

Building for Tomorrow: Collaborative Development of Sustainable Infrastructure for Architectural and Design Documentation

Summary

The Frances Loeb Library at the Harvard University Graduate School of Design seeks \$100,000 for a National Forum Grant under the National Digital Platform funding priority to support two priority-setting meetings of engaged stakeholders – architects, architectural historians, archivists, librarians, technologists, digital preservationists, and others who will frame a national/international collaborative infrastructure to support long-term preservation of digital design data, specifically in the architecture and design fields. The infrastructure includes the ongoing integration of knowledge, technologies, and management across generations of technology and practice.

Statement of Need

An area of digital preservation research and practice that is growing in importance particularly to the fields of architecture and architectural history is documentation of the design process. The use of 2D and 3D Computer Aided Design (CAD) and Building Information Modelling (BIM) software is now routine in many architecture and design firms. 3D software is also used for interactive teaching in architecture schools, and for virtual built environments. 3D models describe geometry and other properties of physical objects, and are visualized with computer graphics. Most architecture firms are working entirely by computer and therefore the record of architectural design is increasingly almost entirely only in digital form. Furthermore, the contractual deliverable is shifting from printed, wet-signed and wet-stamped drawing sets to an electronically signed model that can be manipulated to achieve equal, if not more, granular information than the traditional printed plans.

In architecture and design projects, there are many types of digital files produced during design and construction that are important for long-term preservation for future renovations/restorations and scholarly research. In addition to 3D CAD models there are hundreds or thousands of detailed 2D layer drawings produced for particular aspects of a building; there are 3D printed objects; there are project “out-puts” – for example, drawings or sketches of the building. There are photographs and videos of the construction site, websites about the building, BIMs, and other multimedia related to the project; there are copious communications among architects, clients, contractors and other parties, including email, contracts, specifications, RFIs (requests for information) and ASIs (architect’s supplemental instructions). To preserve the records of significant building projects completely, all of this digital information should be captured and linked or packaged together into a collection that can be easily searched, navigated, and preserved over time.

There are many CAD software vendors that supply the architecture, engineering, and construction industry including Autodesk, Inc., Microstation, CATIA, and others. As with all digital software, file format obsolescence is a barrier to our ability to archive many digital design files. Over the last fifteen years, the risk of losing this portion of our digital cultural heritage has grown tremendously. The loss is a global issue, and as such should be addressed collaboratively across multiple international institutions, bringing together the expertise of all stakeholders and to leverage digital curation and preservation practice with design principles to collaboratively forge a compliant and sustainable infrastructure to continually identify opportunities and solutions to address challenges.

Architectural museums and archives are faced with a rapidly growing need to preserve digital information and are grappling with the issues of the need for technological tools, the need for technical expertise in digital preservation, AutoCAD expertise, archival expertise, and the need for repositories that can preserve and disseminate the archived data.

Pre-grant Community Progress

The curatorial Department of Architecture at the Art Institute of Chicago undertook a study in 2003 to identify requirements for creating and maintaining an archive of born-digital objects. Kristine K. Fallon, FAIA was principal investigator. The report of the study included recommendations on procedures and technology and related requirements, and a start-up plan. The [full report](#) provides more information.

In 2007, the MIT Libraries was awarded an IMLS grant to take the next steps in the study of long-term archiving and preservation of digital data from architectural projects. The Future Proofing Architectural Computer-Aided Design (FACADE) project worked with design data from Frank Gehry, Moshe Safdie, and Thom Mayne; it explored how to relate 3D designs with related 2D drawings, digital images and videos, email and other communications, and with BIMs. The project produced a prototype archive for the material using DSpace. One intent of the research was to prototype a system that could be shared with other institutions, allowing collaboration across institutions. Through community discussions, it was clear that many institutions, especially smaller ones, are often lacking technical infrastructure and expertise to implement the model developed by the FACADE team. The [final report](#) offers further information.

The Society of American Archivists Architectural Records Roundtable launched a CAD/BIM Task Force in 2013 as a catalyst for a community-wide initiative to address the numerous (legal, technical, and curatorial) issues of born-digital architectural records. The work of the task force to date includes a survey of firms and architectural archives to learn about holdings and current archival practices for born digital design data, a [Born Digital Studies Bibliography](#), and a [report](#) of the task force.

Harvard University Graduate School of Design

In September 2014, the International Confederation of Architectural Museums (ICAM) held its conference in Montreal and New York. The opening session was devoted to the topic of archiving born digital architectural materials. Representatives from five international institutions of varying sizes discussed the topic and highlighted efforts at institutional levels to deal with digital design data. The complexity of the problem indicates that it is one that should be addressed not institution by institution, but rather collaboratively across institutions large and small at the national and international level.

National Forum Grant Activities

The primary activity of this grant will be to bring a diverse group of stakeholders together to think collaboratively about the issues in preserving architectural design data, and to find alignments with other areas of digital preservation through convening a three-day community forum and follow-up meeting. Stakeholders include architects, architectural historians, archivists, librarians, technologists, digital preservationists, CAD software vendors, and intellectual property professionals. Invited guests from stakeholder organizations will include representatives from the Harvard University Graduate School of Design; the Society of Architectural Historians; the American Institute of Architects (a representative from the AIA Strategic Council); Library of Congress (participants in the development of "Sustainability of Digital Formats"), the Society of American Archivists President and Architectural Archives Roundtable; the Digital Library Federation; librarians and archivists from architectural archives of varying sizes (Avery Library, Canadian Centre for Architecture, UC Berkeley Environmental Design Archive, Art Institute of Chicago, the Royal Institute of British Architects, The Cambridge Historical Commission, Sasaki Associates, and others), digital preservation organizations including the Software Preservation Network (SPN), AVPreserve, the Digital Preservation Network (DPN); technologists from the library and archival communities; DURAAARK (Durable Architectural Knowledge); the software vendor community, including Autodesk, Inc.; BitCurator; DPLA; HathiTrust; CNI; and IMLS.

In preparation for the forum, one-on-one conversations will be conducted with representative stakeholders – AutoDesk, architects, historians, architects, archivists from small, medium, and large sized institutions, and preservation technologists – to understand the critical points for discussion across a broader community. This will identify topics of commonality and will focus the forum's agenda on the priorities, opportunities, and challenges that will populate the resulting action agenda for a collaborative infrastructure. The results of the one-on-one conversations will inform the content and logistics of the forum, which will include identification of what is needed to solve the range of issues (the state of digital design data, barriers to archiving, software industry practices, intellectual property, digital preservation, preservation tools and archiving tools), and to identify tools and standards already in existence that can align with this community's needs. A second action from the meeting will include the formation of a Steering Committee, comprised of four to nine people self-identifying as willing to move things forward by developing an action plan of immediate next steps required to move this initiative forward.

The second meeting will be comprised of the Steering Committee, who will refine the work plan, define a set of achievable activities, identify resources required to take action, and to develop a dissemination plan for the results of the work undertaken in this grant. This meeting will be convened in conjunction with a conference that most members of the Steering Committee will be attending – this may be SAH, SAA, or an AIA conference.

The work plan will include identifying existing tools for collecting, describing, managing data files; identifying and disseminating standards for preservation; a process for removing barriers to intellectual property issues; and the appropriate types of organizations to support the effort. Such a set of tools will provide an infrastructure that can be used by architectural practitioners to manage their working files, as well as by cultural heritage repositories and can be shared across communities and institutions of all sizes.

Relevance to National Digital Platform and Impact

Previous work done in the area of archiving digital design information, and current work in multiple architectural institutions is evidence of the growing need to bring digital design data into the national and international digital preservation conversation, to identify those collaborative and interoperable tools already in existence that support the preservation of digital cultural heritage that are accessible to institutions of all sizes. The forum and steering committee meeting will provide transformative thinking about the preservation of architectural archives as a global issue, rather than an institutional issue; the forum will foster collaborations between architects and libraries, museums, and archives, technologists, and digital preservationists that will allow us to move to a shared infrastructure that supports a National Digital Platform for cultural heritage materials.

Estimated Budget

Funding requested for this community forum is estimated at \$100,000 to cover the cost of organizing and hosting a three-day community forum at the Harvard University Graduate School of Design and a follow up meeting of the Steering Committee. Anticipated costs will support participant travel, lodging, and food for the meetings. An indirect cost rate (Overhead) of 34% will be applied which is the predetermined federally negotiated rate for Other Sponsored Activities-A03.