Collaborating to Build Digital Teaching Collections: A Library/IT Partnership

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Background

In 2005, Reed College's Library and Computing & Information Services (CIS) departments worked with Visual Resource Collection (VRC) staff to co-author a successful grant proposal to develop a centrally managed, flexible, and sustainable digital asset management (DAM) system for instructional media. At the core of the initiative is a goal to create image collections that are fully integrated into the curriculum, are readily accessible to faculty members and students, and offer the potential for resource-sharing with other institutions.

The evolving transition from analog slides and projectors to digital images and display systems is well documented in the library, visual resources, and scholarly art history literature (Bartlett and Roux 2007, Carlson 2005, Durran 1997, Fry 2007). Since access to high-resolution digital media in networked environments became accessible in the nineties, several potential advantages of digital images over analog slides have become evident. These include enhanced viewing capabilities (zooming and panning), easy access to digital images outside of the classroom for simultaneous use by multiple individuals, increased

flexibility in the organization and arrangement of image groups, and a wide array of possibilities for annotating images and integrating them with other media to place them within a pedagogical context. As with other new technologies, some individuals responded to digital imagery by opting to stay with analog, while others became early adopters. Interest in the use of digital images continued to increase, and recent years saw the transition to digital progressing from desirable to necessary as a result of the growing obsolescence of analog slide projection equipment. In the broader landscape, over the past decade numerous studies and articles have highlighted the increasing prevalence of digital resources in higher education (Harley, Henke, and Lawrence, 2006; Kemp and Jones 2007; McMartin, et al. 2008). In this new multimedia-rich climate, an increasing number of faculty members across the curriculum in higher education have taken an interest in using digital images into their teaching (Green 2006, Shonfeld 2006). As Nitecki and Rando (2004) conclude, based on a study of the use of digital images among American Studies faculty members at a large university, "digital images present a powerful format for the presentation of visual information" (119). This

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includes a complex range of image uses, such as casual illustrations to create visual interest, a means of supporting evidence, and the use as primary evidence of original images created during a specific time period.

Though the long-term goal of Reed's DAM project was to enhance access to digital images across the curriculum, the primary objective of the grant phase was to enhance support for Reed's interdisciplinary humanities program. Humanities 110, a year-long required freshman course, examines the development of culture in classical Greece and Rome and the Judeo-Christian tradition. About twenty faculty members in classics, art, history, language and literature, philosophy, and religion team-teach the course, which includes a large-format lecture component followed by smaller faculty-led, discussion-oriented conference groups. Assigned readings include primary source historical/literary texts, as well as critical studies of archaic art and classical antiquities. Traditionally, a handful of lectures each academic year have included an art history component. The VRC would provide to faculty slide carousel image sets to accompany these lectures. With the growing interest in the use of digital media, Hum 110 faculty have demonstrated an interest in expanding their use of images beyond art history topics, incorporating digital images instead of slides, and providing students with ready access to the images outside of class.

Prior to the inception of the DAM grant in 2005, the college was already facilitating faculty use of digital images via several different mechanisms. The library had subscribed to the ARTstor image database and CIS hired a dedicated academic web developer. In 2003, an instructional technologist in CIS began working with the Visual Resources Librarian in the VRC to run a pilot of Extensis Portfolio, a commercial digital asset management product popular in the creative industry.

Through Portfolio, the VRC had made available in digital form about 9,000 images from their collection, including digitized slides and licensed images. The VRC and CIS had also digitized the personal slide collections of various classics faculty members, which, together with some scanned images, comprised the Portfolio Classics Image Database. A handful of other faculty members, from the English, history, and anthropology departments, had worked with CIS to develop their own personal image col-

lections using Portfolio. The resulting total volume of images in Reed's Portfolio system numbered around 16,000. At that time, one instructional technologist had the primary responsibility for implementing these image collections. Each collection was developed separately as a standalone database. Only two of the collections had a front-end interface that was accessible via the WWW. One of these was the Hum 110 Image Galleries, a selection of images from the Portfolio Classics Image Database. During this time period, a handful of Hum 110 faculty members began creating separate course image sets, or "galleries," in ARTstor. Additionally, CIS had created various other online study aids heavily comprised of visual images. All of these resources were linked from the Hum 110 course web page.

The DAM project was initiated when faculty and staff began to voice concerns about the difficulty of using, and supporting the use of, digital images in teaching at Reed. Their difficulties can be distilled into the following four main points, (which include examples specific to the Classics collection and Hum 110 course):

- Faculty and students were having difficulty accessing images; *For Hum 110 faculty and students, the proliferation of links to image sets on the course web page was becoming increasingly hard to navigate. Connecting to the Portfolio server was cumbersome and confusing for some, and ARTstor demonstrated poor performance in Reed's Mac-based environment (such as slow load times and system crashes).*

- Faculty were confused about how to add images or create new resources; *There were a baffling number of different systems in use at Reed that were being managed by different entities. It was hard for faculty to know whom to call upon for support, and the systems were challenging for staff to manage effectively.*

- Faculty were frustrated by inconsistent image quality, and many duplicate images; *Though ARTstor represents an impressive collaboration on the part of universities and museums, the integration of many collections with little weeding or selection has led to complaints from users about inconsistent image quality and a high number of duplicate images. In a similar vein, the faculty collections that CIS and the VRC helped digitize and add to the Classics Image Database also contained a high level of poor quality and duplicate images.*

- Difficulty finding relevant or useful images, due to gaps in the content, and problems with the

available metadata and index terms; *Though many criteria play a role in the potential effectiveness of a digital image database, academic user studies illustrate that adequate content is near—if not at—the top of the list (Pisciotta, et al. 2005, 37). From its inception ARTstor's scope and access to a high volume of images has been impressive, but custom-built collections at Reed still offered a potential level of relevance to local users unmatched by ARTstor. That said, insufficiency and inconsistency of data hampered the effectiveness of both ARTstor and local Portfolio collections. In the case of ARTstor, cataloging practices differed widely among the contributing institutions, and little to no effort at standardization was visible in ARTstor as a union catalog. Reed's local collections faced similar problems, since the metadata structures and catalog practices for each database were separately implemented and managed by either the VRC or CIS. In the case of the Classics collection, the bulk of the cataloging and data entry was being carried out by students with minimal training and supervision. This led to frequently erroneous, and poor quality metadata. Additionally, controlled vocabularies were under-utilized, so there was a high level of inconsistency across and within the local collection data.*

Selecting a Digital Asset Management System

In the past two decades an array of digital asset management solutions have become commercially available, with a wide range of features. Selection of a DAM solution is made problematic by the fact that each product offers strengths and weaknesses in particular features. Because of this, many large universities have developed software specifically to meet local pedagogical and instructional needs. A handful of these institutions have then made these in-house solutions available commercially or through open source models. As a small college, Reed possesses a high degree of technical expertise, but lacks the overall staff and technical resources necessary to develop this type of in-house software or maintain an open source product. Funding for purchase of a commercial digital asset management product was therefore included in the grant proposal. Staff members from the Library, CIS, and the Visual Resources Collection, as well as some faculty members evaluated four products: CONTENTdm, Luna Insight, MDID, and Almagest. CONTENTdm was selected because it offered: an accessible web-based platform that

TABLE 1 CONTENTdm comparison with other systems in use at Reed			
	Extensis Portfolio	**ARTstor**	**CONTENTdm**
Extensible API	No	No	Yes
Web-based with customizable user interfaces	Limited web-based functionality	Web-based but not customizable	Yes
Cross-collection search functionality	No	Yes	Yes
Local Control Over Metadata	Yes	No	Yes
Local Control Over Image Quality	Yes	No	Yes
Local Control Over Content/ Collection Development	Yes	Limited – can add, but can't delete/weed	Yes
Zoom & pan tools	Yes	Yes	Yes
Slideshow/Display tools	Only in the client software	Yes (online & offline)	Yes (online only)
Multimedia repository	Yes, with limited formats	No	Yes
User-created Galleries	Yes	Yes	Yes, but very limited
"Drag & drop" capability to move images	Only in the client software	Yes	No

doesn't require use of a client application; the ability to customize web interfaces and develop software extensions; built in tools for creating both standardized and custom/local metadata; a PHP- and html-based query language that supports the creation of database-driven browsing menus; cross-collection search functionality; support for a variety of digital media, such as text, audio, and video; and a robust academic user community. Despite its strengths in these areas, CONTENTdm was weaker compared to the other DAM systems and ARTstor with regard to teaching tools for the organization, arrangement, and annotation of image sets for use in class. Part of CIS' role in the collaboration was their commitment from the outset of the project to develop customized tools and extensions as needed. This would prove particularly important when it became clear that enhancing classroom preparation and display tools for teaching would be critical to the success of the project.

Collection Development and Scope

Enhancing support for the Hum 110 intensive year-long course on the development of western civilization was a major challenge of the DAM project. The course is team-taught by roughly twenty professors from a variety of arts and humanities disciplines; the group therefore includes subject experts (classicists) as well as non-experts, and faculty members accustomed to integrating digital images into their teaching (for example, art historians) as well as those who may not have previously taught with images at all. The Hum 110 teaching staff comprises a cross section of tenured, tenure-track, and visiting faculty members, such that participating faculty members may possess varying levels of familiarity or comfort with new technologies. User studies in the literature highlight the fact that differences such as these tend to have a significant impact on individual preferences regarding searching and browsing in image retrieval systems (Frost, et al. 2000; Matusiak 2006; Pisciotta, et al. 2005).

Addressing these needs within the context of the creation of a new campus-wide digital image system required a high degree of collaboration between staff and stakeholders. The DAM grant included funding to bring on new staff to help manage the software and create collections: two new positions included a digital assets librarian and a digital collections assistant. In the initial phases of the project, a core DAM work-

group was defined comprising the visual resources librarian and the digital collections assistant from the Visual Resources Center; the director of reference and instruction and the digital assets librarian from the library; and the chief technology officer and the instructional technologist responsible for the Portfolio system from CIS. Several separate workgroups were also created to address topics such as Standards, User Interface Development, and Assessment and Evaluation. One of the first tasks of the core DAM workgroup was to determine how existing and future collections should be integrated into the DAM system, in order to maximize benefit to campus users and allow effective administrative oversight of the collections by staff. An overarching plan for the addition of content to the DAM had been defined in the grant proposal as follows:

• Migrate existing digital images from Portfolio to the new CONTENTdm DAM system;

• Import new images licensed from digital image vendors;

• Continue to import faculty-requested images on an ongoing basis, including digitized slides from the VRC slide collection; newly digitized images from books via scanning and copystand photography; faculty photography; and some integration of public domain digital images from other publicly accessible collections.

• Enhance support for faculty members already working with images, as well as initiate new faculty collaborations.

Despite the fact that fundamental collection development goals were well defined, the DAM group soon discovered that selecting the most effective method to integrate and deliver the images to the various audiences on campus was not so straightforward. Decisions were complicated by technical questions relating to the new system's capabilities, and questions regarding how to structure descriptive metadata for best access by users.

The DAM workgroup wanted to integrate the two existing Portfolio image collections, Art and Classics, so that faculty and students campus wide could access them as a centralized image bank, without sacrificing any value to the specialist audiences: Art, Classics, and Hum 110. Although there was a high degree of subject overlap in both image collections and at least a surface similarity between metadata standards, the two collections were effectively separate resources.

This problem is not uncommon, as Cromwell-Kessler (1998) explains:

> A major benefit of the emerging networked environment is the potential to integrate distinct but complementary information resources. …The primary obstacle to integration, however, lies in the structure of different metadata systems, which may be composed of diverse data elements functioning at different levels, and designated in widely varying ways. Variant systems are often found even within a single subject community where competing metadata systems have developed in isolation—and where, before networked access, uniformity was deemed unnecessary. (19)

Because CONTENTdm, unlike Portfolio, offers cross-collection search functionality, this integration could be achieved on some level even if the two collections were created as separate resources, with separate metadata structures, in the new system. This would have been possible because CONTENTdm provides the capability to map each field in each collection to Dublin Core metadata fields, which then provides the basis for crosswalking[1] between the various collections, so that a user can search one or multiple collections simultaneously. There were two main drawbacks to this approach: users searching across collections would not be able to view the custom metadata field labels for each collection (as they would view the Dublin Core fields instead), and cross-collection searching might retrieve duplicate image records since there was a small level of overlap across the two collections, especially in canonical western paintings of classical mythology. The latter point raised a particular red flag, since users had already expressed frustration about encountering duplicate images.

An alternative collection integration option was to merge the Art and Classics collections into "one big collection" with one metadata structure. While merging the metadata structures was daunting, it made sense that doing so would help streamline cataloging and data consistency in future. From a technical standpoint, though perhaps challenging, it would also be feasible with the new DAM system to create various custom front-end interfaces for the Art and Classics image subsets within the "big collection." This would be achieved through the use of CON-

TENTdm's CQR feature (Custom Queries and Results), which supports the programmatic retrieval and display of specific items based on structured metadata tags that can be dynamically queried in a customized web interface. This capability was significant, since the objective of the DAM project was to create both a general-usage image resource accessible to all faculty and students, as well as learning resources tailored for target departments and courses. Balancing the needs of the generalist and specialist user is one of the aspects that typifies the creation of a digital image teaching system in an interdisciplinary context. Pisciotta, et al. (2005), reporting on Penn State's image user study, comment on this same phenomenon:

> An interdisciplinary image service may need to address two distinct audiences: a very large group of occasional or light users and a much smaller group of frequent and intense users. While this probably may be said of any service, the problem of serving a small group of very intense users of images will probably have disciplinary characteristics.(38)

Ultimately, the DAM group selected the "one big collection" approach in order to create a robust campus-wide image resource, with the caveat that CIS and the library would work together to design and create metadata-driven custom user interfaces as needed. To carry out this goal, the DAM Standards workgroup, comprised of library and Visual Resources Collection staff, worked together to integrate the existing Classics and Art metadata structures into one institutional data dictionary. This was challenging because, despite the fact both collections were based on the VRA Core data standard developed by the Visual Resources Association, the staff responsible for administrating each collection had interpreted and implemented the VRA standards quite differently. Ultimately, the DAM Standards workgroup created a new custom application profile[2] that employed a shared set of elements drawn from the VRA Core, while also allowing for the addition of local fields needed to support the Classics and Hum 110 curriculum and custom web interface.

Building User-Centered Digital Collections
User-Centered Design

User-centered design has been extensively practiced and written about over the past two decades. To put

Reed's DAM project into context, it will be useful to look at some definitions from the computer science and library science literature. In the Berkshire Encyclopedia of Human-Computer Interaction, Abras, Maloney-Krichmar, and Preece (2004) define user-centered design as "a broad term that describes design processes in which users influence how a design takes shape" (763). Specific user involvement, however, may take a variety of different forms. For example, based on Lindermeier & Stein's "User-Task-System" design model, Stephenson (1999) suggests that systems designers' start by posing the following questions to "assist in developing a user-based model for directing development of image delivery systems" … :

• For whom are we building our image delivery system?

• What is it that we are building and for what purposes do those users want to use it?

• What functionality do our users need to use what we build? (422)

Stephenson goes on to discuss how "mechanisms to test those assumptions can be built into the iterative system design process," incorporating "a variety of quantitative and qualitative techniques including log analysis, online user surveys, usability studies, interviews, and focus groups" (422-423). Finally, in "participatory design," Abras, Maloney-Krichmar, and Preece explain, methods may be employed that "involve users much more completely, recognizing users as partners with designers throughout the design process" (763), with the end result being that "users are in essence co-designers" (767). According to Pisciotta, et al. (2005), participatory design is an iterative process: "A user-centered approach to planning promotes a conception of image delivery that benefits and grows from the participation of users and creates systems that are dramatically shaped and continually reshaped by users" (21).

Collaborative Design and Production

The core DAM workgroup spent the bulk of the first year of the project working together to integrate metadata structures and agree on collection standards; testing the system; and migrating and importing content. At the end of the first year, though all legacy and new images had yet to be added to the system, there was sufficient content in the system to allow project staff to begin the design process for the Classics and Hum 110 resource. The timeline for the project was as follows:

• Two faculty focus groups were conducted in late spring to determine user needs;

• A working group was convened over the summer comprised of four project staff members, two faculty subject experts, and one student subject expert; Work then began on metadata and content enhancement, as well as software modification and interface design;

• A third faculty focus group was held in late summer to view the new prototype;

• The new Classics Image Database website was finalized, and launched for fall semester;

• A faculty survey was executed at the end of fall semester;

• Two student focus groups were held in January;

• In spring/summer project staff initiated work on the next DAM project resource: a customized interface for art faculty and students;

• Plans are in the works for further evaluation of user needs regarding the Classics Image Database.

Project staff conducted two focus groups to gather feedback about the tasks and functionality faculty members desired from the new digital image system and customized interface. Specific faculty members were invited to participate: two tenured Classics professors and a former visiting Classics professor who had contributed content and overseen some of the cataloging in the existing Portfolio Classics Image Database; a new tenure-track Classics faculty member interested in using digital collections; a new tenure-track Political Science faculty member teaching Hum 110 and interested in using digital collections; and a tenured English professor who was experienced at teaching Hum 110, an early adopter of digital media, and an avid ARTstor user. Project staff members from the three collaborating departments—the Library, CIS, and the VRC—also attended the groups. Rather than being moderated by one specific individual, the focus groups were co-facilitated by staff from the Library and CIS. This was important for two reasons: to ensure that participating staff—with different backgrounds and perspectives—came away with a solid understanding of users' needs, and to help demonstrate to faculty members how the design and development responsibilities were to be shared among the new collaborative project staff.

The feedback from the first faculty focus group confirmed many of the existing assumptions of the

DAM workgroup. ARTstor was disliked because of its poor technical performance on Macs and significant gaps in the content, Portfolio was disliked due to the lack of a user-friendly web interface, and both systems were perceived negatively with regard to poor or insufficient data for finding images. What the focus group participants desired from the new digital image system also largely reflected the understanding of project staff. Participating faculty members wanted: a high volume of high quality images of relevance to the Reed curriculum; structured, relevant metadata for reliable search and retrieval of images; effective and user-friendly browsing menus for Hum 110 that would highlight images of relevance to the course (of particular important to the non-subject-experts); and flexible presentation tools for in-class display that included side-by-side comparison capabilities. New ideas were also presented; for example, DAM staff discovered that while focus group participants wanted preset browsing menus and image sets, they also strongly valued ARTstor's capability to create and share personal image galleries. One participant—one of the subject experts—had a strong personal preference for complex searching, and wanted to ensure an advanced search capability would be available in addition to the browsing options. Another participant—the early adopter—valued being able to add her own content to ARTstor, and was interested in the possibilities for student annotation and tagging. All participants favored one individual's suggestion of creating study guides to provide context for the images, and help students learn to analyze visual content. This suggestion also sparked a discussion of the ways in which the study guides might potentially aid not just the students, but also the non-subject-expert faculty: more in-depth discussion of images might take place in conference, and images might more frequently be integrated into conference as "visual culture," instead of just "art days."

Notably, these initial focus groups served not just to gather input from faculty members, but as actual opportunities for collaborative development. Participants viewed the new CONTENTdm system in its "out of the box" state, as well as a few selected examples of customized CONTENTdm websites and collections from other institutions. Participants particularly liked the simple navigation and browsing menus on the IDEAS (Image Database to Enhance Asian Studies) Project website,[3] and it became an infor-

mal template for the design of the new Classics and Hum 110 website. At the culmination of the focus group discussions, a rough outline of the navigational browsing menus for the new website had been hammered out, a series of topics had been enumerated for the study guides, and the group had discussed their general expectations for the study guides.

Following the initial focus groups, a workgroup was formed that included: two of the Classics faculty members from the focus groups; the digital assets librarian; the digital collections assistant from the VRC; two web designers/programmers from CIS; and one student research assistant. The project grant award included funding to cover stipends for participating faculty members, as well as student assistant wages. This level of financial planning for personnel was significant to the success of the project; the staff members who co-authored the grant proposal anticipated that the participation of local subject experts would be required in order for project staff to build a successful image system for teaching. In a series of collaborative meetings throughout the summer, as well as breakout work conducted among pairs and individuals, the DAM Classics/Hum 110 working group:

• Fleshed out categories for website browsing menus and associated controlled vocabularies; *Building on suggestions from the faculty focus groups, the two Classics professors in the Classics Image Database working group were largely responsible for fleshing out the structure for the browsing categories on new website. These included: HUM Lectures, a series of galleries mirroring the images shown in lecture; HUM Topics, highlighting various topics relevant to the course, with key faculty-selected-images for each topic; Era; Geographic Region; and Artifacts. The DAM Standards workgroup had decided to implement the Getty Institute's Art and Architecture Thesaurus (AAT) standardized vocabularies for the VRA Core fields in the "big collection." However, Library staff determined that the domain of classical studies is under-represented in the AAT and other standardized vocabularies for the description of visual works of art and artifacts. For this reason, as well as to increase the level of ownership in the new Classics Image Database, Library staff opted to help the professors create local controlled vocabularies for each category.*

• Merged, assessed, inventoried and weeded existing and new Classics images; *With thousands of new high-quality vendor–licensed images in hand, project staff wanted to identify and weed out duplicate images of*

Fig. 1. Classics Image Database Launch Page
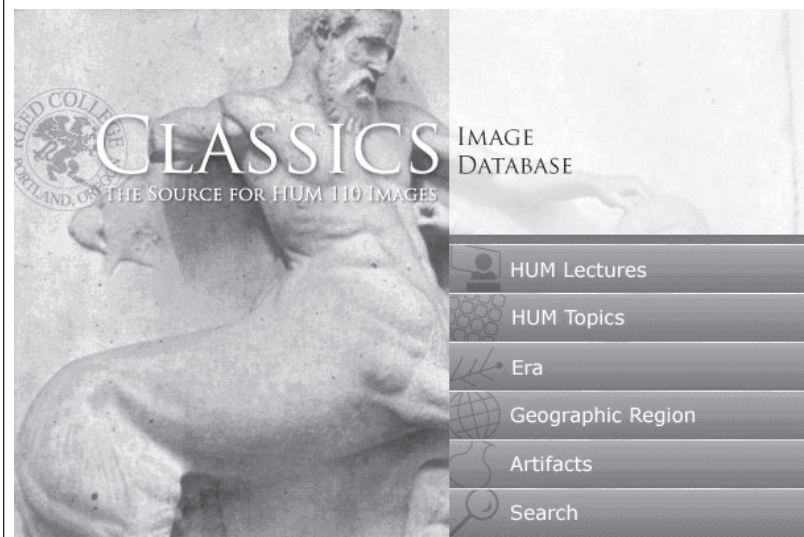
lower quality from the Classics images in Portfolio before importing both collections into CONTENTdm. Records for the new Saskia images licensed from Scholar's Resource were loaded into Portfolio, so that the student research assistant could conduct a thorough inventory, followed by weeding the Portfolio Classics images. This activity was also useful in identifying potential gaps in the merged collections.

• Imported remainder of legacy and new licensed Classics images into the new DAM system; *While development of the website was underway, the digital assets librarian and digital collections assistant finished migrating the Portfolio Classics images to CONTENTdm, as well as segmenting out and loading the Classics images from the newly purchased Saskia image set.*

• Cataloged the image records, in order to support the effective retrieval of images from the new website browse menus; *Satisfying faculty members' request for structured, relevant metadata to facilitate the effective retrieval of images via the new browsing menus required extensive data editing and new cataloging by subject specialists. Library staff utilized a custom "Subcollection" field to tag all Classics images in order to segment them from the bigger Art and Architecture Collection and facilitate their integration into the Classics Image Database via CQR. The digital collections assistant was also centrally involved in correcting errors and standardizing data in both the Portfolio and Saskia classics images. The bulk of the cataloging for the new custom Classics and Hum 110 fields, as well as significant enhancement of*

descriptive notes was carried out by one of the Classics professors and the Classics student research assistant.

• Wrote and designed the layout for the first study guide; *The two Classics professors collaborated extensively to write and design an initial study guide called "Reading Greek Vases." They co-authored the text, selected accompanying images from the database, and sketched out the preliminary design. The academic web specialist worked closely with them to incorporate their design ideas into the final layout.*

• Developed the customized "My Workspace" extension of the CONTENTdm My Favorites feature to enhance support for arranging and organizing image sets for use in teaching; *Out of the box, My Favorites did not allow users to save more than one image set, or gallery, or to access their saved images on different computers. The academic web specialist and a programmer from CIS collaborated to integrate these new features with the existing My Favorites functionality by creating a separate database to store additional information about users and their galleries.*

• Designed a prototype website for Classics/Hum 110; *The academic web specialist worked closely with Classics faculty and the digital assets librarian to organize the previously created browsing menus into a website that would be attractive and easy to navigate. A key component of their work involved seamlessly integrating the custom Classics Image Database web template with CONTENTdm's standard templates for item viewers and search results pages.*

Testing, Launch, Evaluation and Feedback

At the third faculty focus group, conducted when the prototype was ready to view, participants responded positively to the new interface. They particularly liked the "My Workspace" functionality, which allowed them to create and save multiple image sets, and access them from any computer. A couple of feature requests were touched on that would require a high degree of custom development, such as the capability to refine searches across categories (e.g. faceted browsing), and an integrated feature for faculty to add their own images. Additionally, in the case of faceted browsing, vendor communication indicated a high likelihood

that future product releases would incorporate this feature. When staff members communicated this information to faculty members, neither of the features was seen as requiring immediate implementation.

After the prototype viewing, Library staff on the project finalized the bulk of the cataloging necessary to support the Classics Image Database website browsing menus. The first of the study guides was put in place, and the second was in progress. Based on the pace of the work, and availability of funds, a decision was made to retain the student research assistant as staff and the former visiting Classics professor on a contract basis. This meant that intensive cataloging and work on the remaining study guides could carry on in the background as the new resource was being implemented. In preparation for launch of the new image system and Classics Image Database website, the digital assets librarian and the academic web

specialist also collaborated on the creation of custom help documentation. This documentation covered topics specific to Reed's custom implementation of CONTENTdm (how to browse and search the custom website; and how to create galleries in the new My Workspace), and was integrated into the Classics Image Database website, as well as utilized for handouts in Hum 110 faculty trainings in the fall. Prior to the start of the semester, DAM staff also created a new group listserv to streamline communication and facilitate the process of responding to questions from faculty members.

Within the first year of launching the new digital image system, CONTENTdm's slideshow tool was utilized by half of the Hum 110 faculty members who showed images in lecture. The other half opted to use Power Point or analog slide projection to show images, and Library and CIS staff worked together with them

Fig. 2. Customized My Workspace extension of the CONTENTdm My Favorites feature

to ensure that their lecture images were also viewable on the Classics Image Database "Lecture" page. This process required a hybrid of cataloging and adding new content to the system: lecture images already present in the DAM system were tagged with the appropriate metadata in the custom "Hum 110 Lectures" field, while other new images had to first be acquired and then cataloged. DAM staff also helped faculty members prepare slideshows and in some cases provided technical assistance during the lecture itself. A majority of the Hum 110 faculty members who used CONTENTdm to show images in lecture were satisfied with the system, while one individual was dissatisfied with capabilities of the slideshow viewer. DAM project staff worked closely with the latter individual to document her suggestions. Her comments would later prove to be consistent with feedback from the Art History department, resulting in Reed's decision to develop a customized image and slideshow application.

At the end of the launch semester, a usage and satisfaction survey was distributed via e-mail and paper copies to Hum 110 and Classics faculty. Fifteen of the twenty-eight faculty members participated in the survey, and a majority of those respondents had used the Classics Image Database in its first semester. Used by a majority of participants, the Lecture galleries were the most popular component of the new website, followed by the search feature (eight people) and the "Hum 110 Topics" menu (seven people). Usage of the study guides among Hum 110 faculty was low: just three individuals had utilized them. Open-ended responses gathered in the survey reflected an overwhelmingly positive response to the new Classics Image Database website, including comments such as:

• I think it is fantastic—far and away the best visual materials we have had and all of the staff personnel who have worked on it have done an excellent job, including teaching us lame faculty members how to use it and making sure every need was attended to.

• I feel confident about my actual ability to use the system…I've also found that its ease of use has encouraged me just to browse the slides more, even without a specific pedagogical purpose. I am, in short, quite happy with the system.

• Excellent easy access for showing students images in class, for which I'm very grateful.

Some constructive comments were also made, primarily regarding collection development sugges-

tions. Direct interactions with Hum 110 and Classics faculty plus the results of the survey led DAM project staff to conclude that the new system launch was a success. It will be useful to repeat the survey again in the second year of the Classics Image Database, and it is likely that new questions will be added to elicit specific feedback about how to increase the visibility or relevance of the study guides.

In January of the academic year in which the new image system was launched, three student focus groups were held with majors from the Art, Classics, and other humanities departments. When asked to compare the CONTENTdm native interface with the Classics Image Database and a new prototype custom interface for the Art and Architecture Collection, students strongly preferred the customized interfaces. Reasons cited included: ease of browsing, access to content for their courses and discipline, and overall superior look and feel, compared to the standard CONTENTdm interface. General response to the new image system was similarly positive: students particularly liked the zoom and pan capabilities of the system and the easy web-based access to images outside of class. Specific comments included:

• The zoom feature is really helpful for viewing details in class…it's also nice when there are multiple shots of something in the database, like the Primaporta, so you can see all different angles.

• The lecture image sets in CONTENTdm were linked from the online course syllabus. I liked how handy it was to access the images outside of class.

Some constructive suggestions were also garnered from the student focus groups, that were later incorporated into the Classics Image Database, as well as the new Art and Architecture Collection website.

Next Steps for Iterative Development
While the extension of the My Favorites feature proved to be very helpful for many users, most still found the tool to be clunky and frustrating when working with many images or galleries. CIS and the DAM workgroup decided that the best solution was to create an entirely new My Workspace from scratch. A programmer from CIS, working closely with the academic web specialist and a digital media specialist, will write a new My Workspace web application with the Ruby on Rails framework. The new application will offer: "drag and drop" organization of images; gal-

lery folders to better organize image sets; a new slide-show feature with enhanced zooming and panning capabilities; and a completely redesigned interface.

Conclusion

In today's technologically saturated academic environment, a growing number of faculty members across the curriculum in higher education are taking an interest in integrating digital media into their teaching. As analog slide equipment is being phased out, digital images have seen increasing use by art history departments. Digital images offer many key advantages over slides—particularly for simultaneous access by student outside the classroom for independent study. With the increase in use of digital media for instruction, the use of digital images is also becoming popular in disciplines other than art history, however there are specific issues that need to be addressed in order to effectively support this type growing interest. Unlike standard digitization projects, building digital teaching collections involves collection development and cataloging practices that are driven by faculty and student needs, as well as flexible web interfaces to facilitate discovery and use in an instructional context. Fulfilling these functional requirements in order to create effective teaching resources is an iterative process that takes a high degree of collaboration between staff and users.

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Notes

1. Crosswalking has been discussed extensively in the literature. The following are useful resources on crosswalking and metadata mapping in a visual/arts context, and with Dublin Core: Cromwell-Kessler 1998, Foulonneau and Riley 2008, and Wendler 2004.

2. A good overview of "application profiles" in a digital library/metadata context is available in Heery and Patel 2000.

3. The IDEAS website is accessible at http://www.ideasproject.org. However, they have since redesigned the website, and the browsing menus are no longer present.