff will use social media, listservs, and word of mouth to promote the public comment period and bring as diverse a set of refinements and new ideas to bear on the challenges as possible. We will also identify and seek comment from an independent set of expert reviewers.

  The white papers preparation will also include capturing knowledge and information from the readings referenced on the Web site and those suggested by participants during the workshops. The project director will undertake this literature review and analysis.

Risks and mitigation strategies

The successful completion of the project will also depend on our ability to manage critical risks. The two salient and most critical risks are: (1) the possibility that participants may be unable to attend and (2) the possibility that our participants, for whatever reason(s), are unable to identify candidate design principles.

In order to mitigate the first risk we are developing in advance an extensive database of candidate attendees based on recommendation from the advisory committee; a review of publications in cognate fields; and an analysis of leadership/boards in key organizations that promote diversity in library, museums, and archives. We will continue to use this database to identify a core group of candidate participants that reflects diversity across descriptive communities, organizational roles, and field of expertise. We will then schedule with anchor participants to assure participants' availability. Should anyone in this core decline, we will promptly send another invitation based on the criteria by which we created a balanced matrix in the first place. We will use this database in further stages in calls for commentary and review of the workshop report.

The structure of the project has been designed largely to address the second risk, and yield a convergence to a consensus report. This approach (as detailed in section C) has several main elements: (1) A scaffolding stage in which the project team provides problem briefs for participants and engages participants in pre-workshop discussion to ensure a basis of common knowledge of the workshop terminology, concepts, and problem statements. (2) An in-person, focused, expert workshop with a small number of participants and trained facilitators. (3) A committee-based writing process in which team members will draft the reports, guided by selected experts from the workshop. (4) A public review process in which the wider community will be invited to comment and discuss the draft online. We have designed this combination of team-supported, expert, and community phases to drive the reports to completion while ensuring that their contents reflect wide input.

National Dissemination of Outcomes and Impact

The project's primary output will be a white paper identifying and characterizing design principles and approaches for supporting broad diversity and inclusion in library information systems. We anticipate that this report will summarize the significance and areas of need for diversity and inclusion; identify high-impact design principles that are accepted and emerging in the broader community; characterize approaches and methods for applying these principles to library information systems; and identify potential next steps for software developers that develop these systems and for library institutions that adopt and deploy them. We also aim to distribute, as intermediate outputs, use-case briefings and selected bibliographies prepared to frame the workshop ideas; presentations and position papers prepared by participants in the workshop; and presentations prepared by the team to disseminate the recommendations from the workshop reports.

These outputs will be directly disseminated for commentary through *PubPub* and through a dedicated project website, as described above. A high-level summary, and selected portions will be published as peer-reviewed, open-access publications. In addition, we will use social media channels; library, museum, and archive mailing lists; and presentations at professional conferences to broaden dissemination and engagement.

We will evaluate the results of this project using quantitative and qualitative measures. During the course of the project we will use participant satisfaction surveys; responses to our initial survey; and social media mentions of the project, activities and outputs to evaluate interim engagement and favorability. After publication of the draft report, we will measure the number of downloads, comments, and commenters on draft reports. The final report will be evaluated initially through measures of downloads, social media, and media coverage.

The longer-term impact of this project will be in the influence that it has in areas of information science and cognate theories (e.g. theory of human computer interfaces; information visualization; information access and discovery) and the extent to which software developers adopt and employ the design principles. Evidence for the former will include citation counts and related bibliometric analysis. The latter will be demonstrated through an increasing use of recommended features and affordances in new and existing library software systems, and measures recommended by through the forum.

We do not expect to be able to measure these long-term impacts directly during the course of the project. However, we anticipate that this forum will both draw attention to research importance of this area, and lay groundwork for the research horizons and agenda of an Initiative for Research in Information Sciences and Scholarly Communication (IRISSC) at MIT, as well as informing MIT's open-software platform developments. These synergistic efforts will contribute to sustaining the impact of the proposed project.

The broadest impact will be libraries relationships to their communities. Overcoming barriers to inclusiveness in library systems will open opportunities for libraries to both to extend the global reach of library access, and to enable libraries to serve as platforms for communities that incorporate local community knowledge and unique community points of view. Most broadly, by contributing to the systematic understanding in the field of library of information science on biases in information algorithms, interfaces, and organizational systems we aspire to increase the trust and trustworthiness that society places in libraries and library curated information.

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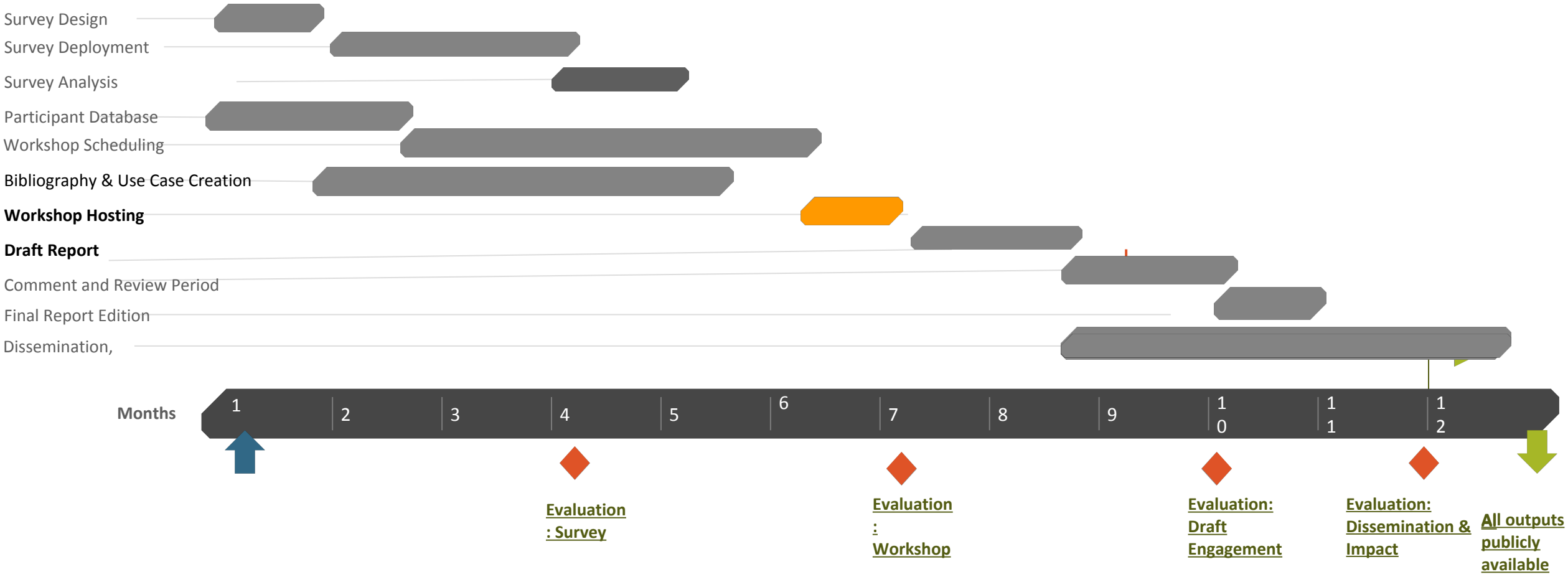

DIGITAL PRODUCT FORM

Introduction
The Institute of Museum and Library Services (IMLS) is committed to expanding public access to federally funded digital products (i.e., digital content, resources, assets, software, and datasets). The products you create with IMLS funding require careful stewardship to protect and enhance their value, and they should be freely and readily available for use and re-use by libraries, archives, museums, and the public. However, applying these principles to the development and management of digital products can be challenging. 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
You must provide answers to the questions in Part I. In addition, you must also complete at least one of the subsequent sections. If you intend to create or collect digital content, resources, or assets, complete Part II. If you intend to develop software, complete Part III. If you intend to create a dataset, complete Part IV.

PART I: Intellectual Property Rights and Permissions

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

All digital products created by the project will be available to the public under a non-restrictive license. For software we will use an OSI-approved license: originally produced works will be licensed under version 2 of the Apache license; derivative works that contain a Copyleft (e.g. GPL, CC-SA) will be licensed under the same license as the primary work from which they are derived. Text, images, and other similar works will be licensed under CC-By or CC-BY-SA, and data products will be licensed under CC-0 or ODC-ODbL.

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.

To enable sustainable development, and enable use of multiple open licenses where appropriate, we retain copyright over originally developed content. Notwithstanding, all content is irrevocably licensed to the public for use without restriction on access or use.

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.

We will collect survey data from participating experts and from a wider library community - anonymously. No culturally questions, or other questions posing non-minimal risk will be collected, and survey data will be anonymized through removal of PII before dissemination.

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

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

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

The primary digital asset planned is a workshop report. Additional digital assets may include presentations, bibliographies, case study reports, and a participant survey.

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

Surveys will be created and collecting using Survey Monkey; other outputs will be created with standard document/text editing software such as Open Office.

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

Reports will be published in PDF – using the PDF-A standard for arching. Survey data will be published in portable text formats, such as CSV.

B. Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan (i.e., how you will monitor and evaluate your workflow and products).

The reporting and survey methodology is described in the project narrative, section 2. No additional quality control is planned (or needed) with respect to the specific digital formatting/representation of these outputs

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

Outputs for the project will be shared publicly, and preserved for long-term access through deposition in the MIT institutional repository and in the Harvard Dataverse Archive.

C. Metadata

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

Dublin Core and DDI schema metadata will be created through the process of deposition in the repositories listed in B.2.

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

Metadata is versioned and preserved in the repository systems listed above. In addition, content deposited in the Datverse network is replicated at multiple institutions.

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).

The repositories above offer a number of independent API's for discovery and access, including OAI-PMH, SWORD, and Share-notifications.

D. Access and Use

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

All information will be openly available on-line using standard web browsers.

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

See for example: https://dataverse.harvard.edu/dataverse/drmaltman?widget=dataverse@drmaltman

Part III. Projects Developing Software

A. General Information

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

N/A

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

B. Technical Information

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

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

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

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

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

C. Access and Use

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

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

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

Name of publicly accessible source code repository:

URL:

Part IV: Projects Creating Datasets

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

We plan to collect survey data to identify perceived gaps in accessibility and inclusivity of current library systems and dissemination. This will be conducted on-line during the first quarter of the project, though a convenience sample of library, archive, and museum mailing lists.

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?

As an anonymous survey of non-sensitive topics this survey is minimal-risk and exempt from IRB review. Notwithstanding, we will submit the project to the IRB before start of project to confirm exempt status.

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

The survey will be designed not to include PII fields. If open-ended questions are used, manual review of responses and data-suppression (redaction) will be used to remove unintended/unexpired PII.

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

N/A

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

Data will be collected using standard on-line survey instruments (e.g. Survey Monkey). The data will be converted to a portable form (CSV) that can be analyzed by standard spreadsheet (and other tools). A copy of the survey instrument (in PDF-A form) will be preserved as documentation.

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

Codebooks will be created in PDF-A formats and deposited with the data set. Bibliographic information will be included linking the dataset to project publications. Publications will use data citations to link back to datasets.

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

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

Name of repository: *Dataverse Network*

URL: *https://dataverse.harvard.edu/dataverse/*

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

The Project Director will review the data management plan at the beginning of the project, and after data collection. A final review, including a validation of materials in the target repository will be performed in the last quarter of the project.