

University of Colorado at Denver/*Boulder*
College of Architecture and Planning

Digital Asset Management Strategic Plan for the Next Three Years (*Draft*)

Delivered 04.09.04 by the College's Visual Resource Task Force

*Faculty members: Michael Holleran, Taisto Makela, Hans Morgenthaler, Ann Komara, and Joan Draper; classified staff: **Lynn Lickteig (chair)** and Jennifer Kirschke; graduate students: Mary Reynolds and Heather Thigpen; undergraduate students: Wes Burrer and Scott Brands
IT advisor: Gene Bressler*

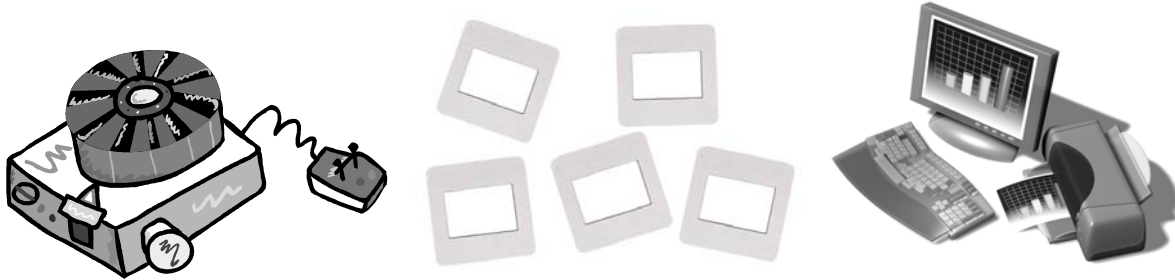


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Mission Statement

The primary mission of the Visual Resource Center is to serve and support faculty members, students, administration and staff members of the College of Architecture and Planning by providing slides, digital images, audiovisual equipment, and portfolio training and photography facilities to aid classroom teaching and educational needs, research interests, and administrative projects. The Visual Resource Center also extends its image collection services and staff expertise to extra-departmental colleagues in the CU community.

Preamble: Digital Asset Management

We seek to create a centralized digital library by purchasing digital images and scanning our analog 35mm slide collections and moving them to a web-based environment. A digital library will improve the accessibility and delivery of visual information to faculty staff and students for the purpose of education and scholarly research. We seek collaboration with related University of Colorado departments and colleges, in order to increase the amount of digital information that is accessible to our faculty and students through shared image collections, as well as through shared staffing and funding. We seek to assist faculty members with the digitization of their research and educational image collections, as well as to accommodate students' needs for digital media in their portfolios, course reviews, and classroom presentations.

Precepts of the College Digital Asset Management Strategic Plan

The College Digital Asset Management Strategic Plan is based upon principles that the Visual Resource Task Force sees as fundamental for successful implementation and use of digital information in the future:

1. **The Necessity:** The changing educational paradigm points to the conversion of analog resources into the digital environment as the expected norm in higher education. (Kodak announced it will stop production of analog slide projectors in June 2004.) To remain competitive with peer institutions, to meet and exceed the requirements of accreditation boards, to retain and recruit top-notch faculty members and students, to accommodate distance education courses, and to collaborate with other institutions to share digital information, the College must undertake immediate, well-planned and coordinated actions to enhance the College's digital visual resource environment.

2. **The Digital Demand versus Copyright Concern:** Faculty members and students increasingly expect access to digital images, information, and equipment for instruction, project presentation, and research. With the college currently unable to meet this demand for web-based digital information, a climate of individual ‘free range’ harvesting of images from the Internet has developed among faculty and students. This practice unwittingly tests the boundaries of U. S. copyright law, and pushes the doctrine of educational “fair use” to the extreme, thereby placing the college at legal risk for copyright infringements. (Please see the Appendix on pages 15-17 of this document for specific copyright guidelines and concerns.)
3. **The need for a collective Digital Library:** Should the college create and maintain a digital library for all users, or should we simply rely on faculty members to create their own personal image collections? Wider institutional needs are not served by personal collections. Adjunct and honorarium faculty often do not have their own image collections. They expect visual teaching materials to be provided by the college—just as we currently do with the analog slide collection. Students typically would not have access to a faculty member’s personal image collection for their own unique educational needs. Personal collections focus primarily on the images, whereas the related descriptive information about the image often resides only in the individual’s mind, making it difficult or impossible for other potential users to understand the material. The technical resolution of images in a personal collection is often varied, with no standards in place for file size and image resolution, creating a “mixed bag” of useful digital information. And finally, personal collections generally “leave” when the faculty member no longer teaches at the college. A quality educational institution will need to provide a legacy digital library for all users, both current and future, based on professional and sustainable standards for both the images and the descriptive text.
4. **The Digital Asset Management Concept:** Similar to a centralized book library that is a shared resource and a required and essential component of every higher education institution, in the twenty first century, a centralized digital asset management platform (a.k.a. a “DAM”) is equally important in helping our college achieve its educational mission. A DAM system’s primary functions are to describe, store, access, retrieve and deliver digital information. A DAM is the cyber portal that allows for the collection and distribution of digital information to web interfaces and, ultimately, the classroom. It contains standard metadata fields that will allow the cross-searching and linking of our digital information with the DAMS of other institutions. And a DAM system allows for institutional control over the use of copyrighted digital information, via authentication and password protection.
5. **Software platform:** The college’s current digital library, a customized Oracle database named VISC, created in 1997/98 by CU/Boulder’s ITS department, is not web accessible, and will no longer be supported. We must purchase replacement software, and migrate the digital information in VISC to a new digital asset management system. The criteria for a new DAM system should include that it: 1) be web-based; 2) interfaces with Web CT and Blackboard; 3) contain a catalogue and search database; 4) include classroom presentation and delivery software; 5) allow for searches of multiple collections, and allow display of a variety of image file formats (e.g. videos, animation, GIS files); 6) allow multiple image tiling and comparisons; 7) contain standard international metadata fields such as the VRA or Dublin core schemas to

enable future data sharing with other institutions; 8) interface with on-line authority databases like the Art and Architecture Thesaurus and Union List of Artists Names; and 9) and allow for the creation and management of personal image collections by faculty members who elect not to be part of the central digital library; 10) must be non-proprietary.

6. **IT infrastructure:** Competent digital asset use by faculty members and students depends on high quality classroom projection equipment (LCD projectors), campus-maintained SMART classrooms with Internet access, as well as “roving” setups of up-to-date computer/projector combinations on carts to allow for studio or small group presentations. The Visual Resource Centers at both sites of our college must be enhanced with the up-to-date software, computer hardware and peripherals needed to carry out the digitization project. Discussions with Denver/CINS and Boulder/ITS should take place regarding server purchase, maintenance and back-ups.
7. **IT Training:** Colleagues at academic institutions with DAM projects underway reveal that the most overlooked and underestimated component of DAM deployment is ensuring adequate IT and Visual Resource staffing to provide ongoing training, both in workshop formats and one-on-one. Faculty, staff and students will need training on the use of the new system to prepare digital lectures, to facilitate classroom presentations, and to catalogue the metadata that describes the digital images. Written instructional guidelines help, but are no substitute for face-to-face instruction. The learning curve for a sophisticated digital asset management system can be quite high at first, particularly as faculty members supplant their familiar and established analog methods of teaching with the new digital medium. The most successful and sustainable training is delivered by a campus-wide IT supported program, though “in-house” IT and VR assistance and training will always be needed. Without campus IT assistance, expect an immediate 25-30% workload increase for college staff members to address training issues.
8. **Content ‘critical mass’:** In order for any digital library project to be deemed a success, it must, of course, be used by college faculty members and students. And use of the digital library depends on its contents, or the quality and quantity of the digital information contained in it. Unless a ‘critical mass’ of digital information and images is available for use from the first day of deployment, the faculty and students will likely regard the digital library as a costly and relatively unsuccessful endeavor. Not finding what they need on their first or second use, they may not revisit it. Content ‘critical mass’ could be described as the majority of images needed to support delivering the general curriculum. ‘Critical mass’ will certainly number in the tens of thousands of images.
9. **The digital transition urgency-dilemma:** Traditional analog 35mm slide collections took many decades to build. Our college’s two slide collections, which collectively total 68,000 slides, were built up over the last 25 to 35 years. We have catalogued 45,000 records into a database, and scanned 13,000 images over the last six years. We own the copyright to 28,000 slides, due in part to a large donation in 1999 by a retired historian named Peter Dulan, as well as faculty and student donations. (But this database is not web-accessible.) The general expectation, or perceived urgency, for the transfer from analog to digital is often regarded as needing to occur within the next three to five years. Shrinking decades of work into 3 years is a daunting task. Because

our current database is not web-accessible, the factor of transitional urgency has contributed to faculty and students believing the easiest thing to do is create their own digital collections, often with illegally harvested images from the Internet. Yet personal collections are just that. They are not a collective resource available for use by all faculty and students. Personal collections will leave the college over time. We seek to build a web-accessible legacy digital library for all students and faculty to use both now and in the future. (See “Solutions” under item #11)

10. **Digital libraries are more than just images:** The initial groundwork of any digital transition project has two distinct components: scanning images and cataloguing metadata. ***Digital Information = Educational Text (Metadata) + Digital Images.*** Many people think scanning the images is the most difficult part, and they narrowly focus on “how quickly can we digitize the images?” In reality, it’s the cataloguing component, the descriptive text, that’s far more time-consuming for staff members. The educational text, or metadata, should be considered as “mission critical” for end users. Without the metadata, the digital image is only marginally useful. If a student doesn’t know what the image is, effective education can’t take place! In order to understand content, and in order to search, access, retrieve and deliver digital images to faculty members and students, images must be catalogued into a digital asset management system. And cataloguing metadata is time consuming! At our present, our Visual Resource classified staff is 1.8 FTE—not even two full-time people. Since these VR staff members have many job duties beyond digital asset management spanning two CU campuses, digitizing our large analog slide collections could take decades—just as it did to build the original analog slide collections. (See “Solutions” under item #11)
11. **Solutions to the ‘critical mass,’ urgency, and copyright dilemmas:** While initially it may seem overwhelming to solve the challenges of ‘critical mass’ (enough images) and urgency (in a short time frame) and copyright (the legal use of images), there are several options to consider:
 - One solution to fast-track digital conversion efforts would be to increase classified staffing, yet most college budgets simply can’t afford adding one or more full-time permanent classified staff. However, increasing current part-time staff to full-time is an affordable option, without significantly increasing the budget or benefit costs. Increasing student employees at both sites of the college is critical to the project as well. Additionally, adding short-term, temporary staffing during the first two years’ start-up phase would facilitate training others on the use of the system, as well as provide concentrated help towards the initial hurdle of cataloguing and scanning of images. “Job sharing” with other departments to co-share the costs of temporary or permanent staffing, in order to ultimately combine image collections at a digital level, should be explored.
 - One solution for the ‘critical mass’ and urgency issues would be to consider a one-time, large bulk purchase of digital images and metadata from a commercial vendor of digital images. Another solution would be to use subscription services that “rent” digital images to users on a year-to-year basis. Commercially purchased or rented digital images have the added advantage of being very high quality images (and high resolution digital scans), taken at the original sites by professional photographers. It should be pointed out, however, that only one subscription service for digital images currently exists (AMICO), and another is

expected to be deployed in late 2004 (ARTstor). Neither will completely satisfy the needs of our faculty and students because they tend to focus on artworks in museums, or older works that are copyright-free and in the public domain (pre-1923). Commercial vendors have far more up-to-date images of subject matter that would pertain to our college curriculum. But even commercial vendors don't have every single image our faculty would ever want to use in teaching. There will always be a need to supplement purchased or rented digital images with selected images scanned from our current analog collections, which were, after all, created in response to the unique teaching needs of our faculty members.

- Though initially the bulk purchase price for digital images might seem high, when compared to the costs of adding additional permanent staffing, bulk digital image purchases are quite reasonable. They're also immediately ready for use, and again, it's only a one-time, up front cost. Subscription services, though less costly than bulk purchases, are still expensive, and the disadvantage is that this cost is on-going every year. However, just as with the idea of "job sharing," the costs for commercial digital images could also be spread out among departments and other campus institutions. Perhaps the CU campus libraries could be persuaded to pay for the yearly subscription services—much like they currently do for hard copy and electronic journal subscriptions. Whereas several CU departments could partner and co-share the costs for the bulk purchases of digital images and scanning in-house images, by using general funds, grants, or other fiscal sources. But remember, to partner with others, we would need our own digital asset management system to even be considered a player.
- And last, but certainly not least, subscription services and commercially purchased images address the copyright issue of which every CU administrator is rightfully concerned. The commercial vendors own the copyright, and with purchase, the vendor grants to the users the legal use of the images, in perpetuity. With subscription, use of the image is legal as long as the subscription is paid. And since the U.S. Digital Millennium Copyright Act of 1998 states that if a digital copy of an image can be purchased at a fair price, you must purchase it--rather than illegally download or scan it--the university would be following the letter of the copyright law. A bulk purchase, along with the rental of digital images, would solve the immediate urgency, 'critical mass', and copyright issues, and allow staff the "breathing room" to tackle in-house scanning of selected images from the analog collection.

12. What is the need for Visual Resource Staffing? Is the office door opened or closed? It might seem that purchasing and renting digital images would eliminate or reduce the need for classified VR staffing, and that the ability to access digital information "24/7" via the World Wide Web means we would no longer have to maintain an "open door" Visual Resource Center. A digital asset management system will assist Visual Resource staff members in doing their jobs, but it clearly won't replace them, for all of the following reasons:

- VR staff will be needed, at the administrative level, to document student and faculty projects for accreditation purposes. ***Academic accreditation boards both require and rate the level of visual resource staffing and services available, and even the physical space allotted to visual resources.***

- A digital library is based on a computerized system. We should expect that 'glitches' will occur in the database, the equipment, and in the classroom delivery of the digital information. VR staff will be needed for daily system management.
- Faculty and students will need the VR staff to provide on-site training and technical assistance to effectively use the digital library for classroom presentations and scholarly research.
- VR staff will be needed to assist faculty and students in digitizing images from their personal teaching collections, images created for publications and course presentations, and documentation of class projects for inclusion in personal portfolios.
- New images will be added to the system each year as the world builds new projects and creates new art. New images will also be required to respond to changes in the curriculum, as well as to accommodate the diverse intellectual expectations of faculty members and students. VR staff will process these new acquisitions.
- While it is true that purchased images come with some descriptive metadata, VR staff will generally need to augment and edit purchased data to provide a more comprehensive educational experience.
- Commercial vendors and subscriptions services don't have every image we'll ever need to educate students. VR staff will still need to scan portions of their in-house analog collections that reflect unique and hard-to-find material to supplement purchased material. We might be able to purchase photographs of the exteriors and interiors of buildings, but perhaps not the floor or site plans, the axonometric and sectional drawings, or the models. The examples are innumerable for every discipline.
- VR staff will need to monitor the copyright policy and compliance to it.
- Visual Resource staff members have many more duties beyond digital asset management, including administering a yearly budget, and purchasing, maintaining and checking out cameras and audiovisual equipment. They provide group and individual portfolio instruction and seminars for students and faculty. They engage in public relations photography for the college web site, recruiting brochures, and newsletters. They manage photographic studios and laboratories, including hazardous waste compliance.

Digital Asset Management: a step-by-step approach

The six basic components of a quality digital asset management system are:

1. **Digital Information Creation and Acquisition**
2. **Digital Information Access, Retrieval, and Delivery**
3. **Digital Information Storage**
4. **Digital Information Copyright Control**
5. **Digital Asset Management Support Staff**
6. **Digital Asset Management Budget**

A brief summary of each component, and the primary requirements for each stage, are as follows:

1. **Creation and Acquisition:** The internal conversion of the college's analog image collections to the digital environment will allow greater numbers of simultaneous users to collectively access digital information for education and research, including clients who may not have had access to the analog collections. The acquisition of digital images from sources external to the college will fast-track the conversion efforts, ensuring that a 'critical mass' of digital information is available in a relatively short time frame (a few years versus a few decades).
 - A. **Creation and Acquisition Software Needs** include: 1) the digital asset management platform (a.k.a. "the DAM"); 2) image processing software, for scanning and processing images "in-house" (i.e. Adobe PhotoShop); 3) word processing and image presentation software (i.e. MS Word and PowerPoint) and 4) virus protection software (i.e. Norton Utilities, etc.)
 - B. **Creation and Acquisition Hardware and Internet Needs** include: 1) "workstation" computers for staff cataloguing, image scanning, and text data entry; 2) peripheral devices for digital information input and output (i.e. flatbed and film scanners, printers, surge protectors or Power back-UPS); 3) Internet Access via land lines (hubs or jacks as opposed to the wireless network) for cataloguing, access to on-line authority resources, web delivery of images and digital data.
 - C. **Creation and Acquisition 'Critical Mass' Image Options** include: 1) outsourcing the scanning of the college's analog collection to private companies; 2) internally scanning the college's analog collections ourselves; 3) purchasing digital images from commercial vendors; 4) yearly subscriptions to "image banks" like AMICO or ARTstor, but note that the latter is still in a start-up phase.
2. **Access, Retrieval, and Delivery:** A digital asset management system will allow college members to use image organizational tools and descriptive information that is organized in an 'easy-to-search and arrange' method for classroom presentations and scholarly research. Collaboration with campus-wide IT providers should ensure quality classroom digital projection equipment and technical assistance in SMART classrooms with access to the Internet. Authentication of users, coupled with password protection to the database, should ensure copyright compliance.
 - A. **Access, Retrieval and Delivery Software Needs** include: 1) a 'read only' version of the DAM system for client searches, plus a web interface for

- classroom presentations, course review sites, etc.; 2) password-protected access to the system for copyright protection purposes.
- B. **Access, Retrieval and Delivery Hardware and IT Needs** include: 1) quality classroom projection equipment; 2) campus-maintained SMART classrooms; 3) “client workstations” for database searches and presentation needs; 4) computer/projector combinations on “roving” carts for presentations in studios and in smaller non-SMART classrooms; 5) authentication of users to ensure they are members of our university system.
3. **Storage:** A digital asset management system is ‘image intensive’ and, by nature, will require large amounts of digital storage, both on-line and off-line. Ideally, the main server(s) for the DAM project would be maintained and backed-up by campus-wide IT providers. Utilizing two to three different storage mediums for off-line storage (i.e. CD’s, DVD’s, DAT tapes) for the high resolution, large ‘master image files’ is strongly endorsed by the professional community. In keeping with rapidly changing technology, the digital image files have the best chance of migration to, and being read by, the DAM systems and computers of the future if stored in multiple file formats.
- A. **Storage Software Needs** include: 1) the server operating software, to be determined by IT campus or college standards, as well as the DAM system requirements (i.e. *Oracle 8i+*, *Microsoft SQL Server 7+*, *DB2 JRE 1.4.1*, *MS IIS 4.0+*, or *Apache 1.3+ Resin 2.x* or *Apache Tomcat 4.x*) and 2) virus protection.
- B. **Storage Hardware Needs** include: 1) the server(s), to be determined by IT campus or college standards, as well as the DAM system requirements (i.e. *NT 4.0 or higher (service pack 5)*, *Sun Solaris 8+*, *UNIX (with java support)* or *Linux (with java support)*)
- C. **Storage Offline Storage Media Needs** include: 1) CD’s; 2) DVD’s; 3) DAT tapes for back-ups of the large 18-20 MB master image files. Our college’s in-house analog image collections have been estimated to have a minimum need of 1500 gigabytes of off-line storage space by the time the initial digitization efforts are complete.
4. **Copyright Control:** The educational necessity and advantages of a shared digital library, and the envisioned collaboration of digital image collections among university groups, bring with them the very real concern of copyright violations. No university wishes to be the equivalent “Napster” legal test case for the pirating of copyrighted images and text from hardcopy publications or obtained via the Internet. IP authentication and database password protection offer some measure of copyright protection. But the only true copyright protection will come from having copyright policies and guidelines in place, and educating faculty, staff, and students as to those policies. The lure of easily xeroxing publications or downloading digital information electronically allows some users to forget that simply because they “can” do it, doesn’t mean they “may” do it. (Please see the Appendix at the end of this document for specific copyright guidelines and concerns.)
- A. **Copyright Software and Policy needs** include: 1) IP authentication in collaboration with campus-wide IT providers; 2) password-protected access to the DAM system and web-based image review sites so that only select groups of users have access to the digital information; 3) an “I agree” copyright interface at the individual user level, as a condition of entering the digital asset management system or course review web sites; 4) advice from university legal counsel to

shape and approve copyright policies; 5) information regarding copyright policies posted on the CU campus web sites, as well as on college or departmental web sites, with links to appropriate resources.

5. **Digital Asset Management Support Staff:** A successful digital asset management project will involve a large team of people, from macro to micro, from the campus administrators making system and budget decisions, to legal counsel formulating copyright policies, to the individual college staff members who input the text and images into the database. Collaboration among colleges and departments is a must in a climate of limited staffing and shrinking resources, and also to enhance and enlarge the 'critical mass' of digital collections. Faculty mentoring is also essential. A description of the various Visual Resource (VR) staff members required of any digital asset management system follows. **(Note: while many of the various staff duties are often performed by the same person, one person cannot ultimately fulfill every role.)**
 - A. **VR Professional Cataloguing Staff:** for scholarly research, verifying accurate educational information, data input, and enforcing institutional copyright policies. These staff members must assure adherence to international "metadata" standards in the text database, to make possible digital information sharing among departments and universities in the future.
 - B. **VR Scanning Staff:** for digitizing, or in-house scanning, of analog images. Digitizing duties would include both the college's permanent teaching collections as well as assistance for faculty members and students who seek to digitize their own personal image collections.
 - C. **VR Front-line Staff:** for "walk-in" customer assistance for everything from database searches, to general training on use of the system, to "intake" of new image requests, to digital equipment checkouts, to technical classroom assistance, to digital photography assistance. Also needed for checking out and accessing the analog images while we transition to the digital age.
 - D. **VR Operations Manager:** for hiring, supervising and training the cataloguing, scanning and front-line VR staff members. The manager ensures that all staff are following technical and metadata standards, performing well, and are adequately informed about system issues. The operations manager also functions as the liaison who interfaces with the IT staff, faculty members, administrators and other CU departments.
 - E. **IT Support Staff:** for both inter-departmental and extra-departmental needs, including technical support for the software and hardware as they relate to 1) the digital asset management system; 2) the system workstations and servers; 3) web access and interface(s); 3) the classroom delivery and projection of the system's digital information; 4) user-training on the Digital Asset Management system (entering and searching for data, creating lectures, and delivery and projection of lectures in the classroom).
 - F. **Faculty "Mentors":** for data verification and image acquisition input and to function in the capacity of advisors to the digital library project. Faculty members' use of the system for instruction, and their input for the digital future, will ensure the success of the system.
6. **Digital Asset Management Budget:** Digital asset management systems are costly, at least initially. As with any new implementation, larger start-up costs will account for

initial, one-time investments that are needed to get any new computer initiative off the ground. Software and hardware technology are ever-changing, and we should expect that the digital asset management system we build today, will likely be migrated to an upgraded system in the future. As we enter this next phase of educational technology, to be poised to link systems with other institutions, we must posthaste adopt digital standards at every level: technical—metadata—and copyright.

VR and IT staffing will always be needed to build, manage, and sustain these new digital standards. Staff members will serve the faculty and students in their use of the new digital media on a daily basis. Be wary of budget misconceptions such as, “once we’ve scanned everything, we won’t have to invest any more money.” Staffing and technology are essential to the project and have never been cheap.

There will be an ongoing need for yearly funding of the Visual Resource Center’s digital asset management system. It will be an integral part of the Visual Resource Center’s operating budget. As a service unit for faculty and students, and as an educational tool, it would be appropriate for student fees to augment this digital project. The precedent is that the Visual Resource Center was essentially founded on student fees in 1985 at the Boulder site, and to date, undergraduate student fees (\$65K) account for 55% of the Visual Resource Center’s operating budget. Undergraduate student surveys in Boulder taken in March 2003 revealed 81% were highly satisfied with the staffing and services of the Boulder VRC. Denver students spent \$12K on Visual Resource related needs in 2003 and an April 2004 survey indicated that 88% rated a web-accessible digital library as very important to the college.

- A. **Budget Software expenses:** A digital asset management software platform that includes all the desired features to provide a professional product for faculty and students may cost between \$45-\$75,000 dollars initially, and around \$10,000 to \$13,000 per year for maintenance fees. Costs to migrate images and data from the old database to the new database will also occur in the start-up phase. We seek to collaborate with other CU departments and colleges that also plan to digitize their image collections, and this collaboration would include sharing the project costs, like software. The net gain of combining resources, beyond budget, is having access to a larger and richer pool of digital information.

Our Visual Resource Task Force did review less expensive DAMS, and came to the conclusion that those systems typically are limited in their functionality. Many will not display a variety of image files (like audio, video, animation, and GIS files), or zoom in on an image, and some are incapable of showing multiple images views (or ‘tiled’ images) on one screen, as an instructor would do when making comparisons. Others are not web-based. We need to begin with a software platform that will handle all our needs, and that will be adaptable for use by faculty and students representing a variety of disciplines.

- B. **Budget Hardware expenses:** Computers, and the needed peripheral devices like scanners and printers, vary from \$1800 to \$4800 per “unit”, depending on whether the computer is to be used as a server, a staff work station, a student or faculty scanning station, or simply a “search” station in the digital library for students and faculty to browse the collection. The

operating budget will need to factor in equipment upgrades, at minimum, every 3 to 5 years. The number of staff computer workstations will ultimately affect the speed at which we can accomplish the digital conversion, and how quickly we can grant classroom access to the digital information.

- C. **Budget Storage expenses:** 1) Supplies like blank CD's, DVD's or DAT tapes will cost \$500-\$1500 per year. To assure that no effort or data is lost, we will make several "back up" discs of our "master" image files. Kodak recommends backing up the "back up" discs every 18 months. Archiving digital images will be a constant process and a yearly operating expense. 2) A server can cost \$5000 to over four times that much, depending on the recommendation of our campus IT providers. The server being used for our VISC digital database at the Boulder site, can likely be used for the start-up. But as with any computer, the budget will need to factor in the server's replacement and upgrade every 3 to 5 years.
- D. **Budget Staffing expenses:** Personnel are always the most expensive budget component of any digital asset management project. However, the college already has 1.8 FTE in current classified staff members working in Visual Resources as part of the regular budget. These staff will naturally assume major roles in the new digital initiative, but will obviously need help to carry out the project on two campuses, as well as manage the many other services provided by the Visual Resource Centers. Instead of hiring additional, permanent staff members, cost-saving options could include:
- 1) increasing current part-time staff to full-time; an affordable option, without significantly increasing the general budget;
 - 2) hiring more student employees at both sites of the college. This would contribute significantly to carrying out the project and put students to work using student fees;
 - 3) adding short-term, temporary staffing during the first two years' start-up phase. This would facilitate training faculty and students on the use of the digital system, as well as provide concentrated help towards the initial hurdle of cataloguing and scanning of images;
 - 4) "Job sharing" should be explored with other departments to co-share the costs of temporary or permanent staffing, in order to ultimately combine image collections at a digital level;
 - 5) Grant funding could be sought for portions of the digital asset management project, but yearly operating budget support is needed for the new digital system to succeed and be sustainable.

College Digital Asset Management Strategic Plan: May 2004 - May 2007

Spring/Summer 2004 (by August 31, 2004)

Action	Component
Select and Purchase the Digital Asset Management Software Platform Migration costs of data and images from current database (VISIC) to the new platform	Creation & Acquisition Budget Software
Insert annual Digital Asset Maintenance Fees into the Visual Resource Center's yearly operating budget	Creation & Acquisition Budget Software
Research Computers and Peripheral Devices (Scanners, Printers) for staff workstations and student and faculty scanning stations	Creation & Acquisition Budget Hardware
Install additional hubs or jacks as needed in the VRC's at both sites of the college. Install digital projectors in Denver classrooms 320A/320 + Boulder Classrooms 122, 134 and 102	Creation & Acquisition Budget IT infrastructure
Increase one Boulder part-time classified staff member (Arts Professional IV) from current 32 hours per week to 36 or 40 hours per week	Budget Classified Staff
Explore transitioning one Boulder full-time staff member to work 2 to 3 days per week at the Denver site on a regular basis—no additional funding needed, but rather a funding transfer of which college account pays wages	Budget Classified Staff
Explore if additional space can be allocated for Digital Asset Management Computing Labs, including scanning stations for faculty and student use. Potential Conversion of analog Photo Labs in Denver and Boulder into Digital Asset Processing Computer Labs	Creation & Acquisition Budget: Physical Space Renovations
Explore collaboration with the CU/Boulder College of Art and Art History—a rich resource of over 350,000 images as well as professional staff. They would consider partnering resources and staffing and would use the same database—we would be one digital library	Creation & Acquisition Budget Collaboration Library Collaboration
Explore additional collaborations on the Boulder campus: Norlin Library, ITS, ATLAS for database sharing, IT support and the DAMS training needs, and for funding	Creation & Acquisition Budget Collaboration IT Support
Explore collaborations on the Denver campus: Auraria Library, CINS; The College of Arts and Media for funding, IT support and the system training needs, and database sharing	Creation & Acquisition Budget Collaboration IT Support
Meet with legal counsel to review/create a college policy on Copyright, and post it electronically on the college web site, as well as post hard copies in VRC's	Copyright
Explore options to achieve content "critical mass"; research purchasing digital images from commercial vendors and subscription services to image banks; Query Faculty members on desired new content for teaching.	Creation and Acquisition

Fall 2004

Action	Component
Deploy Digital Asset Management Software for use at both sites of our college Digital Asset Management computer labs are created and installed at both sites of our college, including faculty and student scanning stations	Creation & Acquisition Access, Retrieval and Delivery
Intensive training for Visual Resource classified staff and student employees on the Digital Asset Management system software platform (train the trainers.)	Budget (training) IT Training
Train faculty and students on use of the digital asset management software for classroom presentations, soliciting an initial core group of faculty members interested in digital classroom instruction, and targeting their image needs as a starting point for digital collection-building	Access, Retrieval and Delivery Creation & Acquisition
Ensure IP authentication and password protected access to the digital asset management system are in place	Access, Retrieval and Delivery; IT software IT infrastructure

Purchase Computers and Peripheral Devices (Scanners, Printers) for staff workstations and student and faculty scanning stations	Creation & Acquisition Budget Hardware
Purchase computer desks and chairs and partitions (as needed) for staff work stations and student and faculty scanning stations	Budget Furniture IT Hardware
Increase graduate student employees on the Denver campus to maintain 8 to 5, Monday through Friday hours in the Denver Visual Resource Center during the mid-August through mid-May academic year. Explore options for part-time Denver student help from mid-May to mid-August. Biggest complaint is Denver VRC is not open standard hours.	Budget Student Hourly Denver
If the Arts Professional III classified staff member works less at the Boulder site, increase undergraduate student employees to offset her absence.	Budget Student Hourly Boulder
Purchase and incorporate into the DAM the digital images purchased from vendors as researched in Summer of 2004.	Creation & Acquisition Budget Digital Images
Begin training of new faculty members on how to use digital asset management software to create lectures, demonstrate how to project lectures in the classroom, and how images may be incorporated into WebCT and Blackboard.	Access, Retrieval and Delivery IT training
Meet with Curriculum Committee and survey students on both campuses about converting darkrooms into digital asset computer labs, as these labs are student fee funded.	Space Renovation
Work with faculty mentors regarding digital images that are critical to the collection, but either cannot be purchased, or cannot be purchased at a fair price, so that copyright permissions can be obtained from owners.	Copyright
Upgrade digital projection systems in classrooms (as needed) and update equipment for mobile classroom projection units on carts (projector/computer combinations)	IT Hardware Classroom Delivery
Meet with CU legal counsel or other professional in the copyright field to discuss policies regarding intellectual property right donations from faculty members, including valuation	Copyright

Spring, Summer, and Fall 2005

Action	Component
Assist faculty in researching copyright for digital images they are already using from the internet or have scanned from books.	Copyright
Work with faculty mentors to write grants for further funding of the Digital Asset Management Project.	Budget
Hire and train temporary positions to assist in cataloguing and scanning for the first two years of the project.	Creation & Acquisition Hourly Temp. Budget
Convert darkrooms into computer labs depending on the results from the student surveys and decisions made in the Curriculum Committee.	Space Renovation IT Hardware
Concentrated effort among staff in the VRC to scan and catalogue tenured track faculty personal collections beyond initial target group.	Creation & Acquisition
Work with established CU collaborators to train their employees on cataloguing and scanning, so there is a standard among potentially shared collections.	Creation & Acquisition Collaboration
Work with students and faculty engaged in Study Abroad programs to obtain original, digital, copyright-owned images from our various programs.	Creation & Acquisition
Continued effort to obtain copyright permission to include digital images not available for purchase, or for purchase at a fair price, into our digital library.	Creation & Acquisition Copyright
Collaborate with faculty for independent study opportunities to continue documenting Colorado Architecture for our website called the Electronic Library of Colorado Architecture Landscape, and Planning (ELCALP).	Creation & Acquisition
Ongoing training of new faculty members on how to use digital asset management software classroom presentations, and incorporation into WebCT and Blackboard.	Access, Retrieval & Delivery IT Training
Explore interest in image donations from local professional architects, landscape architects and urban planners for inclusion in the digital library	Creation & Acquisition

Spring, Summer, and Fall 2006

Action	Component
Continued effort to scan tenure track faculty member's personal slides.	Creation & Acquisition
Start a more concentrated effort to scan adjunct faculty members' personal slides.	Creation & Acquisition
Explore selling copies of our copyright owned digital images—the Dulan Collection and other copyright-free donations.	Budget Generating
Offer CD of ELCALP images for sale to the public.	Budget Generating
Continued effort to obtain copyright permission to include digital images not available for purchase, or for purchase at a fair price, into our digital library.	Copyright
Continue cataloguing and scanning selected images from our analog 35mm slide collections for inclusion in the digital library.	Creation & Acquisition

Spring 2007

Action	Component
Have the entire "Dulan" Donation Collection (23,000 images) catalogued and scanned.	Creation & Acquisition
Phase out temporary employees.	Budget Reducing
Work on major off-line media backups of all digital imaging to date. (This should be done every two years) Refresh CD's or DVD's	Storage
Ongoing training of new faculty members on how to use digital asset management software for use in classroom and incorporation into WebCT and Blackboard.	Retrieval and Delivery IT Training
Have program in place to orient incoming students each semester on how to use digital asset management software to use as study tools, to interface with WebCT and Blackboard, and for personal presentations and research.	Access, Retrieval and Delivery IT training
Continue cataloguing and scanning selected images from our analog 35mm slide collection for inclusion into digital library.	Creation & Acquisition
Continued effort to obtain copyright permission to include digital images not available for purchase for a fair price in the digital library.	Copyright
Have in place a standard policy for scanning and cataloguing of faculty slides or images on a continued basis, including number of slides scanned per semester, copyright, and turn around time.	Creation & Acquisition Copyright Policies
Upgrade digital projection systems in classrooms (as needed) and update equipment for mobile classroom projection units on carts (projector/computer combinations)	IT Hardware Classroom Delivery

Appendix: Copyright Policies for Educators (including analog and digital resources)

Higher education faculty members and students require images and educational materials for classroom instruction, project presentations, and research. Where they obtain or copy this educational data from is generally not a major legal concern--as long as the educational experience is confined to a small, more-or-less, private audience, and the amount of copying is not substantial.

After the 1991 *Basic Books v. Kinkos* copyright lawsuit, where the copy shop was successfully sued by several publishers for making photocopies of copyrighted articles and portions of books to compile and sell them in “course-packs,” educational institutions and faculty members were made keenly aware of the legal and monetary dangers of copyright infringement. Most scholars have a healthy respect for copyright as it pertains to printed works.

As educational institutions embrace the use of the World Wide Web for course content and course review study sites, the issue of copyright law once again needs to receive serious attention. A climate of “we can get everything we need off the Internet,” and rampant downloading of digital data, has taken hold among faculty members and students at an astonishing rate. Most sincerely believe that, since their copying is for non-profit, educational use, it is therefore legal—a so-called “fair use”. Maybe, but maybe not.

An examination of the 1976 U.S. Copyright Act, sections 106 and 106A, describes the four factors used to determine if the use of a copyrighted material can be considered “Fair Use.” The Copyright Act defines these four factors as:

1. the purpose and character of the use, including whether such use is of commercial nature or is for nonprofit educational purposes;
2. the nature of the copyrighted work;
3. the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
4. the effect of the use upon the potential market for or value of the copyrighted work.

Certainly, factor one is on the side of education. Factors three and four are the hardest to work around. Regarding factor three, in general, the less you take, the more likely the copying will be excused as a fair use. However, even if you take a small portion of a work, if that portion is viewed as the “heart” of the work, then your use will not be considered a fair use. Factor four considers whether use of the work deprives the copyright owner of income, or undermines a new or potential market for the copyrighted work. If it does, it may potentially trigger a lawsuit.

In 1998, the United States Congress drafted the Digital Millennium Copyright Act (DMCA) to address copyright issues in the digital age. Fair use is still permitted, but with guidelines for the allowable percentages of works to be copied, the quality or resolution of the works being copied, and with limits set for how long the continued use of copyrighted works is permitted. Regarding digital images, the DMCA states that if a digital image is available for purchase at a reasonable price, it must be purchased. This ruling is based on factor four of the fair use guidelines: the effect on the market. If a commercial vendor has a digital image for sale, but you choose to download it for free, that undercuts the vendor’s income. Users are required to make a ‘good faith’ effort to determine whether a desired digital image is available for sale. That’s the law. And also a good reason to consider the bulk purchase of digital images to populate the college’s digital library.

The Digital Millennium Copyright Act also addresses factor three of fair use: the amount or substantiality of the portion copied. The 1999-2002 Recording Association of America v. Napster lawsuit, regarding a web site company that allowed users to download copyrighted music from the Internet for free, is an example of millions of average people who failed the fair use test. Ignorance of the copyright law was not considered a legal defense. Along with thousands of institutions nationwide, after the Napster case, the University of Colorado was forced to take measures to educate faculty and students about copyright law in regards to downloading music, because the university could be held legally liable, even if the infraction occurred within the context of education.

The Napster equivalent case regarding digital images is lurking just around the corner, about to blossom from the unbridled downloading of thousands of images by educators and students who give no serious thought to the copyright laws. Or if they do consider copyright, they profess that fair use will shield them. The ease of downloading digital information in the comfort of their home or office blinds them to the reality that once their image collections number in the thousands, they're likely guilty of copyright violations. And if even one of these images is available for purchase for a reasonable price, they have assuredly broken the law. Many web site authors and image copyright owners are now using encryption codes that function as cyber bounty hunters to track illegal use of their images. These so-called "sniffers" allow copyright owners to know when an image has been illegally downloaded and who downloaded it. Lawsuits are just a matter of time. Does the College of Architecture and Planning want to risk being the "test case" for the illegal downloading of images from the Internet?

We must immediately craft a copyright policy for our college, with input and mentoring from the CU system's legal counsel. Copyright policy should be posted on our college's web site, along with links to web sites that contain copyright "tests" a user may take to help them determine if their use of a work could be considered fair use. We must take the copyright issue seriously, and quickly bring faculty and students up to speed about copyright laws in the digital environment.

A short summary of copyright guidelines:

1. If a digital copy of an image can be purchased at a fair price, you must purchase it.
2. Seek permission to use digital images before downloading them from a web site.
3. Assume all images on the Internet are copyrighted, unless it clearly states you may use the images freely. Web sites are not under obligation to provide a copyright notice.
4. Even web sites that state images may be downloaded should be treated carefully, as the web site owner may have posted images illegally without knowing it themselves.
5. Ignorance of copyright law cannot be used as a legal defense.
6. Works created prior to 1923 are in the public domain and are copyright free. Works created from 1924-1978 are protected for 75-95 years. Works created after 1978 are copyrighted for the life of the author plus 70 years.
7. Some copyright exceptions are made for non-profit, educational use. Most involve assurance of a password-protected access system whereby only select groups of users (like students in a class) have access to the copyrighted images, and the passwords are changed frequently.
8. A digital library should contain a copyright notice page that contains an "I agree" button that the user has to actively "click" as a condition to enter the site.

Simply stating the copyright policy on the screen isn't enough; the user must be made to actively acknowledge the policy by clicking the "I agree" button on the screen.

Ask a Copyright Lawyer—current advice (2004):

College of Architecture and Planning staff member, Lynn Lickteig, attended the March 2004 national Visual Resources Conference, and attended 6 hours of copyright sessions. A unique opportunity occurred to "ask a copyright lawyer" any question regarding copyright law. Ms. Lickteig posed the hypothetical scenario and question:

"Suppose a faculty member downloaded thousands of images from the Internet, of varying technical resolutions from low to high, stored them on their hard drive, backed them up on a DVD, all for the purpose of non-profit educational instruction. Permission to use the images was not sought, nor did the faculty member make an effort to determine whether a copy of the images was available for purchase. The faculty member believes his actions to be fair use. Would the faculty member be protected by fair use under copyright law?"

Lynn's question was answered by Micah Stolowitz, a copyright lawyer with the firm of STOEL RIVES LLP, and Laura Levinson, associate general counsel with the National Gallery of Art.

The first general observation made by the lawyers was that "fair use doesn't guarantee the user the most convenient way to get the material they need." If a digital copy of an image can be purchased, it must be purchased--the Digital Millennium Copyright Act is very clear on this. Whether an adequate college budget exists for the purchase of digital purchases is also irrelevant. "Having no money to buy the image, or simply downloading to avoid buying the images, doesn't factor into fair use." The fact that no attempt was made to see whether the image could be purchased "would also violate fair use."

The second observation was that in a legal court case, a judge would look at the quantity and extensiveness of the copying. "A few dozen, or even a few hundred, might be excused as fair use, depending on the nature of the work, but once you cross the line into thousands of images, a judge would determine that the sheer volume of the copying violates factor three of fair use—the amount used."

The lawyers stated that copyright law requires institutions to have a copyright policy and to enforce it. The third observation was that if the faculty member has been apprised of the copyright law by the university, and "within the scope of the employment, willfully violates institutional policy, they are not acting within the scope of the university, and would be guilty of 'willful infringement' of copyright policy, which is a criminal liability."

The fourth observation was that the university, as the faculty member's employer, would perhaps have a legal "joint liability" if the faculty member is using a university-provided office and computer, and administrators are aware of the downloading activity.

The fifth observation was that Digital Millennium Copyright Act states that only "low resolution, thumbnail size images can be downloaded legally--defined as no larger than 125 x 125 pixels." The fact that some of the downloaded images were high resolution would also negate fair use being used as a copyright defense.

The sixth and final observation was that Internet users should be wary of web sites that state it is "okay" to harvest their images. How do you really know for sure that the web site owners actually legally own the images they are giving away for free? They could have unwittingly harvested them illegally in the first place. "More diligence in investigating the truth of their warrant" regarding ownership of the images is needed, particularly if large quantities of images are to be harvested from the site.