Abstract

Artstor, in collaboration with the Digital Public Library of America (DPLA) and four museums (El Paso Museum of Art, Museo de Arte de Ponce, Philadelphia Museum of Art, Staten Island Museum) seeks a $750,000 National Digital Platform Project Grant to create and implement a Web-based capacity to enable museums to contribute digital image collections to DPLA for open public access—a Museum Hub for Open Content (MHOC). DPLA has rapidly become a very significant portal to the collections of U.S. libraries, archives, and museums, but the ability of museums to contribute is limited, due not to a lack of desire but rather to technical and operational constraints, and due also to the lack of a national hub that facilitates such contributions.

Artstor is poised to build this infrastructure based on our decade-plus of experience building digital collections from heterogeneous data formats and complex rights assessments for the Artstor Digital Library, an educational resource with over 1.8 million images available to 1,600 subscribing institutions worldwide. Artstor has served as a content hub for DPLA since its launch in April 2013, channeling digitized museum content and library special collections from colleges and universities. These contributions are supported through staff intervention, which is unsustainable. The project will adapt Artstor's Shared Shelf cloud-based cataloging and asset management service to automate DPLA contribution. As a result, museums nationwide will gain access to a free-of-charge Shared Shelf Museum Hub for Open Content with three essential new functions that lower key barriers hindering museum contributions:

1. enhanced metadata tools to migrate existing data from museum systems into the contribution platform;
2. intellectual property rights decision support tools, in coordination with the work that the DPLA has undertaken, to provide contributors a means of determining which content they are comfortable contributing; and
3. a DPLA publishing capacity that maps and releases the data from the contribution tools to the harvesting server that has been established between Artstor and the DPLA.

The barriers to content contribution not only affect the DPLA's ability to strengthen its holdings from the enormous, diverse tapestry of the country's museums, it also reflects the inability of resource-constrained institutions to participate in the networked world in general. According to the American Alliance of Museums' member list, there are over 900 fine art museums and over 2,000 history museums, societies, houses, or sites in the U.S. Developing tools to support contribution to the DPLA by this significant sector will benefit the institutions as well as the public at large. This greatly increased content flow will serve library users (public and research), by sharing difficult-to-access collections on a shared national platform. We also anticipate that increased access to images of museum collections will strengthen DPLA's capacity to serve K-12 education as schools become increasingly reliant on multimedia learning materials.

The project will begin on May 1, 2015 and end on April 30, 2018, and will be carried out with three sequential releases of software service. These releases will be discussed and tested with Artstor's collaborators throughout the year, and at annual planning meetings to be held at Artstor's offices in New York City.

1. Statement of Need

Artstor (in collaboration with the Digital Public Library of America (DPLA) and four museums) seeks a $750,000 National Digital Platform Project Grant to enable museums to contribute digital image collections for aggregated and open public access—a Museum Hub for Open Content (MHOC). Today it is not easy (technologically) for museums (particularly small museums) to make their content available beyond their own site and, in many cases, impossible for them to contribute content to DPLA; the main avenue that is open to them is to contribute via a state network, and not all states have such a network. Currently there are approximately 15 state service hubs, not enough to support the thousands of museums that could contribute.

The barriers to content contribution not only affect DPLA's ability to strengthen its holdings from the enormous, diverse tapestry of the country's museums, it also reflects the inability of resource-constrained institutions to participate in the networked world in general. This museum hub would serve as a national aggregation platform for the free contribution of open content to DPLA by lowering the most significant technical and legal boundaries to the flow of such content: automating the processes for the migration of cataloging data into a contribution system; helping museums to determine the intellectual property rights associated with museum objects; and channeling content directly to DPLA.

ARTstor Inc. (Artstor), a Delaware nonprofit corporation organized in 2002, has worked with hundreds of museums and collecting institutions to aggregate high-quality digital image collections. These collections are then made available through a mix of service models, including fee-based subscriptions to the Artstor Digital Library, which channels content (including copyrighted works) to over 1,600 subscribing educational institutions, as well as free and open sites. Fees from the subscription services cross-subsidize Artstor's free and open services such as Images for Academic Publishing, which makes publishable images available on an open-access basis at no charge to any scholar for use in scholarly publications, and the ongoing maintenance of the IMLS-funded Built Works Registry (http://builtworksregistry.com/).

Artstor's President James Shulman has participated in the Content and Scope working group of DPLA since its Cambridge, Massachusetts planning meeting in February 2011. In December 2012, then newly appointed DPLA Director for Content Emily Gore was invited to participate in an Artstor museum technology advisory group meeting. Given that group's resonance with the aims of the soon-to-be launched DPLA, Artstor (working with six museums) was able to serve as one of the initial hubs for DPLA when it launched in April 2013. DPLA has rapidly become a very significant portal to the collections of U.S. libraries, archives, and museums, but the ability of museums to contribute is limited, due to the difficulty of vetting and preparing data contributions and also to the lack of a national hub that facilitates such contributions.

2. Impact

With systems and tools to facilitate the most difficult steps towards contributing to an aggregation like DPLA, museums will benefit by exposing their content broadly, and the public will benefit from the increased diversity of content represented in DPLA. Additionally, DPLA will benefit from continuing its progress toward becoming a destination for finding the country's deep troves of cultural heritage.

Artstor is poised to build this infrastructure based on our decade-plus of experience working to overcome the institutional and technological barriers to building digital collections with heterogeneous data formats and complex rights assessments.

The project will adapt Artstor's Shared Shelf cloud-based cataloging and asset management service to facilitate contribution to DPLA. Until now, Artstor has supported these contributions through staff intervention, which is neither sustainable nor efficient. As the same time, DPLA has been working to enable the increased flow of content but is also cognizant of the need to do so with limited human intervention. Providing an automated way for contributors to make contributions through software will greatly enable the flow of content and allow Artstor to support such contributions on an ongoing, free-of-charge basis.

However, those who work with museums, especially smaller and less-resourced ones, know that making available a free-of-charge software portal to open-access contribution will not, on its own, facilitate the flow of institutional content into aggregations. Migration of an institution's records from collections management systems into the contribution environment and legal review decision support tools (to help museums determine works' intellectual property rights status) are also key parts of enhancing such flow of content. For one of many examples of conference panels describing how rights analysis inhibits the ability of museums to release content, see *Know your DAM rights: Streamlining image distribution through DAM integration and copyright clearances (VRA March 2014)*[1]

The project can increase exponentially the flow of content from museums to DPLA. A typical museum contribution to Artstor has included approximately 3,000 images (approximately two-thirds of which may be public-domain images); if 500 museums use this free software service, DPLA could gain access to some 1 million new images, better representing the diversity of the country's cultural heritage. Small collecting institutions, constrained by limited technical resources, would have a pragmatic means of enabling their content to be discovered and shared. This greatly increased content flow will serve users in libraries (from public libraries to research libraries) well, by strengthening the image component of a shared national platform; these diverse and often hard-to-access image collections will provide additional context when library patrons look to DPLA for books, periodicals, and archival collections. We also anticipate that increased access to images of both art and other museum collections will strengthen DPLA's capacity to serve K-12 education as schools become increasingly reliant on multimedia learning materials.

By closely collaborating with four museums, selected for participation to represent an illustrative cross-section of cultural heritage institutions across the United States, to design and implement the project, this effort will receive the benefit of "on the ground" insights, consensus building, and buy-in from museum staff (in technology, rights and reproductions, libraries, and administrative roles) in the field. According to the American Alliance of Museums' member list, there are well over 2,000 history museums, historical societies, and historical houses or sites in the U.S.

The first set of performance indicators (tracked sequentially as the three prongs of the service are

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[1] http://vra32.sched.org/event/9a2795768013c42a91500f5dc94e2a7d#.VLczc2TF90x

tested and released) will be their availability. Since we have posited that utilization of the system may be limited until all three components are live, the key determinants of success during the three years of funding will be the design, review, and release of the service itself. The second measure of success will be to ensure that, in each stage, the service enables the flow of content into DPLA without burdening DPLA staff with the hand-crafting of data. DPLA staff should be ensuring system and content flow compatibility, not massaging contributions from the MHOC. The third measure of success will be the increasing take-up and utilization of the system. While our medium-term goal would be 500 museum contributors, we project 100 contributors making some use of the system by the third year of the project.

3. Project Design

Artstor's work done in support of DPLA thus far has been carried out by staff hand-crafted solutions using only portions of the Shared Shelf infrastructure rather than automated software tools. The project will create a free-of-charge Shared Shelf Museum Hub for Open Content with three essential new functions that lower key barriers hindering museum contributions:

1. enhanced metadata tools to migrate existing data from museum systems into the contribution platform;
2. intellectual property rights decision support tools, in coordination with the work that DPLA has undertaken to build a standardized set of content licenses, to provide contributors a means of determining which content they are comfortable contributing; and
3. a DPLA publishing capacity that maps the data and releases the content from the contribution tools directly to the harvesting server that has been established between Artstor and DPLA.

Having consulted with Mark Matienzo, Director of Technology for DPLA, we intend to ensure that the MHOC will enable data to be transferred to DPLA in ways that are consistent with DPLA's own evolving infrastructure. In particular, we would work with DPLA (and provide $40,000 in funding to DPLA to collaborate with us) to develop the following:

1. For the majority of contributors, the Dublin Core OAI protocol is likely to be the path to DPLA contribution, and for smaller museums with less capacity to catalogue and standardize their cataloging data, this will be the most realistic option. The MHOC's publishing capacity will send data to this harvesting data structure.
2. Some museums will be able to prepare their data (either legacy data or data that they enhance in the contribution software) to take advantage of the DPLA Metadata Application Profile (MAP) which has the capacity to store (and make available) considerably richer metadata, including 15-field Dublin Core (DC) with the addition of DC terms and types. The MHOC will also enable the publishing of this richer schema; for those institutions that seek to re-capture data from DPLA, via their JSON-LD API, the hub can channel these enriched data back to the contributor.
3. Finally, as an active member of the community building and deploying the International Image Interoperability Framework (IIIF), we are prepared to utilize IIIF to store and make available images to DPLA, thereby allowing users to gain access to

the larger image file without DPLA's having to harvest a media asset.

We are confident that we will be able to continue to evolve with further infrastructure development that DPLA may make during the course of the grant, since we are working to ensure two-way compatibility with Hydra developments during the course of Shared Shelf's deployment on campuses.

Our work with the four collaborating cultural heritage organizations and DPLA will start with a kick-off meeting in June 2015 to discuss roles, expectations, the schedule, opportunities, and performance indicators and targets. The museums represent a diversity of sizes, audiences served, and technological capacity. Three were the beneficiaries of objects from The Kress Collection, which was donated to scores of regional and academic art museums throughout the U.S. between 1929 and 1961, with the single largest donation reserved for the National Gallery of Art in Washington, D.C. Artstor has worked with the Kress museums to digitally re-connect images of the long-dispersed collection (available openly at www.kressfoundation.org and hosted by Artstor). We invited them to participate based on their expressions of interest when invited by Kress's president, Max Marmor, to contribute images of their Kress objects to DPLA. The Philadelphia Museum of Art was invited to represent larger institutions, and based on our longstanding collaboration with many departments across the institution, including the library and education departments. We believe that working with their education department (which works with over 2,000 K-12 teachers in the Philadelphia and southern New Jersey regions) will provide a particularly good test case for utilizing the museum content in DPLA in conjunction with schools. Moreover, because less than 20 of the country's largest museums will be of sufficient size to serve as a DPLA on the own, it will be valuable to have one larger more technologically sophisticated museum partner testing the system. It won't only be small museums that need a channel to DPLA.

While the three major components of the project will be released annually, work with the cultural heritage organizations will primarily be carried out at the beginning of the project (where discovery of use cases will be worked through) and during the pre-release testing of the service as each functionality is released to the public. Each of the museums is committed to participation in all required meetings, scoping out workflow, testing and implementing the tools throughout the three-year project, and ultimately contributing to DPLA.

Preliminary work in support of this project includes:
- Development of the Shared Shelf cataloging and asset management system. The software, network security, and hardware infrastructure supporting it are in place and being used by approximately 120 institutions, representing a very significant foundational infrastructure.
- Previous experience channeling content from museums and library special collections to DPLA.
- Consultation with Artstor's Museum Technology Advisory Group about museums' need for a "data agent" service to support the networking of their content (membership of committee in Supporting Document 1).
- 13 years of work with museum collection managers, registrars, and rights and reproductions staff concerning the issues associated with contributing content;

- Participation in DPLA Content and Scope committee meetings; appearance (with Emily Gore) on panel *Museums and the Digital Public Library of America* in *Building the DPLA and the Power of Open LAM Data* at the Museum Computer Network 2013;
- Preliminary needs analysis of intellectual property estimation tools, growing out of a Museum Computer Network session (2013) on *Minimal Frication, Maximal Use: Optimizing Open Access Image Delivery*."
- James Shulman publication on *Sustainable Free: Lessons Learned from the Launch of a Free Service Supporting Publishing in Art History* (http://liber.library.uu.nl/index.php/lq/article/view/9587);
- Development of AVES, a data migration tool used to map native legacy data into XML transport files, mapped into a Shared Shelf In and Out scheme (SSIO); and
- Channeling image and video content from 6 museums and 5 colleges and universities (Bryn Mawr College, Cornell University, University of California – San Diego, University of Delaware, and Washington University) to DPLA.

Diversity Plan

Large museums have far stronger technical capacities than smaller museums. Some – like the Getty – are both large enough and have robust enough technology infrastructure to become DPLA hubs on their own. But the vast majority of museum and collecting organizations have little or no capacity to make digital versions of their collections discoverable. By offering a free-of-charge service with some supporting tools to lower the barriers that inhibit contribution, we believe the project can serve a broad diversity of U.S. collecting institutions. As the MHOC develops, we would work to ensure that the diversity of institutions participating represented ethnically and economically diverse communities as well.

4. Project Resources: Personnel, Time, Budget

The project will draw expertise, effort, and resources from Artstor, the four collaborating museums, and DPLA. The Project Director –James Shulman, president of Artstor – is responsible for the development of communication modalities and pathways to keep participants and stakeholders informed, engaged, and responsive over the three-year period.

Additional participating key project staff members from Artstor are William Ying, Vice President of Technology; Vera Zlatarski, General Counsel; William Groppe, Senior Software Engineer; Jonathan Harris, Senior Software Developer; Charles Zeng, Senior Java Developer; Megan Marler, Director of Strategic Services; Ian McDermott, Collection Development Manager; YuJen Lu, Quality Assurance Director; Caspar Lam, Assistant Director of Design and Digital Strategy; Myka Carroll, Director of International Outreach & Development Officer; and Lisa Gavell, Metadata Manager. The key project staff who will serve to coordinate efforts at the four museums that will work with Artstor to determine system requirements, review specifications, and test the contribution service are Michelle Villa, Registrar of El Paso Museum of Art (Texas); Alejandra Peña Gutiérrez, Executive Director of Museo de Arte de Ponce (Puerto Rico); Audrey Malachowsky, Collections Manager/Registrar at Staten Island Museum (New York); and William Weinstein, John H. McFadden and Lisa D. Kabnick Director of Information and Interpretive Technologies, Philadelphia Museum of Art (Pennsylvania). Key staff at DPLA

will be Dan Cohen, its Founding Executive Director. Robert Clarida, a partner at law firm Reitler Kailas & Rosenblatt LLC, will provide advice on the development of the rights analysis tools.

The project will begin on May 1, 2015 and end on April 30, 2018, and will be carried out with three annual sequential releases of software service. Artstor's Shared Shelf software has a robust capacity to catalog, manage and publish assets to various external environments. Work would begin on May 1, 2105 to enhance the existing software with the capacity to publish specifically to the DPLA harvesting platform, including providing the capacity for contributors to declare the works to be public domain and accept DPLA terms associated with the submission of metadata, map source metadata to DPLA's data model, provide rights statements, and then publish to DPLA. We project that this functionality will be completed by April 30, 2016.

Beginning October 1, 2015, Artstor and the cultural heritage institutions will collaborate to specify enhancements to AVES, a data migration program that Artstor will adapt to enable museums to transfer their data from a variety of metadata schemas. In addition, to test the migration software on the systems at place at the participating institutions, we would collaborate with leading providers of collection management software to ensure as much systematic compatibility as practical. The anticipated deployment date for the data migration tools is April 2017.

Concurrently with the development of AVES migration enhancement, we will begin creating specifications for the rights analysis support tools. We will hold a project launch meeting with our museum partners in June 2015 to discuss content contributions and to collaborate on the workflow, wireframes, and design of the legal review tools, and obtain the advice of outside counsel in this connection, with software development work beginning December 1, 2016 and deployment of the rights analysis support tools in May 2018.

As the three different stages of development are released in a production capacity, wider circles of cultural heritage institutions will be invited to test the service (and utilize it to the extent that it is ready). While full deployment isn't anticipated until the end of the grant period, it is our plan to have elements of the system ready to be utilized one year after the awarding of the grant in response to growing museum interest in sharing their content via an open national platform. Because the migration and intellectual property assessment tools will not be ready by then, initial content and usage will be more likely to come from greater-resourced institutions, but this will begin to establish the viability and utility of the service. Outreach and promotion of the service will be the focus of the final phase, from January 2018 until the conclusion of the project with the open release of the software by April 30, 2018.

For each participating organization, full-time staff will be assigned to the project and are accounted for in the project budget; for each Artstor staff member, a percent of annual effort toward special projects is part of articulated job responsibilities and annual organizational and individual goals.

5. Communication Plan

The project's communication plan is aimed at reaching U.S. cultural heritage institutions of varying sizes, audiences served, and technological capacity, as well as others in the museum, technology, library, and visual resources communities.

A major channel for raising awareness of and providing information about the project will be the professional conferences that serve these groups, including Museum Computer Network (MCN), Museums and the Web (MW), American Alliance of Museums (AAM), Art Libraries Society of North America (ARLIS/NA), Visual Resources Association (VRA), American Library Association (ALA), and Coalition for Networked Information (CNI), among others. Artstor and DPLA staff members will present at such conferences, serve on leadership committees, and propose project briefings at annual national meetings. For example, Artstor's work with DPLA as a content hub has been presented at conferences such as ARLIS/NA 2014, VRA 2013, and Digital Maryland 2014, leading to increasing awareness and community interest in participating in DPLA. Artstor is an active exhibitor at these conferences, where new connections are established with contribution and subscription partners.

The collaborative nature of this project opens the possibility to publish a white paper and articles in journals including *Museum Management and Curatorship, Visual Resources: An International Journal of Documentation, Art Documentation,* and others in the related and overlapping fields mentioned above. By establishing a network with cultural heritage institutions wherein digitized primary source materials are continually being made available on the open Web, the conversation around this endless pool of content will be dramatically widened.

In addition to conference presentations and scholarly publications, a variety of online and print outlets will be leveraged to raise awareness of the project throughout development, and to encourage community participation in the project on launch. Communication vehicles for such announcements and reports will include:

· News releases – Artstor will disseminate news releases marking milestone events (such as grant award, the progress in the collaboration with cultural heritage institutions, and launch announcements) and post news releases to its website and blog;

· Email distribution lists –DPLA network announcements will be distributed through Artstor's monthly email newsletter, which reaches more than 100,000 scholars, students, and librarians; and

· Published reports of project progress will be made available through the Artstor, DPLA, and collaborating institutions' websites.

Project information will also be supplied to IMLS for posting to its communication portals, including IMLS project profiles and the IMLS Primary Source e-Newsletter.

In addition, community building and audience engagement will be facilitated through annual mid-year meetings in which participating museums will meet to review and discuss software developments as well as their progress in preparing museum data. Summaries of these meetings will be posted on the Artstor blog. Once the MHOC is active, Artstor will also organize special

events around relevant conferences (MCN, AAM, Museums and Web) to both publicize the project and attract additional contributors.

Audience engagement will be measured through the number of museums contributing to the MHOC and the number of images contributed, in total and by each museum. These data will be widely disseminated via the aforementioned outlets.

The following staff will be responsible for outreach, promotion and dissemination of project materials: James Shulman (President), Myka Carroll (Director of International Outreach & Development Officer), Megan Marler (Director of Strategic Services), Ian McDermott (Collection Development Manager), and Giovanni Garcia-Fenech (Communications Manager).

6. Sustainability

Ten years after the Artstor Digital Library became available as a subscription service, more than 1,620 colleges, universities, and schools in approximately 50 countries subscribe to the service. Approximately one hundred twenty institutions currently subscribe to Shared Shelf. Over 1,800,000 images are live in the Artstor Digital Library, and approximately 35,000 images from 12 institutions are available at no charge for scholarly publication via Images for Academic Publication. Shared Shelf subscribers have launched over 100,000 images and video files of their own to the publicly available Shared Shelf Commons website, most of which now have also been made available through DPLA.
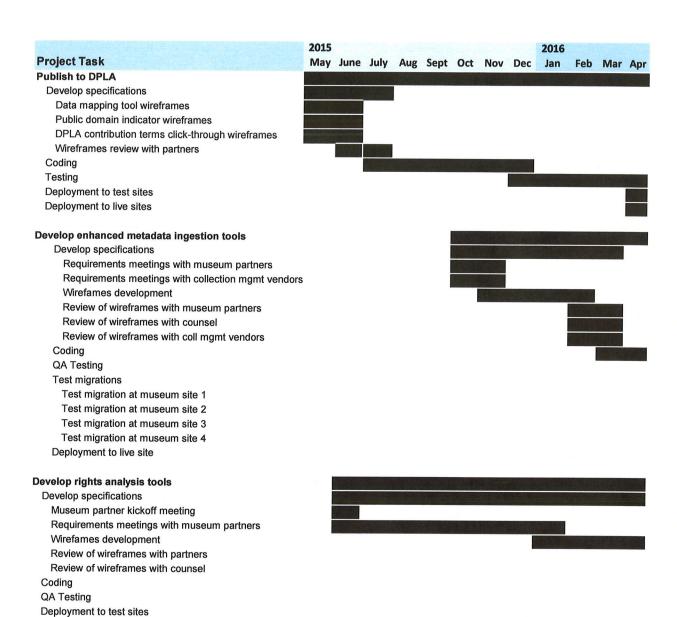
The Built Works Registry (BWR), launched as a live, free-of-charge service in 2014, was created by an IMLS National Leadership Award (made to The Avery Library at Columbia, the Getty Research Institute, and Artstor). The BWR (a shared compilation of records that catalog and assign a unique ID to particular built works) is made publically available via an OMEKA site populated from data maintainable in Shared Shelf. Shared Shelf (as a fee-generating service) provides technological support for cataloging services (as it does for BWR), but it also provides image management and image publishing services that allow campuses, museums and libraries to manage a wide range of image, audio, video and text collections, catalog them in whatever way is appropriate for the particular project, and then to make use of the content in a wide-range of environments. Colleges, universities, schools, museums, and other institutions pay for the value they receive in the full range of services that Shared Shelf provides.

Like the BWR, this project will also live symbiotically on the Shared Shelf infrastructure. In the same way that the BWR will provide open access to contributors of new built works records (and the OMEKA site will provide open access to those cataloging records), this project will allow free contributions of content to flow, via Shared Shelf, to DPLA, while not providing contributors or end users with access to a partial, but core, set of Shared Shelf's functionality.

Museums are beginning to subscribe to Shared Shelf for managing their digital assets; this is happening both in museums that are managing archival collections (history of the museum, documentation of museum events and staff, documentation of museum exhibitions) and for the management of images of works in the collection. In order to ensure the sustainability of this project as a free and open mechanism for ongoing contributions to DPLA, the contribution

capacity will be separated from the other asset management services that Shared Shelf provides on a fee basis. In this mixed model, the services supported by this grant will be provided on a no-fee basis, but access to other, distinctly different additional services (of value to subscribing institutions) will continue to be offered on a subscription basis. To be clear: no institution seeking to use MHOC to contribute content to DPLA will have to pay any fee for that service or be under any obligation to license additional services from Artstor.

In addition, although the success of the project will result in a dramatic increase in the availability of openly accessible images online, Shared Shelf and the Artstor Digital Library subscription services will continue to be in a position to subsidize the MHOC by continuing to provide subscription-based access to an aggregation of content that includes copyrighted photography and photography of works under copyright, along with specific software functionality directed at teaching and learning needs. By supporting cultural heritage organizations' desire to share content openly when possible, Artstor's overall role as a value-adding node in a networked environment will be strengthened, supporting its educational mission and bolstering its capacity to support the MHOC on an ongoing basis.

Project Task	2015 May	June	July	Aug	Sept	Oct	Nov	Dec	2016 Jan	Feb	Mar	Apr
Publish to DPLA	█	█	█	█	█	█	█	█	█	█	█	█
Develop specifications	█	█										
Data mapping tool wireframes	█	█										
Public domain indicator wireframes	█	█										
DPLA contribution terms click-through wireframes	█	█										
Wireframes review with partners		█	█									
Coding			█	█	█	█	█					
Testing								█	█	█		
Deployment to test sites											█	
Deployment to live sites												█
Develop enhanced metadata ingestion tools						█	█	█	█	█	█	
Develop specifications						█	█	█	█	█		
Requirements meetings with museum partners						█						
Requirements meetings with collection mgmt vendors						█						
Wireframes development							█	█				
Review of wireframes with museum partners									█	█		
Review of wireframes with counsel									█	█		
Review of wireframes with coll mgmt vendors									█	█		
Coding										█		
QA Testing												
Test migrations												
Test migration at museum site 1												
Test migration at museum site 2												
Test migration at museum site 3												
Test migration at museum site 4												
Deployment to live site												
Develop rights analysis tools		█	█	█	█	█	█	█	█	█	█	█
Develop specifications		█	█	█	█	█	█	█	█	█	█	
Museum partner kickoff meeting		█										
Requirements meetings with museum partners		█	█	█	█	█	█	█	█	█		
Wireframes development										█	█	
Review of wireframes with partners												
Review of wireframes with counsel												
Coding												
QA Testing												
Deployment to test sites												
Deployment to live sites												
Outreach and promotion												
Develop marketing materials												
Develop training materials												
Develop and deploy email campaign												
Convene beta testers for feedback; testimonials												

Project Task	2016								2017			
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Publish to DPLA	█	█	█	█	█	█	█	█	█	█	█	█
Develop specifications												
Data mapping tool wireframes												
Public domain indicator wireframes												
DPLA contribution terms click-through wireframes												
Wireframes review with partners												
Coding												
Testing												
Deployment to test sites												
Deployment to live sites												
Develop enhanced metadata ingestion tools	█	█	█	█	█	█	█	█	█	█	█	█
Develop specifications												
Requirements meetings with museum partners												
Requirements meetings with collection mgmt vendors												
Wirefames development												
Review of wireframes with museum partners												
Review of wireframes with counsel												
Review of wireframes with coll mgmt vendors												
Coding	█	█	█									
QA Testing		█	█	█	█							
Test migrations					█	█	█	█				
Test migration at museum site 1					█	█	█					
Test migration at museum site 2							█	█	█			
Test migration at museum site 3								█	█	█	█	
Test migration at museum site 4										█	█	█
Deployment to live site												█
Develop rights analysis tools	█	█	█	█	█	█	█	█	█	█	█	█
Develop specifications	█	█	█	█	█	█	█					
Museum partner kickoff meeting												
Requirements meetings with museum partners												
Wirefames development	█	█	█									
Review of wireframes with partners		█	█	█	█	█	█					
Review of wireframes with counsel		█	█	█	█	█	█					
Coding							█	█	█	█	█	█
QA Testing												
Deployment to test sites												
Deployment to live sites												
Outreach and promotion												
Develop marketing materials												
Develop training materials												
Develop and deploy email campaign												
Convene beta testers for feedback; testimonials												

Project Task	2017								2018			
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr

Publish to DPLA
  Develop specifications
    Data mapping tool wireframes
    Public domain indicator wireframes
    DPLA contribution terms click-through wireframes
    Wireframes review with partners
  Coding
  Testing
  Deployment to test sites
  Deployment to live sites

Develop enhanced metadata ingestion tools
  Develop specifications
    Requirements meetings with museum partners
    Requirements meetings with collection mgmt vendors
    Wirefames development
    Review of wireframes with museum partners
    Review of wireframes with counsel
    Review of wireframes with coll mgmt vendors
  Coding
  QA Testing
  Test migrations
    Test migration at museum site 1
    Test migration at museum site 2
    Test migration at museum site 3
    Test migration at museum site 4
  Deployment to live site

Develop rights analysis tools
  Develop specifications
    Museum partner kickoff meeting
    Requirements meetings with museum partners
    Wirefames development
    Review of wireframes with partners
    Review of wireframes with counsel
  Coding
  QA Testing
  Deployment to test sites
  Deployment to live sites

Outreach and promotion
  Develop marketing materials
  Develop training materials
  Develop and deploy email campaign
  Convene beta testers for feedback; testimonials

DIGITAL STEWARDSHIP SUPPLEMENTARY INFORMATION FORM

Introduction:
IMLS is committed to expanding public access to IMLS-funded research, data and other digital products: the assets you create with IMLS funding require careful stewardship to protect and enhance their value. They should be freely and readily available for use and re-use by libraries, archives, museums and the public. Applying these principles to the development of digital products is not straightforward; because technology is dynamic and because we do not want to inhibit innovation, IMLS does not want to prescribe set standards and best practices that would certainly become quickly outdated. Instead, IMLS defines the outcomes your projects should achieve in a series of questions; your answers are used by IMLS staff and by expert peer reviewers to evaluate your proposal; and they will play a critical role in determining whether your grant will be funded. Together, your answers will comprise the basis for a work plan for your project, as they will address all the major components of the development process.

Instructions:
If you propose to create any type of digital product as part of your proposal, you must complete this form. IMLS defines digital products very broadly. If you are developing anything through the use of information technology – e.g., digital collections, web resources, metadata, software, data– you should assume that you need to complete this form.

Please indicate which of the following digital products you will create or collect during your project.
Check all that apply:

Every proposal creating a digital product should complete …	Part I
If your project will create or collect …	**Then you should complete …**
☐ Digital content	Part II
☐ New software tools or applications	Part III
☐ A digital research dataset	Part IV

PART I.

A. Copyright and Intellectual Property Rights

We expect applicants to make federally funded work products widely available and usable through strategies such as publishing in open-access journals, depositing works in institutional or discipline-based repositories, and using non-restrictive licenses such as a Creative Commons license.

A.1 What will be the copyright or intellectual property status of the content you intend to create? Will you assign a Creative Commons license to the content? If so, which license will it be? http://us.creativecommons.org/

A.2 What ownership rights will your organization assert over the new digital content, and what conditions will you impose on access and use? Explain any terms of access and conditions of use, why they are justifiable, and how you will notify potential users of the digital resources.

A.3 Will you create any content or products which may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities? If so, please describe the issues and how you plan to address them.

Part II: Projects Creating Digital Content

A. Creating New Digital Content

A.1 Describe the digital content you will create and the quantities of each type and format you will use.

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

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

B. Digital Workflow and Asset Maintenance/Preservation

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

B.2 Describe your plan for preserving and maintaining digital assets during and after the grant period (e.g., storage systems, shared repositories, technical documentation, migration planning, commitment of organizational funding for these purposes). Please note: Storage and publication after the end of the grant period may be an allowable cost.

C. Metadata

C.1 Describe how you will produce metadata (e.g., technical, descriptive, administrative, preservation). 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).

C.2 Explain your strategy for preserving and maintaining metadata created and/or collected during your project and after the grant period.

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content created during your project (e.g., an Advanced Programming Interface, contributions to the DPLA or other support to allow batch queries and retrieval of metadata).

D. Access and Use

D.1 Describe how you will make the digital content 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).

D.2 Provide URL(s) for any examples of previous digital collections or content your organization has created.

Part III. Projects Creating New Software Tools or Applications

A. General Information

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

A.2 List other existing digital tools that wholly or partially perform the same functions, and explain how the tool or system you will create is different.

B. Technical Information

B.1 List the programming languages, platforms, software, or other applications you will use to create your new digital content.

B.2 Describe how the intended software or system will extend or interoperate with other existing software applications or systems.

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

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

B.5 Provide URL(s) for examples of any previous software tools or systems your organization has created.

C. <u>Access and Use</u>

C.1 We expect applicants seeking federal funds for software or system development to develop and release these products as open source software. What ownership rights will your organization assert over the new software or system, and what conditions will you impose on the access and use of this product? Explain any terms of access and conditions of use, why these terms or conditions are justifiable, and how you will notify potential users of the software or system.

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

Part IV. Projects Creating Research Data

1. Summarize the intended purpose of the research, the type of data to be collected or generated, the method for collection or generation, the approximate dates or frequency when the data will be generated or collected, and the intended use of the data collected.

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

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

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.

5. What 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).

6. What documentation will you capture or create along with the dataset(s)? What standards or schema will you use? 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?

7. What is the plan for archiving, managing, and disseminating data after the completion of research activity?

8. Identify where you will be publicly depositing dataset(s):

Name of repository: _____

URL: _____

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

Original Preliminary Proposal

Artstor (in collaboration with the Digital Public Library of America (DPLA) and a set of four regional museums) seeks a $750,000 National Digital Platform Project Grant to create and implement software to enable museums to contribute digital image collections for open public access. Today it is not easy for museums (particularly small museums) to contribute content to DPLA; lowering the three most significant technical barriers to doing so will create a museum hub for the DPLA. Such a hub will help museums by enabling them to expose their content broadly and help to build the diversity of content represented in DPLA or other national digital content platforms.

Artstor, a nonprofit organization founded in 2001, has worked with hundreds of museums and collecting institutions to make high quality digital image collections available through a range of channels: The Artstor Digital Library (which channels content, including copyrighted works to over 1,500 subscribing educational institutions); Images for Academic Publication (which makes publishable images on an open access basis for no cost to any scholar for use in scholarly publications); as one of the initial hubs for the DPLA when it launched in April 2013.

The project seeks to adapt Shared Shelf's cataloging and asset management service to create a free to use mechanism for museum contributions to the DPLA. Artstor's work done in support of DPLA thus far has been carried out by staff rather than via automated software tools. Three essential new functions will be developed to lower barriers that have been identified as hindering museum contributions:

1. Enhanced metadata tools to migrate existing data from museum systems into the contribution platform;
2. Intellectual property rights decision support tools, in coordination with the work that the DPLA has undertaken, to provide contributors a means of determining which content they are comfortable contributing; and
3. a DPLA publishing capacity that maps the data and releases the content from the contribution tools directly to the harvesting server that has been established between Artstor and the DPLA.

With such a capacity developed, tested in partnership with our collaborating museums, and deployed, hundreds or even thousands of museums will be able to efficiently channel their digitized content to the DPLA.

Project Director and Partners

The Project Director will be James Shulman, president of Artstor. Additional participating Artstor staff members are William Ying, Vice President of Technology; Megan Marler, Director of Strategic Services; Ian McDermott, Collection Development Manager; and Myka Carroll, Director of International Outreach & Development Officer.

Participants (who will serve to coordinate efforts at four museums that will work with Artstor to determine system requirements, review specifications, and test the contribution service) include

- Michelle Villa, Registrar of El Paso Museum of Art (Texas);
- Alejandra Peña Gutiérrez, Executive Director of Museo de Arte de Ponce (Puerto Rico);
- Sarah Lees, Ruth G. Hardman Curator of European Art at Philbrook Museum of Art (Tulsa, Oklahoma); and
- Audrey Malachowsky, Collections Manager/Registrar at Staten Island Museum (New York).

Proposed work plan

The project will begin on May 1, 2015 and end on April 30, 2017, with the official release of the open software service. Artstor's Shared Shelf software has a robust capacity to catalog, manage and publish assets to various external environments. Work would begin on May 1 to enhance the existing software with the capacity to publish specifically to the DPLA harvesting platform, including providing the capacity for contributors to declare the works to be public domain and accept DPLA contribution terms,

map source metadata to DPLA's data model, provide rights statements, and then to publish to DPLA. We estimate that this functionality will be completed by December 31, 2015.

Concurrently with the development of the DPLA publishing tool, in May 2015 we will begin creating specifications for the rights analysis tools. We will hold a project launch meeting with our museum partners in June 2015 to discuss content contributions and to collaborate on the workflow, wireframes, and design of the legal review tools, with development work beginning October 1, 2015 and deployment of the rights analysis tools in May 2016.

From October 1, 2015 Artstor and the museum partners will collaborate to specify enhancements to AVES, a data migration program that Artstor will adapt to enable museums to transfer their data from a variety of metadata schemes. In addition to test migrating the migration software on the systems at place at the four partner museums, we would collaborate with leading providers of collection management software to ensure as much systematic compatibility as can be achieved. The anticipated deployment date for the data migration tools is December 2016. Outreach and promotion of the service will be the focus of the final phase from January 2017 until the conclusion of the project with the open release of the software on April 30, 2017. As the three different stages of development are released in a production capacity, wider circles of museums will be invited to test the service (and utilize it to the extent that it is ready). While full deployment isn't anticipated until the end of the grant period, it is entirely possible that they system could be utilized sooner in response to growing museum interest in sharing their content via an open national platform.

Relevance to one of the three funding priorities
Museums increasingly want to share their collections but face challenges in doing so because of the resources required to create, maintain, and migrate metadata and the complexities of intellectual property rights issues. This service will dramatically lower barriers and disincentives to sharing museum-based media assets with the public, increase the visibility and discoverability of museum collections worldwide, and provide an efficient, scalable way to grow the content available via the DPLA and other networked digital initiatives.

Potential impact
The flow of content from museums to the DPLA may increase exponentially. Based on Artstor's experience of a typical museum contribution of approximately 3,000 images (two-thirds of which are often public domain images), if 500 museums use this free software service, the DPLA could gain access to at least 1 million new images, representing the diversity of the country's cultural heritage. Small collecting institutions, constrained by limited technical resources, will have a pragmatic means of enabling their content to be discovered and shared. This greatly increased content flow will serve users in libraries (ranging from public libraries to research libraries) well, by strengthening the image component of a shared national platform; these diverse (and hard to access) image collections will provide additional context when library patrons look to DPLA for books, periodicals, and archival collections.

Projected performance goals and outcomes
The project's goal is to deliver a robust open contribution network that allows museums to make their collections available via the DPLA and other aggregations.

Estimated budget
The estimated project budget of $1.5 million reflects two years of collaboration between Artstor and the museums to deliver a freely available content contribution network for the DPLA and other aggregations. Artstor will make a 1:1 match of a $750,000 of contributed staff time to meet the total project budget of $1.5 million. Activities funded include the various components of software development (including system analysis, user interface design, policy and legal assessment of legal review logic, software development and integration, metadata policy setting, and software quality assurance testing), implementation, meetings, and outreach and promotion.