

## **It Takes a Village: Open Source Software Models of Collaboration & Sustainability Abstract**

LYRASIS proposes a National Forum project to convene stakeholders from open source software initiatives that serve cultural heritage organizations to explore sustainability models and produce a report that will: (1) document current practices, (2) provide paths for planning and assessment through a sustainability roadmap, and (3) offer resource allocation guidelines for each phase of a software's lifecycle. The timeframe of the project is May 2017 through April 2018, inclusive of planning, hosting, reporting, dissemination of results, and evaluation.

A significant and growing body of open source software (OSS) supports cultural heritage organizations in the collection, organization, description, preservation, dissemination, and management of content and information. Libraries, archives and museums adopt OSS as an appealing option for customization and adaptation to their own service community's needs. Granting agencies supporting the National Digital Platform prefer, and often require, that software developed be open source. Some OSS initiatives have been very successful at creating robust products, widespread adoption and engaged communities, while others have struggled to determine what strategies will work once grant funding ends or when costly upgrades are needed. A strategy that works for one community and OSS product may not work as well for another community or product. Uncertainty about sustainability hampers adoption of OSS. Building OSS that the cultural heritage community can depend upon requires continuous attention to sustainability to ensure that resources will be available at adequate levels for the software to remain viable and effective for as long as it is needed.

LYRASIS will collect background information from 20-25 cultural heritage OSS programs to document current practices. This will be compiled to inform forum discussions. Sixty program and governance leaders, community leaders (users), and technical leaders will be invited to the forum, which will be hosted in early October 2017. LYRASIS will invite diverse types of OSS to include a range of purpose, scale, and longevity, as well as a mix of stakeholders to represent the variety of perspectives and roles involved in sustainability. The forum agenda will be designed to provide input into the proposed roadmap and resource allocation guidelines, which will be drafted by LYRASIS and reviewed by forum participants prior to publication in February 2018. Free, follow-up webinars will further disseminate results of the forum, and participant evaluation will solicit recommendations for continuing the dialogue among OSS programs post-project. An Advisory Group will provide guidance in setting the agenda, leading discussions, and developing the sustainability roadmap and guidelines.

The forum and report will raise awareness of the requirements for OSS sustainability, variety of potential sustainability models, and factors that influence sustainability at various stages of a software's lifecycle. Those planning OSS will have information and models to incorporate into both initial design and ongoing management. Among current OSS adopters, stakeholder roles in sustainability will be more transparent, which can broaden community engagement with and support for the software. Potential adopters of OSS will have information to use to assess the sustainability of an OSS product prior to investing in its use. Stakeholders in diverse cultural heritage OSS initiatives will have deeper knowledge of current practices within the field and better understanding of each other's programs. Opportunities for joint projects or collaborations may emerge as OSS communities learn more about each other. The proposed sustainability roadmap and resource allocation guidelines will inform planning and encourage a long-term view, so that OSS applications are not created just to fix a problem, but rather to endure and provide functionality long into the future.

## **It Takes a Village: Open Source Software Models of Collaboration & Sustainability**

LYRASIS proposes a one-year National Forum project to convene stakeholders from open source software initiatives that serve cultural heritage organizations to elucidate characteristics and forms of sustainability models as well as factors affecting sustainability. Participants in the forum will represent a variety of cultural heritage open source initiatives at varying stages in their evolution. The forum report will: (1) document current best practices for sustaining initiatives at different phases in the software lifecycle; (2) create a sustainability roadmap to provide paths for planning and assessment of existing and new open source software; and (3) provide resource allocation guidelines for each phase of an open source software's lifecycle as exemplars of the types of investment required for success at different stages. The forum will result in recommendations to assess and strengthen sustainability for stakeholders in cultural heritage open source software. The forum also will increase communication and sharing of knowledge among diverse open source initiatives. LYRASIS requests \$100,000 from IMLS to support the national forum under the National Digital Platform project category, to support effective creation, development and expansion of open source software to advance the IMLS agency-level goal that "supports exemplary stewardship of museum and library collections and promotes the use of technology to facilitate discovery of knowledge and cultural heritage."

### **Statement of National Need**

A significant and growing body of open source software (OSS) supports cultural heritage organizations in the collection, organization, description, preservation, dissemination, and management of content and information in its many analog and digital formats. Libraries, archives and museums have come to depend upon OSS applications for integrated library systems and platforms (such as Koha, Evergreen, and Open Library Environment [OLE]); content management (Drupal, Omeka, Joomla, etc.); collections management (such as ArchivesSpace, CollectionSpace and CollectiveAccess); digital repositories (Fedora, DSpace, Islandora, Hydra, Avalon Media System, etc.); digital preservation (Archivematica, Digital Preservation Software Platform, DuraCloud, etc.); search and discovery (VuFind, Blacklight, eXtensible Catalog, etc.); and many other functions, such as Zotero for citation analysis, BitCurator for digital curation workflows, JHOVE for digital object format identification and validation, and CORAL for electronic resource management. While the license that allows for open distribution of an application may be owned by an individual or institution, the community – adopters, programmers, administrators, sponsors – is a critical factor in the sustainability of OSS. Significant resources supporting OSS come from grants, sponsors, volunteers, and organizations that contribute money and expertise to develop software and foster adoption. Grants end, volunteers shift interests, and organizational capacities change, affecting sustainability of OSS applications, in many cases limiting their ability to upgrade, adapt and grow to meet new needs in the community. Some OSS initiatives have been very successful at creating robust products with widespread adoption and engaged communities, while others have struggled to determine what strategies will work once grant funding ends or when costly upgrades are needed. Programs that are initially successful might struggle later as other projects evolve to offer new features and functionality, diverting stakeholder support. A sustainability strategy that works for one community and OSS product now may not work as well in the future or at all for another community or product. Uncertainty about sustainability hampers OSS

adoption in cultural heritage organizations. Why implement a system critical to your operation if you are not confident it will still be there, up-to-date and working well, in five or ten years? Building a national digital platform with OSS applications requires continuous attention to sustainability to ensure that commitment and resources will be available at adequate levels for the application to remain viable and effective for as long as it is needed.

There are many OSS sustainability models currently operating in the cultural heritage sector, each designed to work within specific communities and impacted by where the OSS application is in its lifecycle. One model does not fit all OSS. Initiatives choose different pathways to build community, develop the software, govern the program, manage upgrades, set priorities, foster adoption, and raise funding. This “special sauce” is a unique mix of variables that is fine tuned to the community the project serves. Aspects of an OSS’s operating model often are not obvious to those external to the initiative, including potential adopters; sometimes the model is not clear even to those using the OSS. OSS programs can be misunderstood due to jargon, lack of context, or misperception. In addition, components of the model sustaining an OSS can and do change over time as stakeholders change and the software lifecycle evolves, further increasing the potential for misperceptions. OSS projects can learn much from each other, but there is currently no means for those involved in different projects to share information about sustainability in any depth, from strengths and weakness of various approaches to challenges and opportunities. Through the national forum proposed by LYRASIS, leaders from cultural heritage OSS initiatives will share the combination of characteristics and strategies, the unique “special sauce” that makes their initiative sustainable, and discuss how the formula has changed or may change over time to meet the dynamic needs of the communities they serve. Documenting the variables, models, and approaches to sustainability in practice will foster deeper understanding of how variables work in different contexts and communities, and support stronger sustainability planning through OSS lifecycles. It also will inform both current and potential user communities about how to assess and strengthen the sustainability of the OSS products upon which they depend. As cultural heritage OSS applications reach greater maturity,<sup>1</sup> as organizational adoption rates continue to grow, and as granting agencies increasingly require that software developed be open source, the time is right to look back at what has been learned and provide shared insight to guide the field into the future.

OSS sustainability emerged as a common topic in LYRASIS’ recent Leadership Forums, a series of 12 half-day community discussions with staff from member libraries, archives and museums, funded by the Andrew W. Mellon Foundation and held throughout the U.S. between January and June 2016. While the Leadership Forums were not focused exclusively on OSS, all included discussions around members’ use of and investment in OSS applications. LYRASIS also provides educational programs for members around OSS, most recently at its October 2016 annual Member Summit. In addition to OSS-related conversations at the Leadership Forums and through educational programs, LYRASIS hosted a two-day conference specifically for OSS program managers in April 2014, also funded through a grant from the Andrew W. Mellon Foundation. The 2014 conference focused on management and community engagement for OSS within cultural heritage organizations. During follow-up to the conference, attendees uniformly

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<sup>1</sup> For example, among older library and archival OSS, the Koha integrated library system began in 1999 (<http://www.koha.org/main.asp?page=1030>), and the Fedora architecture was created in 1997 (<http://fedorarepository.org/about>).

expressed interest in meeting again. In her letter of support (Supporting Document 4), one of the attendees, Evviva Weinraub (Northwestern University), describes the 2014 conference as “one of the most useful seminars I have ever attended. As a group, we had an opportunity to discuss and work through a myriad of Open Source project designs and schemas for support and expansion. I have often sited this seminar as integral to my understanding and leadership of Open Source projects.” Events like the 2014 conference and the OSS sustainability forum proposed herein provide vital personal connections among people and programs that may not know each other, but nonetheless share similar interests, face similar challenges, and often depend upon overlapping user communities. Another recommendation emerging from the 2014 conference that has influenced the design of this national OSS sustainability forum was participants’ strong interest in a study of the governance, decision-making and community-contribution structures of cultural heritage OSS, a systematic categorization of the variety of ways that open source projects do what they do. As an early step in the Project Design below, LYRASIS plans to gather documentation about current OSS sustainability and operating models as a means of providing this systematic overview, both to inform the community and assist in structuring the discussion sessions at the forum.

While individual OSS programs may convene their own communities, and programmers often connect through Code4Lib, to the best of LYRASIS’ knowledge, there has been no other broad and inclusive convening of OSS program leadership beyond the one LYRASIS held in 2014. OSS stakeholders often engage in national organizations focused on technology, such as the Digital Library Federation (DLF) and Coalition for Networked Information (CNI), but these meetings do not focus specifically on OSS and its sustainability. IMLS support for the proposed national OSS sustainability forum will enable a group of field leaders that does not otherwise convene to meet for meaningful discussion about an issue important to all. In addition, more communication between OSS leaders will strengthen the entire community by fostering deeper understanding of both the commonalities and distinctions among their programs.

## **Project Design**

### Goal, Outcomes and Assumptions

The national OSS sustainability forum is proposed under the IMLS Content and Collections Performance Goal, to improve management of the nation’s content and collections. The proposed forum will address this by providing a roadmap and resource allocation guidelines for new and existing OSS initiatives to strengthen planning for and promote ongoing assessment of sustainability. The sustainability roadmap and guidelines will be based on learnings from the field over the past decade as well as current practices as documented by forum participants. Potential adopters of OSS applications will have a structure within which to measure sustainability and risk. OSS stakeholders will have a path to assess the health of their software and determine areas that need to be strengthened to improve sustainability. The resource allocation guidelines for each phase of an OSS application’s lifecycle will provide models of the types of resources and investment required for success at different stages. The anticipated outcome is that, using the roadmap and resource guidelines, OSS projects and programs will have sustainability strategies that include effective, ongoing evaluation of practices and long-term planning for the future. In addition, the discussions, report and webinars proposed below

will increase knowledge among OSS communities about sustainability planning and practices. Forum participants will share information about their OSS communities and learn about others, fostering deeper knowledge and greater visibility and transparency within the field. The proposed forum will have lasting impact by raising awareness of the requirements for OSS sustainability, the variety of potential models, and factors that influence sustainability at different stages of a software's lifecycle.

While libraries, archives and museums use a variety of OSS (WordPress blogs, MySQL relational databases, etc.), the forum will focus on OSS developed specifically to serve cultural heritage organizations. The project assumes that, although factors impacting sustainability may be shared across OSS, there is no single approach to sustainability. The project also assumes that sustainability strategies evolve as the OSS lifecycle progresses, technology advances, and community needs change. These assumptions will inform the forum agenda and report.

### Activities and Timeframe

The project period is May 2017 through April 2018. Steps in the plan are:

1. *Convene the Advisory Group and announce forum plans (May 2017).* The Project Co-Directors, LYRASIS staff members Laurie Arp and Michele Kimpton, will convene four additional members of the project's Advisory Group, by Skype or teleconference, in the initial month of the project. The Group will review the suggested list of OSS initiatives to invite, included in Supporting Document 1, and recommend changes as well as potential participants to invite from each initiative. Forum participants will be selected to include a mix of program and governance leaders, users from the community, and technical leaders. The Advisory Group also will review the questions proposed to gather background information from OSS initiatives (step 2) to assist in documenting practices and inform the forum agenda. Advisory Group members are listed in the Resources section below. In addition, LYRASIS will set up a webpage to provide public information about forum plans and issue a press release to announce the project widely in the library, archives and museum fields. The forum webpage will provide public information about project goals, forum plans and participants, and eventual project outputs as described below (report, webinars, etc.).
2. *Gather information from identified OSS initiatives (late May – July 2017).* Using the list of cultural heritage OSS initiatives identified by the Advisory Group above, Project Co-Directors will communicate with leaders from each to explain the purpose of the forum, ask if they would provide background information about their OSS to share through the forum and report, and indicate if representatives from their community would be available to participate in the forum. Communication will be by email and telephone. The tentative template for background information is provided in Supporting Document 2. Information collected will include such details as mission and purpose of the OSS, date of first and most recent releases, size and make-up of the community using the OSS, licensing terms, where the OSS is currently housed/hosted, size of the development community and a description of how development is managed, governance structure and roles, current sources and amounts of financial support, and investments made throughout the software's lifecycle. Content will be compiled by Project Co-Directors to highlight commonalities, distinctions, and themes for

shaping the agenda of the forum and for eventual inclusion in the project's report. LYRASIS anticipates collecting information from 20-25 cultural heritage OSS applications. All invited OSS initiatives may not be able to provide all information requested, in some cases because it may not be relevant, but Co-Directors will make every effort to collect as complete information as possible via follow-up email or phone contact. Those contributing information will have an opportunity to review and edit it prior to inclusion in the project's report.

3. *Finalize date and location (June 2017)*. LYRASIS anticipates holding the forum in early October in the greater Washington, DC, area. Nearly 75% of the organizations listed in Supporting Document 1 indicate east coast locations in their websites, suggesting likely locales of some program leaders. Stakeholder communities are national, sometimes international, in scope, so participants will come from a variety of locations, and the DC area is a relatively easy travel destination that provides a wide variety of conference facility options from which to select. The Project Co-Directors will determine actual forum dates based on advice of the Advisory Group and conversations with potential participants (step 2). Dates will be announced in early June and the forum site (conference center/facility) will be selected thereafter based on bids collected by the project's Support staff member.
4. *Issue formal invitations to the forum (early July 2017)*. LYRASIS anticipates inviting and hosting 60 program/governance leaders, community leaders (users), and technical leaders from 20-25 cultural heritage OSS initiatives. The invitation list will be determined based on Advisory Group recommendations and suggestions received in the information gathering stage (steps 1 and 2). A mix of diverse stakeholders will be sought to represent the variety of perspectives and roles involved in sustainability. Invitations will be distributed by email by the Project Co-Directors with information about the forum's purpose and goals. Responses will be managed by the project's Support staff, who will confirm attendance and provide travel arrangements as needed. Follow-up will be provided by Project Co-Directors for those not responding to initial invitations. Requests to participate from individuals not on the original invitation list will be assessed by the Project Co-Directors and some may be invited if appropriate to the agenda and if space allows.
5. *Present compiled themes from the background information collected in step 2 to the Advisory Group, finalize the agenda for the forum and invite panelists/speakers (late July - August 2017)*. Compiled and summary information from the background collected in step 2 will be shared with the Advisory Group and used to set a final agenda (see Supporting Document 3 for an outline). The final agenda will be designed to provide input and insight into the elements anticipated for inclusion in the sustainability roadmap and resource allocation guidelines in the forum report. Facilitators for breakout group discussions and speakers or panelists will be identified from among participants/invitees based on Advisory Group suggestions and responses to invitations (step 4). Co-Directors will contact breakout group facilitators and panelists/speakers (or back-ups if needed) to determine interest and availability; confirmations of roles will be made via email. Project Co-Directors also will identify a central facilitator to manage implementation of the agenda, large group discussions, and consensus-building during the forum. Bids will be sought from facilitators with experience in the cultural heritage field, preferably in areas related to technology. A formal consulting agreement will document the terms for the central facilitator, which will be

a paid position. Co-Directors will construct the final agenda for dissemination via the forum webpage and to participants via email.

6. *Monitor invitation acceptance, manage travel logistics for participants, work with panels to plan sessions, and prepare materials as needed to support forum discussions (August – September 2017).* The project Support staff will monitor responses and manage the list of participants, their travel logistics, and host site arrangements throughout the pre-forum period. Project Co-Directors will meet via conference call or Skype with each panel session team to formulate coordinated presentations. They also will meet with the forum's central facilitator and breakout group facilitators to plan discussion questions for sessions that will provide desired input to the roadmap and resource allocation guidelines. A full list of participating OSS initiatives will be posted on the LYRASIS website during this period with descriptive information about forum's agenda and panelists/speakers. Background information collected from OSS initiatives and the summary of themes will be organized by Project Co-Directors into a draft document for sharing with participants shortly before and use during the forum.
7. *Hold the forum (early October 2017).* The forum will be a 1.5 day event organized around the tentative agenda outlined in Supporting Document 3 (to be refined by the Advisory Group as noted in step 5 above). The forum will begin with an introduction by one of the Project Co-Directors and the forum's central facilitator to highlight the goals, desired outcomes, and proposed process. Potential panel session themes include governance models and processes, OSS product development pathways, community building strategies, funding streams and models at various lifecycle states, and sustainability roles/models. Each panel will be followed by facilitated breakout sessions to explore themes in greater depth. A central forum facilitator will manage implementation of the overall agenda. Advisory Group members, Project Co-Directors and/or other LYRASIS staff will facilitate breakout sessions. Each breakout session will have a self-identified recorder to take notes for reporting purposes. After the forum, participants will be asked to evaluate the event via web-based survey form, including assessment of panels/speakers, topics, materials, value, and recommendations for future activity. A link to the survey form will be included in a message of appreciation from Project Co-Directors to each participant following the forum.
8. *Report preparation (late October 2017 through February 2018).* Notes from forum sessions and background/summary information prepared for the forum will be compiled by the Project Co-Directors into a report and circulated to the Advisory Group for initial review and feedback. The report will: (1) document current best practices for sustaining initiatives at different phases in the software lifecycle; (2) provide a sustainability roadmap describing paths for planning and assessment for existing and new cultural heritage OSS; and (3) include resource allocation guidelines for each phase of an OSS's lifecycle. The best practices, roadmap and resource allocation guidelines will be based on actual experiences reported by OSS initiatives prior to the forum and recommendations from participants in the forum. Feedback from the Advisory Group will be incorporated into the final report, which will be issued in an openly accessible, web-based format by February 2018. An announcement of the report will be sent via email to all forum participants, who will be

invited to provide comments and feedback through a LYRASIS blog posting about the report. Other readers also will be invited to comment through the website/blog.

9. *Dissemination of results (February 2018 and beyond)*. In addition to the website, blog posting and participant email announcements in step 8, LYRASIS will issue a press release to cultural heritage news sources to announce the availability of the report. LYRASIS blog postings will continue to highlight aspects of the sustainability report throughout calendar year 2018. In addition, two free webinars will be hosted by the Project Co-Directors and Advisory Group members in the final months of the project to further disseminate recommendations and highlight the key outcomes of the forum. LYRASIS will promote the webinars through its website, community listservs and field media sources. Webinar participants will receive a link to an evaluative survey after each webinar to provide feedback on content and logistics. Webinars will be recorded and recordings will be posted on the LYRASIS website for open access by any interested individual post-event.

Project Co-Directors will seek opportunities to give presentations on the forum and report at national conferences in 2018, such as the Digital Library Federation, Coalition for Networked Information, American Library Association, and Society of American Archivists. Given the timing of report publication within the project period, these are likely to happen post-grant as part of ongoing LYRASIS engagement with the community. The forum report also will be included in a session at LYRASIS' Member Summit in fall 2018.

10. *Final evaluation (April 2018)*. As a final step in the project, Co-Directors will contact forum participants again in April 2018 to solicit feedback regarding the entire project. They will look for participants' assessment of value and impact over time, what they have done or changed as a result of the forum, and recommendations for the future that would build from and continue dialogue begun during the forum.

### Audience and Community Input

The primary audience for participation in the forum is stakeholders in cultural heritage OSS initiatives – community adopters/users, contributors, sponsoring organizations, governance leaders, and technical leaders. LYRASIS and the project's Advisory Group will seek diverse types of OSS to include a range of purpose, scale, and longevity. All participants in the forum will have input into the report and be part of discussions to form consensus on key characteristics and factors in sustainability.

The audience for the forum report (roadmap, allocation guidelines, and OSS current practices) is both stakeholders in OSS initiatives as described above and the broader cultural heritage community. Organizations that currently use OSS will be able to see their role in sustainability, independent of any financial or staff contributions they may be able to make toward the product. OSS stakeholders will have a method, through the roadmap and resource allocation guidelines, to assess strengths and risks within their existing sustainability plans, identify gaps or weaknesses, and investigate options for strengthening sustainability as needs and conditions change. In the broader field, organizations considering adoption of an OSS solution will have a deeper understanding of the products included in the report. They also will have a method for evaluating



strengths and risks within an OSS's sustainability model. Organizations investing in new OSS will have a template to follow in planning for sustainability from the beginning of a project.

### Risks

Any large-scale, in-person event faces risks from weather or other circumstances beyond organizational and participant control. Such factors have occasionally impacted LYRASIS events in the past, and with a first priority to ensure safety of the individuals involved, LYRASIS would reschedule the forum to another time and/or place if needed.

Colleagues of LYRASIS staff in the OSS field have expressed high interest in the forum and anticipated outputs. Should the ability of desired participants to attend on various dates selected in early October be low, LYRASIS will identify other dates that suit the majority of participants. The potential need for such a change can be determined early in the project timeframe when background information is gathered in step 2 above (May-June 2017). This would change timing of some activities in the proposed schedule, but not the planned outputs and outcomes.

### Resource Requirements

- Staff: Michele Kimpton, LYRASIS Chief Strategist, and Laurie Gemmill Arp, LYRASIS Director of Collections Services and Community Supported Software, will serve as Project Co-Directors. In that role, they will share responsibility for convening the Advisory Group, gathering background information, setting the final forum agenda, issuing invitations, working with external facilitators and speakers/panelists to plan sessions, hosting the forum, drafting and editing the final report, forum and project evaluation, managing the budget and producing reports, and communicating with participants and the cultural heritage field before, during and after the forum. Anticipated level of effort for Co-Directors is an average of 10% each over 12 months. LYRASIS Administrative Coordinator Alicia Johnson will provide support for the forum, including managing participant lists, travel logistics, site logistics, communication lists, and expense reimbursements. Anticipated support need is 10% over six months from Ms. Johnson. Résumés for Ms. Kimpton and Ms. Arp are provided in the Resumes.pdf attachment.
- The project's Advisory Group will provide advice in regard to OSS programs to include in the forum and report, background information that would be useful to collect prior to the forum, the structure and content of the final agenda, speakers/panelists and facilitators for sessions, and content of the final report. Advisory Group members also will serve as facilitators for breakout sessions during the forum. In addition to the Project Co-Directors, the Advisory Group will include four others. Supporting Document 4 includes letters of commitment from Rob Cartolano, Associate Vice President for Digital Programs and Technology Services for Columbia University Libraries; Ann Baird Whiteside, Librarian and Assistant Dean for Information Resources, Harvard University Graduate School of Design; and Katherine Skinner, Executive Director, Educopia Institute. Tom Cramer, Chief Technology Strategist and Associate Director of Digital Library Systems & Services at Stanford University, has verbally committed to serve on the Advisory Group.
- Other Financial Considerations: A facilitator will be hired to manage forum discussions and report-outs from working groups. Project Co-Directors will select a qualified facilitator based

on experience with similar events in the cultural heritage field. Anticipated need is 3 days, including 1 day of planning, 1.5 days of forum participation, and a half day of follow-up regarding outputs of discussions. In addition, the budget includes funds for: (1) travel for 70 for the forum, including 60 participants, five LYRASIS staff members (the two Co-Directors, two staff to provide support and facilitation for breakout sessions, and LYRASIS CEO Robert Miller), four Advisory Group members, and the central forum facilitator; and (2) meeting expenses related to facility rental, breaks/refreshments, and lunches. Details about these costs are provided in the Budget and Budget Justification.

### Tracking Progress and Evaluating Performance

Project Co-Directors will track progress against the cited levels of desired participation (20-25 OSS initiatives in the forum and report as well as 60 forum participants) and the attached Schedule of Completion. Forum participants will be invited to evaluate the event via a post-forum web survey as noted in step 7 above, and via an end-of-project assessment (by email or phone) as noted in step 10 above. Webinar participants also will receive evaluation forms after each session. Results from all will be compiled for sharing with IMLS. Information about report downloads and forum blog/website usage also will be gathered for reporting to IMLS.

### **National Impact**

The forum seeks to have national impact on several levels. Most broadly it will raise awareness of the requirements for OSS sustainability, the variety of potential sustainability models, and factors that influence sustainability at various stages of a software's lifecycle. Those using and/or planning OSS will have information and models to incorporate into both initial design and ongoing management. Those seeking funds for new OSS will have models and guidelines to use to develop sustainability strategies and communicate them to granting agencies and other investors. Among current OSS adopters, stakeholder roles in sustainability will be more transparent, which can broaden community engagement with, and support for, the software. Potential adopters of OSS will have a tool and information to use to assess the sustainability of an OSS product prior to investing in its use. Stakeholders in diverse cultural heritage OSS initiatives will have deeper knowledge of current practices within the field and better understanding of distinctions and shared interests among individual OSS programs/projects. Opportunities for joint projects, resource sharing, or OSS collaborations may emerge as participating communities learn more about each other. As the infrastructure of the National Digital Platform continues to grow, much of it with grant funding, components are built from OSS. Sustaining that infrastructure will require long-term community commitment and engagement. The proposed sustainability roadmap and resource allocation guidelines will inform planning and encourage a long-term view, so that OSS applications are not created just to fix a problem, but rather to endure and provide functionality long into the future.

The current isolated development of most cultural heritage OSS has resulted in little information sharing within the community about models, practices, challenges or opportunities. For example, the four OSS participants in the panel at LYRASIS' October 2016 Member Summit (ArchivesSpace, CollectionSpace, Fedora and Islandora) discovered that they knew little about the details of each other's programs or how they were managed. Stakeholders may connect

occasionally through conferences, but there has been no unified approach to communicate sustainability needs and strategies beyond individual OSS communities. The forum proposed here seeks to address this issue and provide a means to bring together many experts and diverse perspectives to shape a roadmap and guidelines that can serve all. It also seeks to address the national need to improve management of content and collections by improving sustainability of the many OSS applications used for that purpose. The proposed roadmap and resource allocation guide will provide tools to improve management of OSS. The forum method for designing these tools will improve communications and build mutual support among OSS communities around the common ground of sustainability.

As noted above, the national OSS sustainability forum is proposed under the IMLS Content and Collections Performance Goal, to improve management of the nation's content and collections. The sustainability roadmap and resource guidelines, along with the summary of current practices, are the key products anticipated from the forum. The effectiveness of the forum itself and the roadmap/guidelines will be gauged at the end of the project by a survey of forum participants (step 10 in the plan of work above). The results will be reported to IMLS with final project reports along with community feedback on the report and information about report downloads. Application of the roadmap and resource allocation guidelines cannot reasonably be measured in the timeframe of the project, since they will not be available for use until near the end of the project period. Nonetheless, the final project assessment by participants will gather information about how the report has been or may be useful to participants' programs. Wider and longer-term impact will be assessed post-project through conversations and feedback during LYRASIS' continued programmatic focus on OSS sustainability in membership forums, annual membership summits, and ongoing webinar programs. LYRASIS will track downloads of the report and assess the effectiveness of the roadmap/guidelines based on its own organizational use post-project, both for the OSS projects it manages on an ongoing basis and for evaluating potential partnerships or adoption of other OSS products into the LYRASIS portfolio. This will assist LYRASIS in updating the roadmap in the future as the OSS field evolves.

An important outcome of the forum will be deeper, community-wide knowledge about a variety of OSS programs and stronger connections among forum participants. While intangible, these can forge a future of greater transparency, visibility, and collaboration among OSS initiatives. To assess this, and its value, participants will be asked to rate their knowledge of other participating OSS initiatives either during the collection of background information or at the beginning of the forum itself. During the final project evaluation by participants (step 10 above), they will be asked to assess their knowledge of other OSS programs again, with the expectation of increased knowledge among all. Results will be reported to IMLS in combination with participant feedback about the general impact of involvement in the forum, from the value of personal connections made to useful insights gleaned regarding other OSS programs.

**It Takes a Village: Open Source Software Models of Collaboration & Sustainability  
Schedule of Completion**

| Activities  | 2017 |   |   |   |   |   |   |   | 2018 |   |   |   |
|---|------|---|---|---|---|---|---|---|------|---|---|---|
|   | M    | J | J | A | S | O | N | D | J    | F | M | A |
| Grant announced. Forum webpage created.   | ■    |   |   |   |   |   |   |   |      |   |   |   |
| Advisory Group meets: finalize forum participants; review questions to gather background information. | ■    |   |   |   |   |   |   |   |      |   |   |   |
| Form/questions for gathering background information about OSS initiatives finalized.                  | ■    |   |   |   |   |   |   |   |      |   |   |   |
| OSS initiatives contacted; background information gathered & participant availability assessed.       | ■    | ■ | ■ |   |   |   |   |   |      |   |   |   |
| Forum dates & site determined.  |      | ■ |   |   |   |   |   |   |      |   |   |   |
| Formal invitations issued to participants.  |      |   | ■ |   |   |   |   |   |      |   |   |   |
| Background information compiled for use in setting final agenda & sharing at the forum.               |      |   | ■ | ■ |   |   |   |   |      |   |   |   |
| Advisory Group meeting: set final agenda & identify panelists/speakers.                               |      |   | ■ | ■ | ■ |   |   |   |      |   |   |   |
| Invitation responses tracked; travel arrangements made.   |      |   |   | ■ | ■ | ■ |   |   |      |   |   |   |
| Forum central facilitator selected.   |      |   |   | ■ | ■ |   |   |   |      |   |   |   |
| Panel sessions planned with speakers/facilitator; discussion questions determined                     |      |   |   | ■ | ■ | ■ |   |   |      |   |   |   |
| Forum web page updated with plans   |      |   |   | ■ | ■ | ■ | ■ |   |      |   |   |   |
| Forum held (1.5 days during October 2-13)   |      |   |   |   |   |   | X |   |      |   |   |   |
| Report on forum, sustainability roadmap & resource allocation guidelines drafted                      |      |   |   |   |   | ■ | ■ | ■ |      |   |   |   |
| Advisory Group reviews draft. OSS contributors review content on their OSS programs                   |      |   |   |   |   |   |   | ■ | ■    |   |   |   |
| Report edits made; report designed & layout for publication   |      |   |   |   |   |   |   |   | ■    | ■ |   |   |
| Report published; web page updated; press release   |      |   |   |   |   |   |   |   |      | ■ |   |   |
| Webinars to disseminate results   |      |   |   |   |   |   |   |   |      |   | ■ | ■ |
| Forum participant evaluation: event in October, overall process/outputs in April                      |      |   |   |   |   | ■ |   |   |      |   |   | ■ |
| Feedback gathered on report & webinars  |      |   |   |   |   |   |   |   |      |   |   | ■ |

Project Final Performance and Financial Reports to IMLS in June/July 2018.

## 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.

*LYRASIS will hold the copyright to the final report and provide it for free use, sharing, copying, distribution, and adaptation with attribution via the current Creative Commons Attribution License at publication time (CC BY, currently 4.0) as defined at <https://creativecommons.org/licenses/>. A link to the applied license will be provided in the report. The sustainability roadmap and resource allocation guide in the report are designed for ongoing use and provided free for local adaptation.*

**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.

*LYRASIS will have no ownership rights over adaptations or uses of the report and will impose no conditions on access and 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.

*LYRASIS intends to include information gathered from forum OSS initiatives in the report. Contributors will be informed of this plan when information is requested and asked to note confidential information at the time of submission so that it may be applied only in aggregated summaries that are not OSS specific. Contributors will review and approve content to be included in the report prior to publication.*

## 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 final report on the forum will include summaries of 20-25 cultural heritage OSS initiatives, an OSS sustainability roadmap and resource allocation guide. It will be a written (textual) report.*

**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.

*The report will be created using a combination of Google docs, Microsoft Word, and/or Adobe Acrobat.*

**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).

*The report will be distributed as a PDF.*

## **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 draft of the report will be reviewed by Advisory Group members. Individual OSS contributions will be reviewed by the contributors. At least two LYRASIS staff members not involved in writing the report will serve as editors (likely the Associate Director of Marketing and Communications and the Grants Officer).*

**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).

*The report will be maintained through LYRASIS procedures for maintaining and back-up of its web content. A copy of the report also will be deposited in the Internet Archive at <https://archive.org/details/lyrasis&tab=about>, where it will have a persistent URL. The report will be maintained with organizational grant records according to LYRASIS' records retention policy (seven years following filing of the final report).*

## **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).

*Metadata for the report will follow Dublin Core standards.*

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

*Metadata will be preserved with the report as described in B.2 above.*

**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).

*LYRASIS will announce the report through press releases, listservs, blog and newsletter articles, webinars, and presentations aimed at library, archives, and museum communities.*

## **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).

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LYRISIS will produce and publish the report on organizational website and the FOSS4Lib website. The report will be deposited in the Internet Archive at <https://archive.org/details/lyrasis&tab=about>.

**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.

- FOSS4Lib (Free/Open Source Software for Libraries) <https://foss4lib.org/>
- CollectionSpace software and documentation <https://github.com/collectionspace> and <https://wiki.collectionspace.org/display/DOC/CollectionSpace+Release+Documentation>
- Disaster Prevention and Planning Resources <http://www.lyrasis.org/LYRISIS%20Digital/Pages/Preservation%20Services/Disaster%20Resources/Prevention-and-Planning.aspx>

## 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.

**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

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put. Describe the method(s) you will use and the approximate dates or intervals at which you will collect or generate it.

**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?

**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).

**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.

**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).

**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?

**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:

URL:

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