University of California Shared Image Collections: Convergence and Expansion

Lena Zentall, California Digital Library, and Maureen Burns, University of California, Irvine

> *Collaborative production, where people have to coordinate with one another to get anything done, is considerably harder than simple sharing, but the results can be more profound.*
> —Clay Shirky[1]

We are in the midst of an unprecedented explosion of digital images on the Web. For a telling contrast, in 1997, the Art Museum Image Consortium, with twenty-two charter partners (later growing to forty or more), took eight years to painstakingly build a digital library of over 120,000 images.[2] Compare this noble grandparent of image services to the young whippersnapper Flickr.[3] Weinberger, in his 2007 book *Everything is Miscellaneous*, estimated that Flickr had approximately 225 million images uploaded by users with almost one million being added every day, not to mention the 5.7 million tags applied, a total of 540 million times.[4] With the world doing image collection development and cataloging, how are information professionals to keep up with this explosion of image resources and bring archive, library, museum, and preschool-through-university patrons along for the ride?

Although image-intensive patrons in architecture, art history, and studio art are traditionally at the core of the visual resources professional's work, a full array of arts and humanities disciplines, as well as emerging populations from all corners of our institutions and surrounding communities, are demanding images. Using images for research, teaching, and learning has almost become a minimum educational standard. Therefore, whether image users are coming to the library or departmental visual resources collection for assistance or not, it is going to take a responsive team of professional staff to meet the demand for images effectively and to ensure patrons are finding what they need, when they need it, not to mention figuring out how to use, manage, and preserve images once patrons have found them.

The University of California (UC) Shared Images project is uniquely poised to make digital images for teaching broadly available for faculty and students campus-wide and more importantly, *UC-wide*. During the past year, the California Digital Library's (CDL's) Image Service Strategic Planning team re-envisioned a shared service that would leverage CDL's strengths in licensing and facilitation to bring together the image collections of each campus for sharing across the ten-campus University of California system.[5] In the initial phase, CDL is joining forces with UC visual resources collections (VRCs) to introduce this most recent initiative to share digital images.[6] UC Shared Images is a type of image collection cooperative. Each campus manages its own image collections, which they load into ARTstor as institutional hosted collections.[7] Together, these individual collections comprise UC Shared Images and are openly accessible to all other UC campuses subscribing to ARTstor. UC Shared Images provides opportunities for the distributed campuses to combine the images requested by faculty for teaching with licensed image content, ARTstor's core content, and any personal collection images faculty might want to spontaneously upload themselves.

This article discusses the process of planning and implementation with an emphasis on the organizational culture, the logistics involved, the lessons learned, and emergent issues. Two different perspectives are combined in order to cover the gamut of UC's current work with digital images—from the strategic planning of digital libraries to the front lines of visual resources. However, the authors must emphasize that ten UC campuses encompass archives, libraries, museums, and visual resources collections, with both unique material and instructional surrogates, supporting a wide range of research and area studies from the arts to the sciences.[8] Therefore, a broader network of UC creative professionals and image stakeholders are at work than can be adequately represented in the scope of this article.

Background

The University of California has been providing digital images to its educational constituencies for over twenty years through a number of distributed and centralized projects, especially in the visual-centric areas of architecture, arts, and humanities. With each project, hands-on experience has been gained and crucial lessons learned about planning, processes, teamwork, and, most importantly, flexibility.[9] Time-honored, analog content has been digitized, licensed, and subscribed to; image access and management tools developed and evaluated; and a stakeholder community built. This has enabled the old and the new to be joined in innovative ways encouraging fresh approaches to teaching and learning by faculty and students. Yet when exploiting new technology, there is no room for complacency, since anticipating change has always been part of the planning and ongoing development is crucial to keeping up with current trends.

With ten campuses and adequate resources to support a major research institution, it is easy to imagine the wide array of project development and technological experimentation occurring on UC campuses. The focus here is on one piece of the picture—the existing teaching collections in the arts and humanities and the available licensed and subscription-based content. Architecture, art history, and studio art cannot be taught without an extensive array of images to draw upon and the pedagogical change to teaching digitally has impacted these disciplines profoundly.[10] That UC's visual resources collections have traditionally provided the necessary instructional images for these areas is evident in the fact that twenty percent of UC's image holdings (numbering a staggering fifteen million in approximate total) are readily available to faculty and students.[11] With the onset of digitization, the UC visual resources curators saw the need to extend the analog tradition of building shared departmental image collections, but it was only with the institution of the California Digital Library (CDL) that a UC system-wide vision could be formulated and actuated.[12]

To provide some context, three efforts in particular are discussed, although many more could be mentioned. In the mid-1990s, the UC visual resources curators created a data bank of digitized instructional material called the Library of UC Images (LUCI).[13] LUCI was the first attempt by the UC visual resources curators to find out what it might take to create a union catalog of digital images with associated descriptive data delivered on the Web; in the end, seven of the ten campuses participated.[14]

In 2003, CDL stepped up with the UC Image Service Demonstrator Project (referred to as the Demonstrator throughout) consolidating a variety of UC imaging projects, including LUCI. UC-owned images were federated with free and licensed

image content using Luna Imaging's Insight, a software product with robust cross-collection search capabilities and an advanced suite of image management and presentation tools.[15]

Meanwhile, another large-scale project was in the works at UC San Diego, a campus that received funding from the Mellon Foundation to digitize a substantial portion of the Library's visual resources collection to enhance the growing ARTstor digital image library.[16]

This was the environment when Lena Zentall became CDL's Image Service Manager. There had been task forces, surveys, rollouts, usability assessment, but it became clear that it was time to go back to the drawing board for more adjustments.[17] Bart Strong, in *Educause Quarterly,* indicates the necessity for follow-up as well as reviewing, refreshing, and renewing strategic plans. In addition, he suggests: "Building technological change into the strategic planning process prepares an institution to anticipate, recognize, and adapt to change."[18] CDL formed an Image Service Strategic Planning Team who examined a full range of issues, risks, and options in order to redefine what a UC-shared image collection could be. In the end viable options encouraging the widest participation were presented and stakeholder input was sought. The result of this re-evaluation of options is discussed in more detail below.

Selling It

LUCI and the Demonstrator were UC responses to the need for digital image content delivery to faculty and students even before these patrons were actually requesting digital images or teaching with them in the classroom. Anticipating this need and obtaining hands-on experience better positioned UC visual resources curators for what turned out to be a rapid changeover in the last two years, although it was a struggle to add these projects to an already heavy analog workflow. For LUCI, it was finding the time for ongoing planning and to write/administer grants, manage the workflow, and train staff. With the Demonstrator, it was making time to learn how to use new software tools, finding ways to publicize the project, and supporting users.

Resource disparity between campus collections in terms of staffing, budgeting, and technical support also came into play depending upon the size and specific mission of the various campuses. Some VRCs have more staff members, bigger budgets, better technical support, etc. Because of this disparity, most UC VRCs use different databases to manage their image collections depending upon what their department can afford and the technological support available.

Six UC VRCs are stand-alone facilities considered departmental or school resources located in architecture, the arts, or the humanities and directly answerable to their primary patrons' departments. The smaller user constituency of the departmental collection often means variable resources and more patron control, whereas VRCs responsible to larger entities tend to have more flexibility for working collaboratively.

Merced (the newest campus), San Diego, San Francisco (medical only), and Santa Cruz images are situated more solidly in their university libraries with the associated benefits of such collective expertise and resources. Whichever context, it is a balancing act for curatorial staff to ensure they are meeting their local campus

patrons' needs on a daily basis while also finding ways to collaborate on system-wide projects.

Berkeley's VRCs in Architecture and Art History are unique in that they have historically had extensive technical expertise provided by their campus Museum Informatics Project (MIP).[19] With LUCI, the great benefit of MIP's technical leadership and support was extended to all the participating campuses. It became clear that partnering with educational technologists was paramount to the success of such digital image projects.

When CDL was formed in 1997, the UC Visual Resources Group began inviting representatives from this newfound entity to join in on annual summer meetings. CDL took the lead on the Demonstrator, which also facilitated better collaboration between the UC VRCs and UC Libraries.

MIP and CDL have provided UC VRCs with advice about appropriate strategies, standards, and policies; the infrastructure to share image resources across repositories; the software tools to manage digital images; archival storage of images and descriptive data; and, ongoing technological development services. If the UC Visual Resources Group would have had to work in isolation on either project, it is unlikely such rapid progress could have been made. Instead the leadership, technological focus, momentum, and support they provided, combined with local VR efforts and image expertise, brought home the value of collaboration to: (1) rapidly expand image access, (2) distribute the workload and costs across the system, and (3) allow everyone the opportunity to contribute to digital image service development.

Great strides forward had been made with LUCI and the Demonstrator, but UC curators still did not have a spontaneous way to move their digital images into these projects. Shared images did not have to be "sold" to the UC Visual Resources Group, but it became more apparent than it was at the outset that there were many other image stakeholders on the UC campuses who needed to be invited to participate and convinced in order to progress.

How do you sell the idea of a shared collection to various stakeholder groups? First and foremost, CDL needed to argue convincingly that it was the right time to develop a large-scale shared image initiative. The timing was good from the perspective of the perceived need of end-users (the increasing number of faculty teaching with digital images), maturing standards for cataloging and sharing images (e.g., VRA Core 4, Cataloging Cultural Objects), and UC's increased attention to the efficiencies gained in system-wide services. A final critical component was the strong unity and shared vision of UC visual resources, providing a key group with which to collaborate on the initial phase.

At the most basic level: what problems did CDL intend to solve? The following were identified as the core issues on which to focus:

- Providing hosting when it is not available from image vendors
- Aggregating images from disparate sources
- Investigating ways to overcome the lack of time, support, resources, and expertise to manage large-scale image projects at the campus level
- Satisfying faculty's need for specific images for teaching, which may not be available in the existing licensed collections
- Providing images for students to use for research, study, and presentation

Defining the parameters of the service was the most time-consuming and challenging part of the process. During this period, many documents were produced examining assumptions, expectations, values, goals, strengths, barriers, and risks. Five basic scenarios were used as a basis for examining options, including two vendor solutions for consortia hosting, building a shared image collection at CDL, or partnering to build it. The strengths enabled by each option were evaluated (considering the things CDL is positioned to do well) along with the many challenges facing campuses in terms of managing images.

CDL quickly realized it could not solve the problem of local image management, although there was a strong need for this at nearly every campus. Most UC VRCs have hundreds of thousands of item-level image records (textual descriptive data) presently managed in aging databases, not all of which are based on current standards or provided with Web interfaces to deliver the ever-growing collections of associated digital images. The issue of faculty personal collections, at the other end of the spectrum, had risen to the surface as well. CDL conceded that this too was beyond their scope, although it is one of the most critical issues facing faculty and staff, particularly for image-intensive disciplines such as art history.

Once it was established that CDL's strengths were in aggregating collections, consortia licensing, and fostering cooperation among campuses by bringing together stakeholders, it was clear which components of the larger shared image initiative it made sense to tackle. CDL would bring together the players, manage implementation (including facilitating policy and standards creation), co-invest along with campuses in the service, and continue to purchase licensed collections.

After selling the idea of a shared collection internally at CDL, and defining potential solutions, the input of stakeholders was sought. To be successful in this endeavor, CDL needed to understand the relationship among the various stakeholders and their priorities. CDL's Image Service Strategic Planning Team realized early on they needed a solution that would be supported by the UC Libraries and campus educational technologists. Libraries support broader cross-campus audiences and have larger budgets than departmental VRCs. Therefore, CDL approached the appropriate committees of the system-wide UC Libraries and they agreed to support the shared image collection.[20] A co-investment model was proposed based on the one used for shared licensing at UC, wherein each campus pays a percentage of the total cost based on their campus size. This was a good deal for campuses since CDL paid all the up-front fees and charges for the first six months of service, a substantial savings compared to what campuses would have paid separately. After getting the green light from the UC Libraries, CDL vetted the proposal with the Image Service stakeholder group–a mixture of visual resources curators, art librarians, educational technologists, and other image experts.[21]

The other major group to weigh in on the decision was a system-wide advisory group of University Librarians.[22] The extensive communication and work accomplished upfront to produce a comprehensive and clear proposal was cited as a factor in gaining swift agreement from the group for the proposal.

Although the key players in the initial phase of this new initiative are the CDL and UC VRCs, the intention has never been to be exclusive. It is open to any interested UC archive, library, or museum, and to partners in educational technology. Such a project would be untenable without an inclusive, extended network of partners. The key players involved were:

- UC visual resources curators
- UC librarians
    - Advisory and decision-making committees
    - UC campus front-line librarians (primarily arts and humanities, but not to the exclusion of medicine and the sciences)
- UC educational technologists (especially those involved in classroom support and learning management systems)
- California Digital Library

The key to getting stakeholders involved was to find an appropriate person who would champion the cause. In this case, Ivy Anderson, CDL's Director of Collections saw the potential of UC Shared Images. She was willing to support it financially, and was eager to participate on the strategic planning team to define the actual service. She developed a co-investment model with incentives that made participation feasible for campuses.

Rosalie Lack, Director of Digital Special Collections, was another early supporter. She inherited responsibility for image services when CDL restructured in 2006. Her earlier experience with the Demonstrator project, coupled with her years of usability assessment, provided an innovative mind to think through the scenarios.

A strategy CDL used to fully engage stakeholders was to keep all documentation brief and to define specific questions for each stakeholder group to answer. The strategic planning report to stakeholders included an executive summary, tables, and plenty of bullet points. A separate appendix with further analysis spared readers from being overwhelmed in the main report with too much detail. CDL delivered the message in person, by e-mail, and through committee representatives depending on the preferences of the stakeholder group. For the most critical stakeholder groups—the ones who would directly support UC Shared Images, such as the visual resources curators who would contribute content, and the libraries who would pay for licensing and subscriptions—CDL presented its analysis of the options in person. The single most important piece of information CDL provided stakeholders was a clear argument for why UC Shared Images was needed, followed by a rationale for how it would be funded.

Take away: (1) Find a champion. (2) Focus narrowly on a few appropriate problems to tackle. (3) Prioritize according to your strengths.

Defining It

In consultation with visual resources curators and other image stakeholders, CDL identified the following principles and goals for supporting UC Shared Images.

Principles:

- Facilitate resource sharing and co-investment
- Reduce redundant effort (e.g., digitizing the same image multiple times)
- Create efficiencies for users and contributors (e.g., simplifying workflow and user experience)
- Anticipate future needs and trends

Goals:

- Provide an infrastructure for visual resources curators to contribute images to a shared institutional collection
- Provide access to licensed images when the vendor does not provide access

- Provide and manage end-user access to images
- Enable use of images in the classroom (at a minimum, provide sufficient image size for projection)
- Enable faculty to share images with students (at a minimum, enable output to learning management systems, and course Web sites)
- Enable faculty to reuse images in the future

Why ARTstor? ARTstor succeeded in meeting the most critical needs of UC Shared Images and the team was encouraged by ARTstor's strong development history. CDL's intent was to choose a viable option that would encourage the widest participation and had the potential for immediate implementation.[23]

As a subscription service, ARTstor provides high quality and substantive core collections, and allows for UC to build its own institutional and personal collections in the ARTstor system (on their servers) using their tools and staff resources.

Who will build it? There were a variety of reasons why CDL decided to start with UC VRCs when building institutional collections in ARTstor:

- Visual resources collections are a contextual mass built and heavily used by UC faculty and students in image-intensive disciplines
- Around 100,000 images and growing are already in digital form complete with minimal descriptive data
- The UC visual resources curators asked for support in this area
- With LUCI and the Demonstrator the UC Visual Resources Group had proven itself to be a functional group eager to collaborate

Once the policy, metadata, and workflow issues have been resolved through the implementation of the initial phase, expanded institutional content can be considered. Presently, architecture archivists and special collections librarians have expressed an interest and an inclusive collection development program is being developed to allow for continued growth.

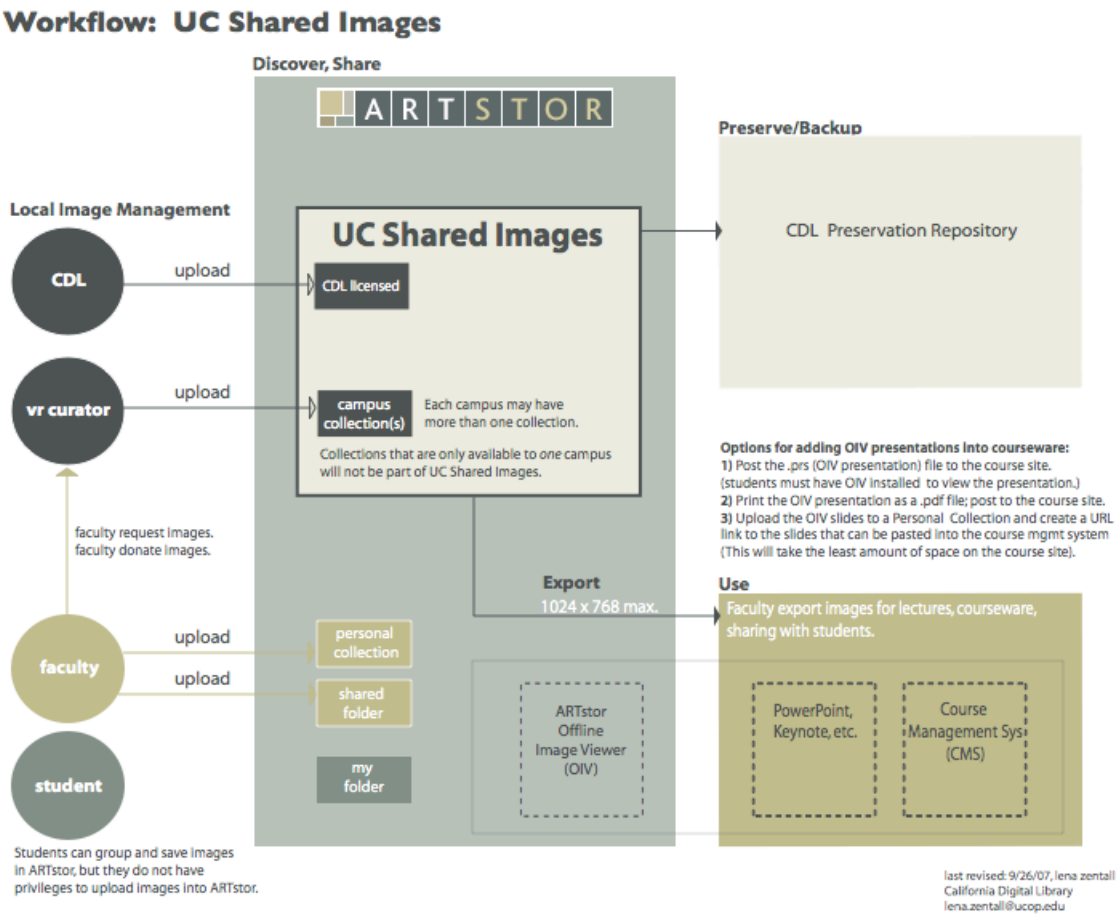

Chart showing local image management, sharing, export, preservation, and usage options for UC Shared Images in ARTstor.

Managing assumptions and risks. An important step in defining UC Shared Images was to state our assumptions and understanding of trends and to seek agreement from campus stakeholders:

- CDL will continue to license image collections on behalf of the campuses
- Campus co-investment will be required
- Faculty aggregate images from many sources for teaching (nearly all faculty use images from their own collections)
- Faculty use different software tools (to create classroom presentations and to manage their personal image collections) and prefer to have a choice
- Content must be high quality, pedagogically compelling, accurate, and timely to attract faculty
- VR curators will continue to do copy work from research materials at the request of faculty in the foreseeable future (digital copy stand equipment, slide and flatbed scanners are presently in use)
- VR curators will implement new standards, such as the VRA Core 4.0 and Cataloging Cultural Objects, to provide quality descriptive data for images[24]
- A UC-wide shared image collection may entice grant funding from organizations within and outside UC for digitizing and cataloging local visual resources collections
- Major museums have begun initiatives to make their high-resolution images freely available for educational use, which is likely to influence policy at other

museums, resulting in fewer restrictions on the size of images that can be downloaded[25]

Once these assumptions and trends were considered, CDL identified at least two fundamental risks. The first risk involved participation by campuses; the second risk involved adoption by faculty. Due to disparate resource levels, it is unlikely all UC campuses will be able to participate, either as contributors to the shared collection or as participants in the ARTstor license, therefore these questions were posed:

- What are the significant factors of not having everyone on board?
- Are there ways to allow different levels of participation?
- Are there ways for campuses to help each other?

The second risk was that faculty would not use the shared collection. Therefore, the key barriers to usage were identified and addressed in the implementation plan. These included the following:

- Faculty do not have a deep understanding of what an image service is or might potentially be
- Faculty might have the perception of being "force-fed" selected images
- Faculty need to integrate their own images easily with other images
- The interface and tools must be intuitive so faculty feel quickly empowered
- Faculty want to choose their own presentation tools (e.g., PowerPoint, Keynote, etc.)
- Faculty do not want to spend time cataloging and managing images
- Faculty do not want to download software to access images (e.g., desktop clients)
- Off-campus access is problematic (Proxy and Virtual Private Network are not well understood, not all campuses have the latter which works best with image services)
- Stagnant/inadequate content—provide the images faculty need, *when* they need them, for teaching
- Support for audio/video (faculty are already using multimedia in their presentations)

Tackling difficult issues. In addition to these risks, CDL identified several issues that would require continued analysis and consultation to resolve.

Cost. Campus co-investment would vary depending on the campus' size and specific mission. With fluctuating budgets, how do we ensure continuing access and allow for growing collections? Other cost considerations include determining how source images will be managed: (1) How many copies? (2) Who manages them? (3) Who has access to them? (4) Is a copy of metadata kept?

Collection development. UC Shared Images affords a long-anticipated opportunity for visual resources curators to collaborate as a group on shared collection development to minimize duplication of effort. Curators are not simply tossing all their images in a pile and hoping they will be useful. On the contrary, a deliberate and coordinated collection development process is what will distinguish this initiative from others. The unity of the UC visual resources curators along with the support of the UC Libraries is what makes this possible.

Copyright. An assumption of UC Shared Images was that copy stand images would continue to be used in teaching for an indefinite period. In addition, a few campuses license collections for their own campus. A requirement of hosting was to provide multiple levels of access for collections and allow contributors to restrict access to their collections—to their campus only, or to all of UC. UC Shared Images has a terms-of-use statement that applies to the collection as a whole, and requires rights information to be explicit for each image. Contributors are encouraged to confer with their local decision-makers regarding rights and sharing.[26]

Managing collection building and access. A campus collection liaison facilitates ingest of their campus hosted collections, and a user support liaison funnels support issues and distributes passwords for instructor-level privileges. How, if at all, do other departments outside the arts and humanities participate in building the shared collection? Collection development and managing source images are two areas of current negotiation between CDL and the campuses.

Integration with other systems. Working with learning management systems is essential (at a minimum, the ability to post images and links directly to unique images). Interoperability is a priority (identify the key protocols and procedures, e.g., Open Archive Initiative[27] (OAI) compliance, XML gateway). Faculty want a choice of end-user tools for classroom presentation (allow faculty to either export images or to mix their own images with the shared collection for classroom presentation).

Shared metadata model and standards. Minimum standards for images and metadata are needed. CDL convened a Shared Metadata Working Group[28] to develop a metadata model for UC Shared Images. The working group of five visual resources curators and metadata experts from different campuses developed metadata submission guidelines[29] over a six-month period. These guidelines seek to ensure that records contributed to UC Shared Images provide a predictable level of documentation and are as consistent as possible across collections.

Managing and preserving source images. It is CDL's intention to preserve materials that are part of "shared digital collections." These are defined as content that is collectively acquired or managed by the UC Libraries or content that the California Digital Library has built a shared service on, or a third-party, using UC content, has built a shared service on. Because ARTstor does not retain master images (e.g., TIFFs), a strategy needs to be developed for managing the master images to ensure that the service can be recreated in the systems of the future. In addition, campus visual resources curators have expressed a desire for long-term preservation of their images (source images and source metadata). The UC Libraries Digital Preservation Repository[30] (DPR) is a separate service from UC Shared Images. CDL will work with campuses to facilitate use of the DPR for source images and source metadata aggregated in UC Shared Images.

*Relationship to other UC image collection*s. In the foreseeable future, "one-stop shopping" for images at UC is not envisioned. Image collections are distributed across many silos including vendor Web sites, CDL Web sites, and local campus collections (e.g., UC VRCs Web services for digital image delivery). Some Image Service collections exist in a static version in one place and an actively updated version elsewhere as a result of the Demonstrator's early ingest experiments.[31] It is desirable to focus resources on maintaining active collections in cases where there is more than one instance of a collection. In the long-term, it is highly desirable to

aggregate access to as many image collections as possible using Web services such as federated searching or OAI harvesting.

Take away: (1) Identify all obstacles and create a phased plan. (2) Turn long-term strategic challenges into tactical, phased plans. Do not let them stop you from getting started.

Implementing It

Building collections. As CDL moves its licensed collections to the ARTstor hosting platform, it is testing the metadata submission guidelines produced by the Shared Metadata Working Group against the vendor-provided metadata. While it would be ideal for the vendor metadata to be consistent with UC-built collections, it is unrealistic. As a policy, CDL does not re-catalog any metadata from licensed collections; however, it will work with ARTstor to make licensed collection metadata as consistent as possible with the UC Shared Images metadata submission guidelines. A couple of simple tweaks include concatenating several fields into one field and mapping existing data into advanced search fields. More complicated methods include running date normalization to create earliest and latest dates.

To date, UC Santa Cruz has added 1,600 images, CDL has added 26,000 Saskia images, and UC Berkeley is in the process of adding 30,000 images to UC institutional collections in ARTstor. The other UC VRCs are preparing to follow these leads during the summer of 2008.

Training and outreach. CDL's implementation plan for UC Shared Images included visits to each participating UC campus (along with representatives from ARTstor) to demonstrate ARTstor and introduce UC Shared Images. This was even more successful than anticipated and resulted in interest from many departments in building collections in UC Shared Images. Important questions were raised during these visits and discussions brought together groups that infrequently or never have a chance to meet and share ideas. This was the highlight of the implementation process.

Workflow and access challenges. A major technological issue each campus faces is creating their individual workflow to extract selected images and metadata from their local databases and put them into ARTstor. Some UC VRCs are looking at an OAI harvesting method, but at this stage most will probably export their data into spreadsheets.[32] Few campuses have robust systems for cataloging and delivering images locally and VRCs are using different databases, so it is challenging to share collections while at the same time working to build a local infrastructure, much less think about preserving the digital images over time. On a parallel track, discussions have taken place about the desirability of working together with UC campuses to get their image collections into the UC Libraries Digital Preservation Repository.

With so many places to share collections within UC, how do you decide where to share your collections and whether to share them in multiple places? At this time, true access integration (even at the local campus level) is still a work in progress.

Communicating with stakeholders. A communication plan is as critical as an implementation plan. To enable ongoing communication among large numbers of participants and stakeholders spread out in a ten-campus state system, CDL initiated a stakeholders' listserv. Other methods include posting documents and policies on the Image Service Web site, and making announcements in CDL Info, a blog

newsletter that primarily targets libraries.[33] Nonetheless, CDL relies heavily on its advisory groups and campus partners to get the word out about services.

Take away: (1) Embrace imperfection (metadata is never "good enough"). (2) To achieve the greatest impact—take your show on the road and share information with faculty and stakeholders in person.

Local Roll Out

Although UC Shared Images is still in its infancy (especially when considering that ARTstor has only been available to most of the UC campuses for one academic year and UC Santa Cruz was the only campus to get a hosted collection up and available in that time) a summary of progress to date still provides useful indicators. Irvine is probably representative of many of the other UC campuses new to ARTstor and at least provides one perspective from the VRC front lines. It should be noted that four UC campuses have had access to ARTstor from its inception (UC San Diego) or soon thereafter (UC Berkeley, Los Angeles, and Santa Cruz) and they have had time to make more progress in terms of rolling out ARTstor and using it.[34]

At UC Irvine, faculty from the most image-intensive disciplines, especially Art History and Studio Art, continue to show a perplexing aversion to image services in which content, metadata, and management/presentation tools are bundled together. However, a sea change has clearly occurred since the Demonstrator project was rolled out in 2004 with more people receptive to the concept of image services, more smart classrooms available, more faculty teaching digitally, more pressure for those who are not teaching digitally to come around, and more user support. Of the nine Art History faculty currently teaching at UC Irvine, six professors and two emeriti are registered ARTstor users with instructor-level privileges, the latter allowing them access to the most advanced tools, such as building personal collections. In the area of Studio Art, of twenty-three professors and lecturers only two are registered with instructor-level privileges. It should be noted that registration is not required for ARTstor access when on campus and is only one of many measures of usage. However, it is clear that these two target disciplines are not maximizing the potential of ARTstor. There are a variety of reasons why image services are not being readily adopted at UC Irvine including the time investment to change, the necessity of training to use systems, the limited scope of contemporary art content, a preference for using ubiquitous software tools (PowerPoint or Keynote), and inconsistent access to smart classrooms to name a few, but additional assessment of the situation is necessary.

Challenge: To understand the different types of potential users' resistance and contextual constraints.

In contrast to the image-centric areas, disciplines that have not traditionally used images as intensively are eager for information about images and the tools to manage them. At UC Irvine, a campus announcement about ARTstor suggested that a better name for the digital library might be "IMAGEstor" and this resulted in a flurry of inquiries from surprising quarters, including: Cardiology, Developmental & Cell Biology, Engineering, Geriatrics, Gynocological Ontology, Otolaryngology, Pathology, and Public Health. The professor/doctor from Pathology had nine thousand images and thought ARTstor might provide a better way to manage and present them. This raised the question of whether it is optimal to mix content from

the arts and sciences in this system? Since building a hosted collection was not feasible at the time and there is not yet an easy way for individual users to bulk upload such a substantial collection to personal collections, ARTstor has not yet been used for these Pathology images. However, a librarian is now available to advise on such usage. He recently reported that four people have at least experimented with ARTstor at UC Irvine's Medical Center, but the intensity of this usage is unclear at this time.

This enthusiastic response from medicine and the sciences took the UC Irvine user support group by surprise. Some diversity in subject areas was expected since over twenty different subject area specialists have attended "Finding and Using Images" workshops over the last four years. With the arrival of ARTstor a second quarterly workshop was added called "Introduction to ARTstor."[35] Faculty and graduate students from the following content areas have attended this new workshop: Business, Classics, Comparative Literature, Dance, French, History, Italian, Portuguese, Sociology, Spanish, Studio Art, and Women's Studies. The combined total attendees from both workshops over four full academic years equals forty-four faculty, forty-three graduate students, and thirty-eight staff. Presently at UC Irvine, there are 142 registered ARTstor users, 35 percent of whom have instructor-level privileges. Between the workshops and ARTstor registration, an encouraging picture emerges indicating a broad campus interest in using digital images and the new ARTstor digital library, but more work needs to be done.

Challenge: To expand upon the present patron interest and be creative about training and support in order to reach all potential image users.

Workshop evaluations have provided feedback that indicates potential image users are not fully aware of all the image resources available on campus nor do they have a deep understanding of what image services have to offer. Therefore, a two-sided handout was created with links to key UC Irvine image resources on one side and the reasons why the campus community might want to consider using the associated tools on the other. The following apply to ARTstor in particular:

- To quickly pull together a group of images for instantaneous presentations
- Use high-quality original photography
- Discover a broad range of interdisciplinary content
- Access detailed descriptive data never detached from associated images
- Comply with copyright law
- Obtain images for academic publishing
- Use a cohesive interface to search across, upload, and access personal, institutional, and ARTstor core collections
- Use tools to better manage and present images in support of research, teaching, and learning—online groups, shared folders, hyperlinks, etc. that work with campus course management systems
- Export images, high-quality details, and descriptive data to use in Powerpoint or Keynote presentations
- Use in conjunction with JSTOR (particularly familiar to Humanities faculty)
- Export image citations to EndNote, RefWorks, etc.

The handout is shared with any potential image users at every opportunity including orientations, with quarterly workshop attendees, and also made available on the VRC Web site.[36]

Challenge: Find ways to communicate the "why" behind image services with informational handouts, online resources, and publicity to reach more potential users.

Specific examples of working one-on-one with faculty members at UC Irvine—both successful and unsuccessful attempts at engaging patrons—provide a more in-depth glimpse of image users' needs and shed light on a typical campus context.

Thirty minutes from start to finish. An emeritus Comparative Literature faculty member with a new MacBook asked for assistance in finding digital images. He chose the active, hands-on role of driving the computer and the search began on the UC Irvine Libraries "Images" Web site where complete information about all of the image resources available to him is summarized with links.[37] This site includes a content summary, guides and tutorials, as well as information about off-campus access, the visual resources collection, copyright, and workshops. When it was determined that he was looking for the French photographer Atget's work, it became apparent that ARTstor was worth trying with its Eastman House content. He became a registered user, found the images he wanted, and saved them as a group to the ARTstor server. He was directed to the maximize button and the arrows that would allow him to flip through the images in a slide show. He was unsure of access to an Internet connection when presenting, so he downloaded the ARTstor Offline Image Viewer and tried using the image palette for his slide show instead. In less than a half an hour, this retired faculty member walked away a satisfied customer with a finished presentation.

A missed opportunity. A Studio Art faculty member who is close to retirement and therefore reluctant to transition to digital images at this stage in his career teaches an Arts core course. This year he was informed that classroom technology services would no longer support slide projection in the lecture hall large enough to accommodate this heavily enrolled class. ARTstor would be the perfect resource for him to transition to digital images since he would not have to spend a lot of time creating presentations, if he would simply use the existing tools. ARTstor does not have all of the contemporary material he needs since they are presently working on the rights issues, but the VRC could add any additional contemporary images to UC Irvine's hosted collection or he could upload his own images to a personal collection. VRC staff have not yet been able to demonstrate this to him.

Challenge: (1) The younger generation of scholars are generally considered more likely to embrace new technology, but information professionals need to find ways to include everyone in the transition. (2) Make yourself readily available to all and be flexible in trying to assist with processing content and using image services.

Showcasing a faculty personal collection. A new Art History faculty member who studies the Islamic architecture of South Asia has been actively involved in field work since the 1990s and much of her material is in the form of 35mm slides. When she arrived at UC Irvine, the VRC started aggressively scanning the images she needed for instruction. Since the metadata is in her mind and field notes, we provided her with an Excel spreadsheet that maps to our local database so she could provide enough descriptive data to enable her students to find the images online through keyword searches for use in their own research and presentations. Almost 10,000 slides have been processed and the VRC is partnering with her this summer on enhancing the metadata in order to make the whole collection available as core content for all ARTstor subscribers in the coming year. She sees the value of having

her images in multiple resources to disseminate them as widely as possible for enhancing scholarship.

Seizing an opportunity to demonstrate the value of sharing. A History professor came by the VRC's drop-in computer lab to do some last-minute scanning for a class. A discussion ensued while the slides were scanning to determine how the VRC might help with her image needs. The images turned out to be photographs from her personal collection of WWI postcards and it was suggested that she consider sharing these fascinating images. She was shown ARTstor and the VRC staff offered to catalog the material if she could provide minimal data or access to the postcard collection.

Getting help from your peers using Flickr. A faculty member from the Department of East Asian Languages and Literatures who did not have descriptive data for her collection of 1940s-1960s Japanese theater images uploaded her images to Flickr and invited her peers to help identify the images taking advantage of Flickr's social tagging software.[38]

Challenge: Scattered digital image collections are becoming ubiquitous, but most lack metadata. Information professionals need to be proactive in obtaining descriptive information before it is lost or requires more faculty time than it is possible to garner.

Staff support, especially in the areas of image scanning and metadata generation, can help meet image users pedagogical needs and bring personal image collections out of silos and into shared image services. Presently, a UC Irvine VRC curator and librarian are working on a "why metadata" document to help alleviate some of the confusion for those who are new to managing digital images and need to better understand the implications of "going without," that is, building collections with only a filename to identify an image. The starting point for this document is a clever use of images and words stating ". . . because people use words to find images." The other side of the flyer explains in more detail why descriptive data is necessary for online discoverability and who can help on campus.

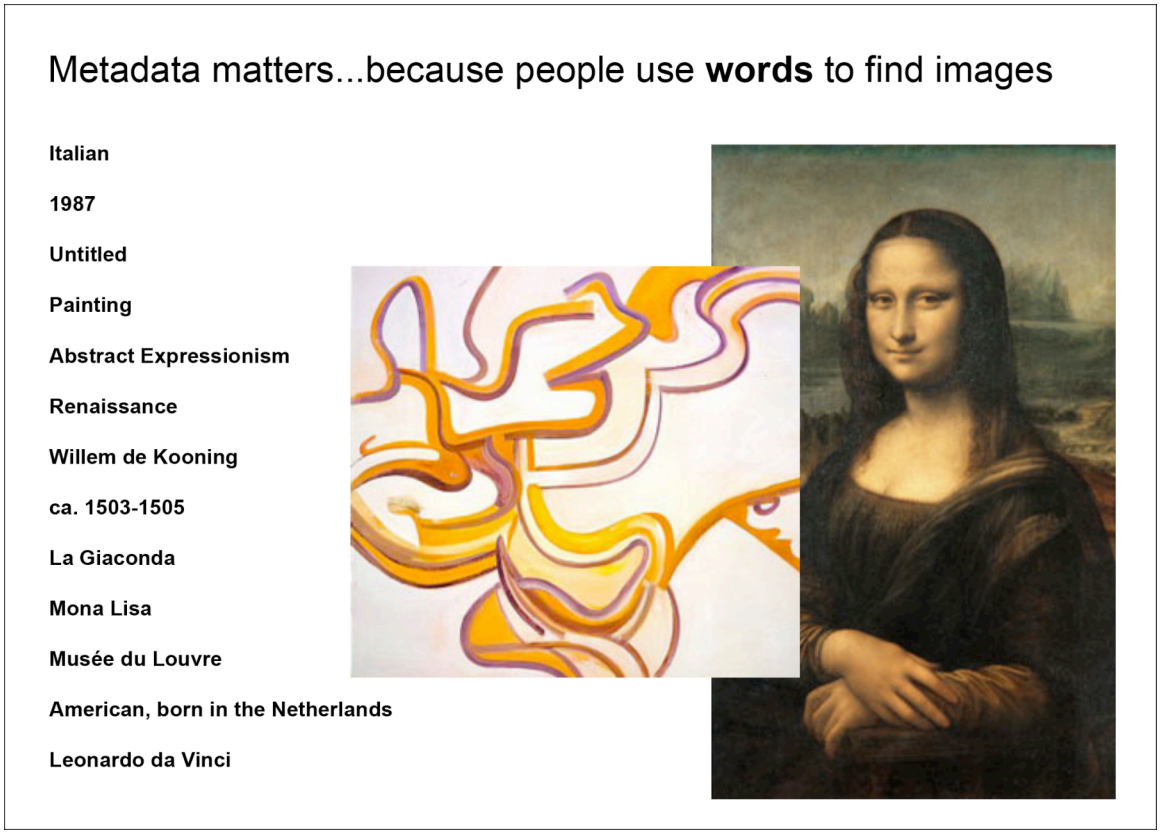

Image from the Metadata Submission Guidelines (MSG) created for UC Shared Images.

Based upon these experiences, it seems that digital image users can be placed on a continuum—from those who are choosing to scan and build personal image collections to those who completely rely on VRC curators to build shared image collections, with many patrons landing at a variety of points in between. At least a portion of a slide collection's traditional patrons are moving away from the shared images model and building personal digital image collections in isolation. Faculty, graduate students, and undergraduate students seem to be doing what is expeditious rather than seeking comprehensive information about their options. Each group poses different challenges when it comes to getting the word out about digital image resources and determining effective uses.

Challenge: (1) To connect with image users in every way we can (from the water cooler conversation to workshops), build reciprocal partnerships, and establish clear communication channels. (2) To help patrons evaluate robust options for managing their personal collections, and to be aware of existing shared resources before recreating the wheel (rescanning an image that already exists in the shared collection.)

It is becoming evident to patrons and information professionals that image services, such as ARTstor, with images, metadata, and tools bundled together, are different from other electronic resources licensed by libraries or images found on the Web. The image user tends to "mine" images from a variety of sources and bring them into the software tools of choice, while ARTstor works on the assumption that users can find most of what they need (or at least the potential is there as it grows) in the ARTstor core content with the tools necessary for image management and presentation. This reversal and convergence of content and tools is what requires a

more active role on the part of the information professional and differentiates image services from other library electronic resources. Patrons are not only trying to retrieve a book or obtain an electronic journal article for their research, they are building collections of images to use in their research and teaching. It is up to information professionals on the front lines to remind image users of the value of shared image collections, including providing information about expanding content, new platforms, updated software, and developing tools.

Challenge: Think deeply about the differences between library resources and image services and enhance services accordingly.

Conclusion

> *The university's future success depends on its ability to act as one system, operating in ways that are as cross-disciplinary, innovative and collaborative as possible to sustain our competitive advantage as the world's leading public research university.*
> —Wyatt R. Hume, Provost and Executive Vice President, Academic and Health Affairs, University of California[39]

UC Shared Images is striving to become a coordinating resource—a hybrid of content, tools, and community.[40] ARTstor is building a high-quality digital library with a large quantity of core images, but the ARTstor platform also allows the necessary spontaneity for the user to build personal collections (with optional sharing), quickly and easily. The UC VRCs are experimenting with the middle ground, moving in didactic content requested by faculty and students along with other curated image collections. This allows for image and metadata quality control as well as the rapid growth and sharing of images from all ten campuses. It melds the best of past attempts to build shared image collections with more of the spontaneity of the present, while also looking to the future. Although it is unlikely there will ever be one-stop shopping for digital images with so many image resources on the Web, UC is going to find out if this effort with ARTstor will provide some approximation of it.

As each campus starts moving image content into ARTstor, it should become evident to image users that if they are not finding what they need in the ARTstor core content, they can request photographic services from the VRC to fill any gaps. As an added bonus, they will also find instructional images being moved into ARTstor by all the UC campuses. As faculty see the images their peers are adding to ARTstor as personal, institutional, and on occasion, ARTstor core collections, it might motivate them to share their own image collections. UC Shared Images is not a static collection of UC-owned and licensed content, but an open-ended, growing image resource. ARTstor statistics indicate that usage rates are three times higher at institutions where institutional collections are combined with the ARTstor core content.[41] Therefore, it is hoped that participation in UC Shared Images will facilitate expanded ARTstor adoption on all the UC campuses.

Yet, the great potential of UC Shared Images is to enable *integrated* collection development across the UC system, reducing redundant effort and providing access to the images faculty have specifically requested. Rather than just putting images together and hoping faculty find them useful, UC can now collaboratively develop

shared collections we know are based on faculty's ever-expanding research that are already widely used in teaching. The effort of collection development will be distributed across all ten campuses, where each understands their own faculty's needs best. CDL's role will be to facilitate communication, decision-making, and standards among the campuses. When image users can see that any images they order from a campus VRC will eventually turn up in ARTstor, we are hoping the true value of such image services will be more fully understood and the age of strategically built shared image collections will have truly arrived at UC.

It is the strategic and holistic nature of this venture that distinguishes UC Shared Images and lives up to the promise of one extended university:

- Ten campuses building image collections in a large and expanding digital library
- Start with the visual resources collections and extend participation to archives, libraries, and museums on each campus
- Allow faculty to build personal image collections in ARTstor with the potential to graduate to the hosted institutional collections (i.e., UC Shared Images)
- Metadata Submission Guidelines encourage quality descriptive data and a consistent experience for image users
- Information professionals wrestle with ongoing issues and develop policy and best practices collaboratively
- Technological development is ongoing allowing for further experimentation
- A community of functional partners support strategic and holistic growth

The success of UC Shared Images will be measured by how broadly and extensively ARTstor and the UC Shared Image collections are used across disciplines at UC and the extent to which this collaboration can reduce redundant effort for institutional collection builders and image users. CDL is relying on campuses to share images used in teaching and to support faculty and students—the end-users. An important next step is to look at how other collections outside UC VRCs might be added and how effectively UC Shared Images is able to foster partnerships among stakeholders. These interdisciplinary relationships are often complex and vary by campus.

Building cohesive relationships among the UC stakeholders (VRCs, libraries, educational technology, etc.) and processes for decision-making will ensure UC Shared Images is viable into the future, regardless of how it develops. Supporting campus autonomy while also providing structure (policy, standards, shared values, and principles) will be an ongoing challenge.

Past efforts indicate that image services are ever-evolving and require active management and forward thinking. UC Shared Images relies on our ability to anticipate risks and trends, to seek ways to preserve effort, and to attract and pursue opportunities for partnering and innovation. A critical component will be to engage in regular assessment to identify both problems and successes and to realign our vision accordingly. For the first time, UC image collections can now be socially constructed by image users, by image professionals, and by ARTstor, all of whom play crucial roles in building an extended image community.

Notes

[1] Clay Shirky, *Here Comes Everybody: The Power of Organizing without Organizations* (New York: The Penguin Press, 2008).

[2] Jennifer Trant and David Bearman, "Educational Use of Museum Multimedia: The AMICO Library," *Visual Resources Association Bulletin* 29, no. 4 (Winter 2002): 72-86.

[3] For more information about Flickr, see http://www.flickr.com/.

[4] David Weinberger, *Everything is Miscellaneous: The Power of the New Digital Disorder* (New York: Times Books, 2007).

[5] For CDL's Image Service Strategic Planning team members, see http://www.cdlib.org/inside/projects/image/#Groups.

[6] The UC Visual Resources Group consists of the following UC campus lead curators: Berkeley, Architecture, Jason Miller; Berkeley, Art History, Jan Eklund; Davis, Leah Theis; Irvine, Arts, Loy Zimmerman; Irvine, Humanities, Maureen Burns; Los Angeles, David Ziegler; Merced, Emily Lin; Riverside, Madelyn Millen; San Diego, Vickie O'Riordan; San Francisco, Kathleen Cameron; Santa Barbara, Jackie Spafford; Santa Cruz, Kathleen Hardin. We gratefully acknowledge these terrific colleagues for all their important contributions to group efforts as well as their extended staff who are making the first phase of UC Shared Images a reality.

[7] For more information about ARTstor, see http://www.artstor.org/index.shtml.

[8] For a sampling of UC's cultural resources, see http://www.universityofcalifornia.edu/cultural/welcome.html.

[9] For more information about early UC digital image projects, see Maureen Burns, "From Horse-drawn Wagon to Hot Rod: The University of California's Digital Image Service Experience," *Journal of Archival Organization* 4, no. 1/2 (2006): 111-139. For more summary information about UC image projects and outreach efforts, see Maureen Burns and Rina Vecchiola, "What We Want (and Don't Want) to Know about Faculty Using Digital Images: Lessons Learned at the University of California" *Art Documentation* 24, no. 2 (Fall 2005): 7-15.

[10] Eileen Fry, "From Lantern Slides to Image Presentation Systems: A Discipline in Transition," *Indiana Libraries* 26, no. 2 (2007): 15-19.

[11] A survey of image collections in the UC Libraries was a part of the 2003 Digital Visual Resources Task Force report http://209.85.173.104/search?q=cache:zvZiSiPFZNAJ:libraries.universityofcalifornia.edu/sopag/vrtf/VRTF_Report_082603.doc+sopag+vr+task+force&hl=en&ct=clnk&cd=2&gl=us and subsequent informal surveys of the UC VRCs have helped to estimate the quantity of images archived in the UC system.

[12] For more information about the California Digital Library, see http://www.cdlib.org/.

[13] For more information about LUCI, see Maureen Burns and Loy Zimmerman, "`If You Build It, Will They Come?' The Library of University of California Images in Transition," *Visual Resources Association Bulletin* 29 (Winter 2002): 60-68.

[14] The LUCI Web site can be found at http://vrc.ucr.edu/luci/index.html and information about the participants can be found there.

[15] For more information about the Image Service Demonstrator Project, see http://www.cdlib.org/inside/projects/image/image_demo_project.html. Information about Luna's *Insight* software can be found at http://www.lunaimaging.com/insight/index.html.

[16] For more information, see UCSD's original announcement at http://www.ucsd.edu/portal/site/Libraries/menuitem.346352c02aac0c82b9ba4310d34b01ca/?vgnextoid=d9cf2cc34eba6110VgnVCM10000064b410acRCRD and the present description in ARTstor at http://www.artstor.org/what-is-artstor/w-html/col-slide-gallery.shtml.

[17] Information about UC Shared Images is being built at http://www.cdlib.org/inside/projects/image/.

[18] Strong has written two thought-provoking articles about strategic planning. Bart Strong, "Strategic Planning for Technological Change," *EDUCAUSE Quarterly* 30, no. 3 (2007) http://connect.educause.edu/Library/EDUCAUSE+Quarterly/StrategicPlanningforTechn/44837. *Bart Strong, "Strategic Planning: What's So Strategic About It?"* EDUCAUSE Quarterly 28. no. 1 (2005) http://connect.educause.edu/Library/EDUCAUSE+Quarterly/StrategicPlanningWhatsSoS/39898.

[19] For more information about the Berkeley Museum Informatics Project and the digital collections they support, see http://www.mip.berkeley.edu/mip/index.html.

[20] For more information about the UCI Libraries, see http://libraries.universityofcalifornia.edu/.

[21] This informal group of stakeholders began with the formation of a listserv during the Demonstrator project and continues to expand with the image-interested from all the UC campuses.

[22] For more information about this planning group, see http://libraries.universityofcalifornia.edu/sopag/.

[23] Max Marmor, "ArtSTOR: A Digital Library for the History of Art," *Journal of Library Administration* 39, nos. 2/3 (2003): 61-68.

[24] For more information about the VRA Core see http://www.vraweb.org/projects/vracore4/index.html and for Cataloging Cultural Objects see http://www.vraweb.org/ccoweb/cco/index.html.

[25] The Metropolitan Museum of Art is presently making such images available in ARTstor through the Images for Academic Publishing project, see

http://www.artstor.org/what-is-artstor/w-html/services-publishing.shtml. The Getty Museum and Victoria and Albert Museum have also been promoting this type of access and it is hoped that other museums will follow these leads.

[26] For an interesting article on current copyright issues, see Gretchen Wagner, "Sharing Visual Images for Educational Use: Finding A New Angle of Repose," *EDUCAUSE Review* 42, no. 6 (2007) http://connect.educause.edu/Library/EDUCAUSE+Review/SharingVisualArtsImagesfo/45225.

[27] For more information on OAI, see http://www.openarchives.org/.

[28] The charge of the Shared Metadata Working Group can be found here http://www.cdlib.org/inside/projects/image/smwg_charge.pdf.

[29] For the UC Shared Images Metadata Submission Guidelines, see http://www.cdlib.org/inside/projects/image/msg_ucsi.pdf.

[30] For more information on the Digital Preservation Repository, see http://www.cdlib.org/inside/projects/preservation/.

[31] A good example of a UC image collection being accessible in more than one place on the Internet is the Online Archive of California available at http://www.oac.cdlib.org/. It is also available through Calisphere at http://www.calisphere.universityofcalifornia.edu/ and at the Museums of the Online Archive of California http://www.bampfa.berkeley.edu/moac/search.html. The images were included in the Demonstrator project as well.

[32] The Berkeley campus is presently experimenting with OAI harvesting and the other UC VRCs hope to learn from their experience.

[33] For the CDL newsletter, see http://www.cdlib.org/news/cdlinfo_newsletter.html.

[34] Several articles have been published sharing UC's early experiences using ARTstor including the following: Lynn Cunningham and Kathryn Wayne, "Images Matter: The Introduction of ARTstor at the University of California Berkeley," *Against the Grain* (September 2006): 59-62. Wendy, Edelstein, "The Right Picture: Finding It, Organizing It, Showing It, Storing It. . . ," *Berkleyan* (October 26, 2005) http://www.berkeley.edu/news/berkeleyan/2005/10/26_artstor.shtml. Chris, Hsiung, "Art Imagery brightens Lectures," *The Daily Californian* (November 23, 2005) http://www.dailycal.org/sharticle.php?id=20551. Paula Murphy, "ARTstor and UC Image Service: Integrating Images in Instruction Gets Easier," *Teaching, Learning, and technology Center* (December 2005) http://www.uctltc.org/news/2005/12/images.html. "Participant Viewpoints: University of California, Berkeley," *ARTstor Newsletter* 7 (Fall 2006) http://www.artstor.org/info/news/issue7.pdf.

[35] These workshops are sponsored by and offered through UCI's HumaniTech® http://www.humanities.uci.edu/humanitech/index.php, a department serving Humanities faculty and graduate students by providing a number of services that facilitate the discussion and use of technology in teaching and research. UCI's Electronic Educational Environment https://eee.uci.edu/workshops/, which supports

the campus learning management system, offers ARTstor workshops too. Jeff Schneidewind, the manager of UCI's Science Library Interactive Learning Center, teaches the latter and is a terrific ARTstor support partner on campus.

[36] For links to handouts and other information, see UCI's Visual Resources Collection Web site at http://www.arts.uci.edu/vrc/.

[37] For UCI Libraries' Images Web page, see http://www.lib.uci.edu/online/subject/subpage.php?subject=images.

[38] To view this collection and assist with this cataloging effort, see http://www.flickr.com/photos/8899119@N05/.

[39] Wyatt R. Hume, "A message to UCOP employees from Provost Hume and Executive Vice President Lapp," 10 March 2008, distribution list (10 March 2008).

[40] Shirky, *Here Comes Everybody*, 117.

[41] This information was obtained at the ARTstor Users Group meeting at the annual conference of the Visual Resources Association in San Diego in March 2008. The State University of New York system, for example, has also been building and sharing ARTstor hosted collections. For more information on ARTstor hosting, see http://www.artstor.org/what-is-artstor/w-html/services-hosting.shtml.