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Cataloging in the Cloud: Shared Shelf and ArchaeoCore

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Abstract

Cloud- based image cataloging and file management offers many potential benefits in terms of saved resources, ease of access, and security of assets. In addition, the potential for collaborative work is vast. With a cloud-based system it is possible for different institutions to collaborate to develop a shared set of fields for a specific discipline that will contextualize data, promote sharing, and enrich teaching and research. Another benefit of a shared system is the ability of researchers to contribute images and data where the research is taking place.

Shared Shelf's metadata management tool provides such a platform for collaboration. The University of Virginia is using Shared Shelf to develop a new metadata standard for archaeology, one that we hope will be universally applicable to the different areas of the discipline. ArchaeoCore, as this working model is known, will provide a structure to carry the context with the object. This effort, while still a work in progress, has already provided valuable insights into the organization and expression of specialized data. It offers helpful perspectives in the creation of projects in other academic disciplines and will provide a conceptual model for legacy collections.

Keywords

Cataloging, Shared Shelf, Archaeology, Metadata, Cloud, Core, Relational structure, Standards, ArchaeoCore, Conceptual model, CIDOC-CRM, MIDAS Heritage, DAACS, Ontologies, VRA Core, ARTstor, SaaS

Author Bio & Acknowledgements

Elizabeth Darocha Berenz is a Senior Implementation Manager at ARTstor, where she works on the Strategic Services team to manage relationships with Shared Shelf subscribing institutions to ensure proposed solutions support participant requirements and lead to successful implementation of software and services. She received an MA in Modern Art History, Theory, and Criticism from the School of the Art Institute of Chicago and an MLS from the University of North Texas, concentrating in Digital Image Management.

Ann Burns is the Image Management Librarian at the Fiske Kimball Fine Arts Library at the University of Virginia. Her collection supports the teaching needs of the School of Architecture, including the Departments of Architectural History, Landscape Architecture, Design and Urban Planning. She also works with faculty to develop projects in Shared Shelf reflecting their research interests. Ann received an MLIS from the University of North Carolina, Greensboro, and an MA in Architectural History from the University of Virginia.

Lucie Wall Stylianopoulos is Head of the Fiske Kimball Fine Arts Library at the University of Virginia. She is Librarian for Archaeology, Art, Art History and Classics. She is currently working on a project on mediaeval ceramics in Greece and is the originator of ArchaeoCore. She received an MA in Art History from the University of Chicago and an MLIS from the University of Maryland.

Local solutions for image file management can be expensive, time-consuming, and require regular maintenance and staff with technical expertise. When using locally-built and managed solutions, it may be difficult or impossible to collaborate with colleagues or share finished results. Cloud-based software can offer a quick, customized set up by professional staff. The networked nature of cloud software can also allow for sharing of both work and content.

Shared Shelf is cloud-based media file management Software as a Service (SaaS), developed by ARTstor, which allows an institution to store, manage, catalog, and share their content and data. Cloud-based cataloging and file management offers many potential benefits in terms of saved resources, ease of access, and security of data. A project is entirely managed in the Shared Shelf system from start to finish: setting up the metadata schema, cataloging the data, uploading and storing the associated media files, as well as publishing and sharing the content. A Shared Shelf user sets up a project in Shared Shelf by defining the project specifications regarding fields, field types, field labels, controlled list values, external and integrated resources accessed, and the actual cataloging screens that will be used by catalogers.

In order to set up similar file management projects quickly, colleagues within an institution may benefit from sharing or copying project templates. Within a consortium or other arrangement among institutions, it may also be desirable to share project templates to save resources in planning and set up. It can be difficult or impossible to share project set up specifications between different institutions using separate customized databases, due to differences in project specifications, metadata schemas, and security measures, such as firewalls, that prevent such sharing. Using a cloud-based service like Shared Shelf allows project templates to be shared across projects both within an institution, and also across cooperating institutions. A Shared Shelf user can copy all or part of another project's template to quickly set up a new project, using the project set-up as is, or he/she can further refine and customize the project settings.

It may be important for different levels of users to access the same project, and a major part of any cataloging project is determining and defining access points. One project in Shared Shelf may have multiple cataloging screens (or sets of fields for catalog entry), which allow different fields to be edited or reviewed by different users for varying purposes, such as an administrator, a cataloger, a faculty member, and so on. A project may have unlimited cataloging screens, and each is entirely customizable. For example, an institution using Shared Shelf may set up several specific cataloging screens for specific purposes based on the users accessing the screens:

- A **master cataloging screen** displays all possible fields in a project. This could be used by an administrator to review all data available for each asset and check whether a record is ready to be published.
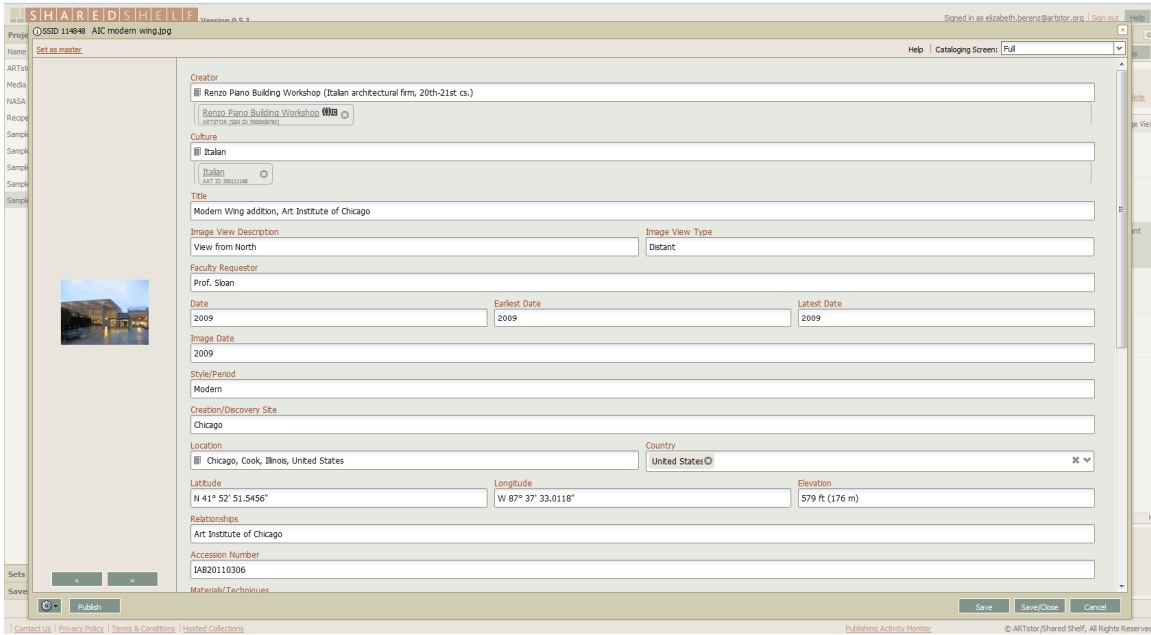
Sample Master cataloging screen

-   The same project could have an abbreviated dataset displayed in a **brief cataloging screen**. This may be used for quick entry of essential points of data by student catalogers or other staff. The project administrator could then review only those fields where the student catalogers entered data by viewing this screen.

Sample Brief cataloging screen

- An institution may want to set up a **faculty cataloging screen** exclusively for faculty data entry. A project administrator may give faculty users of Shared Shelf access to this cataloging screen so they can enter basic data for images or media files they are contributing to a collection, without overwhelming them with the many other fields possible in the project. The rest of the data could be completed at a later time by a cataloger.


Sample Faculty cataloging screen

Other ideas for cataloging screens may include: legal, administrative, and cross-departmental review. Coming soon to Shared Shelf are nuanced cataloging screen permissions for Shared Shelf users. For example, certain users may only access certain cataloging screens, with "view-only" and "edit" permissions assigned on a user-by-user basis.

Shared cataloging has been a goal of visual resources professionals for decades. Although union catalogs have existed for print collections for many years, it has been difficult to establish similar shared catalogs for image collections. Challenges to achieving this goal include collaborators following different metadata schemas and using different standards for data entry. Collaborative cataloging is possible with Shared Shelf through several related facets of the project. One feature, Shared Shelf Names, allows Shared Shelf users across different institutions to access and add to the name registry available in Shared Shelf that combines names from the Getty Research Institute's Union List of Artist Names (ULAN), creator names contributed by ARTstor, and creator names shared by other Shared Shelf subscribing institutions. Shared work records will also be possible in the future via Shared Shelf, starting with the Built Works Registry[1], a joint endeavor of

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[1] For more information about the Built Works Registry, please see:
http://builtworksregistry.wordpress.com/about/

the Avery Library at Columbia University, ARTstor and the Getty Research Institute. The Built Works Registry is a community-generated data resource for architectural works and the built environment that will be available to scholars and catalogers from academic and cultural heritage organizations worldwide. Built Works Registry data will also be contributed to the Getty Research Institute's planned Cultural Objects Name Authority (CONA)[2].

To increase cataloging efficiency, the Shared Shelf network allows subscribers to integrate authorities directly within a project for quick reference and addition to an asset record. Shared Shelf incorporates authorities by linking them to any field in a cataloging template. Currently the Getty Research Institute's Thesaurus of Geographic Names (TGN) and Art and Architecture Thesaurus (AAT) are available as linked authorities, which means catalogers can look up terms in either resource and immediately add them to a data record from within the cataloging screen. Additional integrated authorities are coming soon, including Iconclass and the Library of Congress authorities.
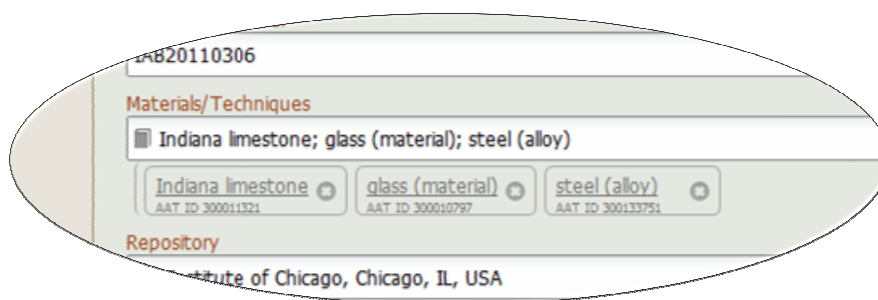
Materials/Techniques field with integrated Getty Art and Architecture Thesaurus authority

A Shared Shelf subscriber may also link to any external, web-based authority from any field in Shared Shelf, which means the link to the resource will be stored within the project and a fielded template will be available for entering the term and reference ID.

Every visual resources collection is concerned with secure backup of data and files. Using a cloud-based system ensures work is saved and backed up remotely, in addition to local backup systems already in place. Using a system from a third-party provider may also provide a scalability that is often not possible on campus due to local constraints of staff and budgets.

One major benefit of cloud cataloging is the project's ease of accessibility: the content can be reached, used, and shared anywhere there is Internet access. In the next half of this paper, Ann Burns details how she and her colleagues are using Shared Shelf at the University of Virginia, including how they are taking advantage of their projects' ease of access.

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[2] For more information about CONA, please see:
http://www.getty.edu/research/tools/vocabularies/cona/about.html

The University of Virginia and Shared Shelf

The University of Virginia's adventure into metadata cores began after we started cataloging in Shared Shelf, when we realized that VRA Core 4.0, which underlies the original set of fields in Shared Shelf, was not entirely appropriate for the discipline of archaeology. The accurate recording of many fine details is critical to the thorough study of archaeology as well as to art and architecture. Nevertheless, the VRA Core heavily emphasizes object over place, a concept that is most useful when applied to objects that are not dependent on their place of creation (art works) or objects that are intrinsic to their setting (architecture). Archaeology deals with objects in their original context, even when they may have been removed from their place of discovery. Archaeology needs a schema that does not lose its rich contextual data.

Based on an environmental scan of conceptual models for archaeology conducted by Lucie Stylianopoulos, Head of the Fine Arts Library and the Archaeology Librarian, we conceived of a conceptual schema for archaeology. We began by searching for a standard similar to the VRA Core that would reflect the concepts that are of particular importance to the study of images of archaeology. We also hoped that we might discover a single set of fields that would cover all cases. We rapidly discovered that we were optimistic in this hope. There are indeed several schemas that categorize archaeology. CIDOC Conceptual Resource Model (CRM) includes not only an ontology for description but also the CRM Core, an XML data standard. It is considered the most useful and comprehensive model for archaeology to date, but the element set is still too unwieldy for practical application. The CIDOC-CRM has recently been refined into LIDO: Lightweight Information Describing Objects ("CIDOC Lite"), but this emphasizes description of objects in museum care, not field data.

MIDAS Heritage: UK Historic Environment Data Standard, like CIDOC-CRM Core, is designed for normalization of data collection as well as use in metadata for digital display. However, MIDAS was developed for use in the particular archaeological environment of the UK, and therefore is somewhat limited in scope. DAACS, the Digital Archaeological Archive of Comparative Slavery, the Minnesota State Historic Preservation Office Archaeological Inventory Database, and OCHRE, the Online Cultural Heritage Research Environment at the University of Chicago are examples of other standards developed with a particular type of archaeology in mind, or to serve the discipline in a particular land area.

We approached ARTstor and Shared Shelf with our concerns and found them extremely receptive to the idea of creating other methods of organizing data. Our team at UVA talked with various experts, including practicing archaeologists and catalogers working with archeological finds, and sent emails to friends and colleagues in the profession. It rapidly became apparent that nobody knew quite what to do about cataloging archaeology images. Most of the emails that we received in answer to our queries consisted of requests that we forward our schema when we had created it. It is very clear that an archaeology schema would fill a void that has been troubling image curators as well as archaeologists for some time.

ArchaeoCore, the archaeological metadata schema developed at the University of Virginia by the Fiske Kimball Fine Arts Library team, is based on the CIDOC-CRM. We developed a site-based model that emphasizes CRM place and temporal entities, including name changes, transformation of sites, and context. The structure of ArchaeoCore provides a mechanism for connecting variant phases of archaeological excavation of a site over a wide chronological span.

Our efforts focused on foregrounding the site as a whole, including the excavations conducted over time, over the objects found. We established two Shared Shelf screens, one for the site and one for the artifact, which would illustrate this division for the cataloger. The Site screen would describe the site, including historically known creator and place names, locations not only of the site itself, but different excavations within the site, and site creation dates. This screen would also record data about the dates of excavations, the excavation directors, and physical features of the site. The Artifact screen would more closely fill the traditional role of the VRA Core in recording the features of the object, but we added fields for certain concepts of importance to archaeologists, such as Reference, Munsell color number, and Terminus dates.

Sample of Site and Artifact screens, ArchaeoCore, May, 2012

ARTstor and Shared Shelf proved extremely patient and flexible in giving us the tools we needed and the field order we needed to make this work, both in the Shared Shelf cataloging screens and in the ARTstor information panel. We conferred several times with Shared Shelf developers to establish a preferred field order, so that the information could be entered at one end and presented at the other in an order that made sense. When Shared Shelf made the project schema visible in their demonstration database, we assigned some archaeology graduate students to add test metadata, and made changes to the project based on their feedback. We also released our project setup spreadsheets to other members of the first 25 Shared Shelf subscribers and to other scholars for feedback.

Our desire for outside help and expert feedback resulted in several collaborative efforts before we had cataloged more than a handful of images in our new schema. For example, objects in a ceramic collection from a site in Greece were cataloged in June 2012 as a first test. ArchaeoCore will be also be tested this year in the field at a site in Turkey.

ArchaeoCore will be tested on a larger collection at the University of Virginia in 2013. The Flowerdew Hundred collection of artifacts, which were excavated over a period of years at a site near Hopewell, Virginia, represent occupation by Native Americans, English colonists, and African-Americans from prehistory through the modern era. Our work will initially focus on the historic period, from the 17th through the 19th centuries. The curators of the collection are extremely interested in using Shared Shelf to finally and permanently catalog their collections and display images of them for scholarly use.

The Dumbarton Oaks Research Library of Harvard University, in Washington, DC has expressed interest in using ArchaeoCore to record metadata for the Robert L. Van Nice Collection relating to Hagia Sophia. The collection, while initially conceived as architectural history, acquired an archaeological aspect in the process of physical examination, and includes many artifacts as well as plans, drawings, and photographs of the architecture and archaeology of the structure.

Dumbarton Oaks and the University of Virginia have already begun discussions on collaborative projects for sharing archaeology data. We have applied for an NEH grant to expand development testbeds for both of these collections. The distinct advantage of Shared Shelf for this attempt is that it is cloud-based. Because the site is accessible through the web, it can be accessed anywhere there is a stable Internet connection. This feature will be of immeasurable help in developing our schema, as interested parties scattered up and down the East Coast work together in real time. It will also be possible to test the schema in the field, as archaeologists actively digging can enter information as soon as it becomes available. One of the aims of the grant is to provide a relational structure that is successful not only in Shared Shelf, but in any cataloging environment. Our ultimate goal is a successful structure available as open source.

In late July 2012, an opportunity arose to expand that collaboration in the form of a one-day "Archaeology Metadata Summit" at Princeton University, convened by Trudy Jacoby, Director of the Visual Resources Collection, Department of Art and Archaeology, of Princeton, and attended by Jenni Rodda, Manager of the Digital Media

Services and Image Archive of the Institute of Fine Arts, New York University, as well as Anne-Marie Viola, Metadata and Cataloging Specialist and Shalimar White, Manager, Image Collections and Fieldwork Archives, Dumbarton Oaks Library Lucie Stylianopoulos, Head of the Fiske Kimball Fine Arts Library, Ivey Glendon, Metadata Librarian, and Ann Burns, Image Management Librarian, attended from the University of Virginia. We thoroughly discussed the ArchaeoCore schema, with input from classical archaeologists Joann Smith, Director of Excavation at Polis (Cyprus) and Matthew Adams, Field Director of Excavations at Abydos (Egypt). Our desire to contribute a truly helpful way of organizing archaeological data in Shared Shelf's convenient web-based distribution model generated much enthusiasm and many good ideas. Our two screens, Site and Artifact, will now expand to four (Site, Campaign, Artifact, and Technical/Administrative), as a prototype for a relational structure for ArchaeoCore in Shared Shelf.
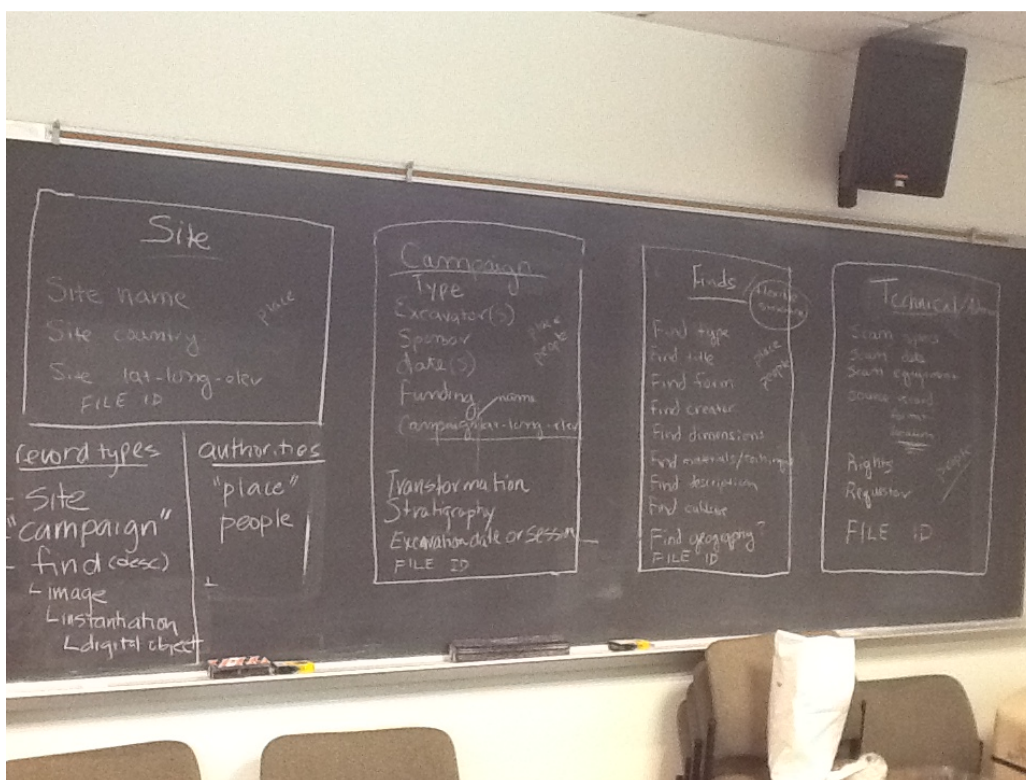
ArchaeoCore schema revisions, Princeton, July 2012 – photographed by Ivey Glendon

The Summit participants agreed to continue discussions on ArchaeoCore's development in later meetings. The ArchaeoCore structure will be further refined in panel discussions at the 2013 College Art Annual Conference in New York and the 2013 ARLIS Annual Conference in Pasadena, California.

To date, UVA has mapped out several projects for researchers not only in archaeology, but other fields as well. Each of these gives us valuable insight into what makes a useful project and what types of data can be considered equivalent for the purposes of sharing data on a wider scale. We are currently assisting the Eleanor Crowder Bjoring Center for Nursing Historical Inquiry at UVA with a project to record the experiences of public

health nurses in U. S. urban centers in the 20th century. Two Anthropology professors are organizing images of their research in Papua New Guinea in Shared Shelf. They anticipate sharing their project with experts from the University of California at San Diego, and eventually contributing the images to UCSD's Melanesian Archive. A Medical School professor hopes to display her extensive collection of historical images of African-American medical personnel at work. The former Rock Director of UVA's alternative radio station, WTJU, hopes to use images cataloged through Shared Shelf as a the basis of a website on the history of the radio station. The website, once created, will use crowd-sourcing to collect additional information, providing a rich resource not only on the station, but on the history of popular music viewed through this particular lens.

We believe that Shared Shelf's flexibility as a platform for sharing the inputting of data on a local level is the first phase of an eventual ability to share data among many entities and institutions. Shared Shelf's internal links to databases maintained by other organizations, such as the Getty Vocabulary Program and the Library of Congress enable different collections to interact in a stable way. We anticipate that this philosophy and infrastructure of sharing will streamline our collaborations with other groups as we continue to improve ArchaeoCore.

Furthermore, we are investigating ways of expanding our shared data by extracting the information and images added to Shared Shelf though scripting so that the owners and other users can use it to create other paths to these riches, through Omeka, Drupal, or Wordpress. Shared Shelf has already developed a plugin for adding data and images to an Omeka website. Once images and data have been added to one database accessible from the cloud through the web, it should be possible to recombine this material in many exciting ways.

This concept of many-different-people-in-many-different-places contributing to the data about images is, we believe, the most exciting aspect of the Shared Shelf model. Historically, the Fine Arts Library's image collections have emphasized architectural history, particularly in the western world. We look forward to expanding that emphasis to other cultures and disciplines in other parts of the world, and sharing knowledge with image specialists in other areas. Contributions can be made not only from across a single university but from across the country—or across the world.