

## DELIVERING INSTRUCTIONAL MEDIA: A LIBRARY-IT PARTNERSHIP

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At the University of Tennessee, a unique collaboration between the University Libraries and Office for Research and Information Technology (ORIT) has fostered a new centralized and centrally funded service called the Digital Media Service (DMS). The primary role of DMS is digital conversion, storage, and delivery of instructional media. DMS also assists faculty in securing copyright permissions and offers referrals to related media production and technology outlets on campus. As a collaborative model, this “one-stop shop” facilitates incorporation of technology in instruction. This paper will explore the advantages of a partnership model in delivering network-based instructional media, review the prerequisites to such a service, and examine the potential impact on the university community.

### Factors Leading to Collaboration

Collaborative pilot projects for electronic course reserves<sup>1</sup> led directly to the proposal for funding a university-wide service for digitization. From June 1999 through May 2001, staff from the University Libraries and Office for Research and Information Technology worked together to develop and evaluate the first generation of online reserves on campus. They formed two groups centered on 1) text, image, or graphical materials and 2) audiovisual materials which would require streaming to users. Librarians, technologists, and faculty gained experience together in discovering appropriate procedures, exploring copyright issues, learning the support mechanisms students would need, and setting operational policies.

Why did this initial collaboration occur? The Office for Research and Information Technology already had equipment (encoding equipment, a video server, appropriate software licenses) and staff trained in the conversion, storage, and delivery of the electronic files. Its Emerging Technologies group had been developing applications to implement video-on-demand and live web casting since 1975. They sought further opportunities to test various software packages, options for serving streamed media, and the robustness of the network and server when student demand was high. The Libraries brought experience furnishing reserve services to students, organizing information for access, and knowledge of copyright law and the doctrine of fair use. Faculty and staff of the Libraries wanted to deliver online reserves as quickly as possible, to make the materials accessible through the online catalog, to comply with copyright law, and to develop best practices for ensuring student satisfaction. By combining expertise and sharing costs, the collaborative groups were able to initiate the projects quickly and to bring multiple perspectives to problems and issues as they arose.

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<sup>1</sup> Pauline S. Bayne and Chris Hodge. “Digital Audio Reserves: A Collaborative Project at the University of Tennessee.” *Journal of Interlibrary Loan, Document Delivery & Information Supply* 11, no. 4 (December 2001): 25-36.

In the course of these pilot projects, librarians and IT staff recognized a number of environmental factors influencing their proposal for a central digitization and delivery service for the university. First, the growing emphasis on learning technologies in classroom instruction and in distance education presented certain challenges. While the University supported an excellent IT unit—the Innovative Technologies Center—to train faculty to use technology in teaching, not all faculty want, nor should they need, to learn the techniques required for converting their instructional materials. Next, uneven resources across campus predicted an uneven ability for production in different UT colleges. Finally, increases in the availability and use of digital images for teaching and scholarship underscored the need for support in bringing image-based resources to the classroom.

### The DMS Partnership

Key members of the electronic reserve pilot projects authored a report in May 2000 summarizing results of the pilot projects and advocating formation of the Digital Media Service. They delivered an initial report to the Dean of Libraries and Vice President for Research and Information Technology in August and a final report in November. By that time, these administrators had recognized the great advantages of scale in a digital production facility and decided to locate the facility, as a partnership, in the main library. A highly visible location in the library was identified and renovation was begun. In May 2001, the Dean and Vice President signed a Memorandum of Understanding<sup>2</sup>, approved a budget of \$680,000 over three years, and named search committees for DMS staff. Primary goals for the digital production facility were identified: 1) to digitize, store, and deliver instructional materials for faculty at no cost, and 2) to provide drop-off services for conversion of all media formats: print, still and moving images, and sound.

The Memorandum of Understanding is an important document for such a partnership because it identifies responsibilities among the parties and assures constituent groups of opportunities for evaluation and further decision-making in a specified time period. In this case, an evaluation after two years of operation enables both partners to assess the service and decide if continued support is warranted. The agreement, signed by the Dean of Libraries and the Vice President for Research and Information Technology, briefly covers governance, partners' responsibilities, referral and training, publicity and public relations, facility compatibility issues, posted and regular hours, timeline for assessment. Contributions of the University Libraries include prime space in the main library, participation of three librarians on the DMS Steering Committee, routine support of DMS staff, and assistance with interpretation of copyright and fair use. The Office of Information Technology contributes the funding for staff, equipment, maintenance, furnishings, renovation, and operating costs.

### Further Collaboration

DMS collaboration goes beyond the two sponsoring entities on campus. Various stakeholders were consulted during the planning stages and continue to have involvement through advisory groups. A Steering Committee of three librarians and three technologists served as transitional managers before full staffing was achieved. They planned the space renovation and furnishings,

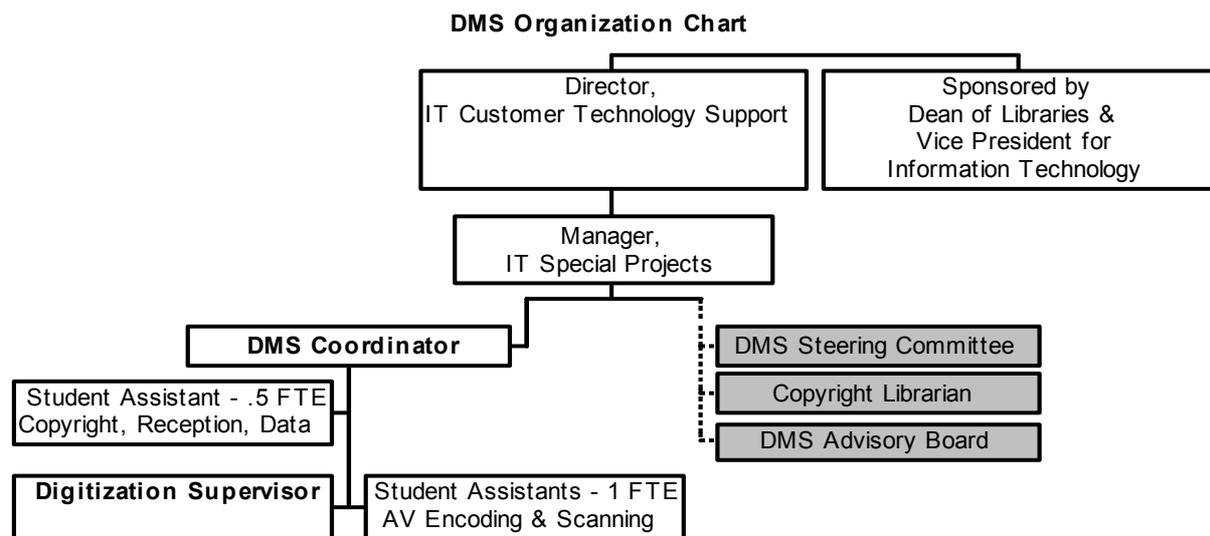
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<sup>2</sup> See Memorandum of Understanding in Appendix A.

established the first-year budget and purchased equipment, led the search for full-time staff, and designed initial publicity campaigns. The service actually began operation in June 2001 when the Digitizing Specialist was hired. The DMS Coordinator was hired in August, and a Grand-Opening event occurred in November. The Steering Committee meets bimonthly with the DMS Coordinator and Digitizing Specialist to confer on operational matters, policies, budget, and planning.

The DMS Coordinator formed an Advisory Board in January 2002. This group consists of other stakeholders including representatives of various IT units (Customer Technology Support Group, Computing & Networking Services, Innovative Technology Center, Unix Group, and Business Office), faculty from fifteen academic departments, Distance Education, University Relations, and the Technology Committee of the Faculty Senate. Meeting quarterly, the advisory group provides input on matters of procedure and policy to facilitate the primary goals of the service. They will also be an important part of the assessment process.

The following organization chart shows both the reporting and advisory structures for DMS.



### Service Operations

DMS, operating from one convenient campus location, acts as a singular source for the digital media needs of faculty by offering digitization, copyright clearance, and referrals to related agencies. DMS digitizes, stores, and delivers audio, video, still images, and text for instructional use at no cost to faculty. Fee-based services are also available for other users. Digitized materials are uploaded to the DMS server and made available via the internet.

Copyright tracking and compliance are important concerns of any digitization facility, therefore DMS file use is restricted. Access to DMS-created files is limited to UT users for the term of the associated class and requires a university “NetID” and password for login. If used with the

Blackboard course management system, only students enrolled in the course have access to the files. To further protect copyrights, links to the files are disabled at the end of the semester. If copyright clearance is needed for an item, DMS assists in securing the permissions. Other copyright management issues such as interpretation of “fair use” for instruction and research are offered in conjunction with the Libraries’ copyright guidelines and consultation librarian.

### Prerequisites

Creation of digital media files requires an inventory of high-end computers, audio and video playback and capture equipment and supporting software. DMS maintains three audio/video workstations supported by both a PC and a Macintosh computer, various audio and video playback devices, and related software. An additional PC workstation used for scanning images and text is equipped with a flatbed scanner, a film scanner, and related software. In addition to at least nine gigabytes of internal storage in each machine, the stations share three 80-gigabyte external hard drives and three 120-gigabyte RAID arrays.<sup>3</sup>

Digital files, especially video files, can be quite large. Storage and delivery of these files require adequate server size and speed. DMS employs two Sun E220R servers and two Sun StorEdge A 100 arrays. One server acts as the primary server and is backed up to tape each night. The second or backup server mirrors the primary server four times daily. Both Real Media and QuickTime files are streamed via Real Server 8 running on the primary server.

Audio and video files are encoded to Real Media and/or QuickTime formats. Text documents are output as PDF files while images are typically saved as JPG’s. Other file formats are supported at customer request. Real Media using SureStream technology is the preferred output format because it allows the media to scale with the connection speed. The one-file/multiple bit rates scheme also makes file management simpler. While campus users have high-speed access, most off campus users are connecting at 56k. However more off campus users are adopting broadband alternatives (i.e., cable modems and DSL) as they become available.

### Campus Impact

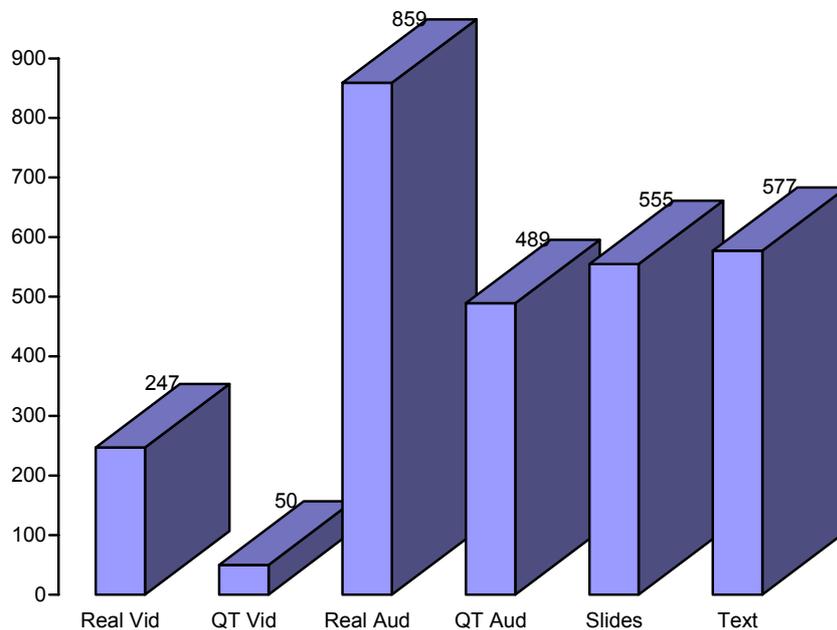
After less than one year of operation DMS has proven successful in becoming an integral cog in the university’s emphasis on technology in instruction. Ninety-six clients from more than forty academic units plus several non-academic areas have engaged digitization services at DMS. Modern Foreign Languages and Psychology are the most frequent users, but colleges across campus have used the service. Figure 1 indicates that digitization and streaming of Real audio files have been the most popular offering at DMS followed by text and slide scanning.

### The Future

Several areas are key to the success of DMS. Sustainability of technological currency, customer service, outreach, and staff training are each components of maintaining a quality operation for faculty. DMS can potentially affect the outcomes correlative to learning and must weigh this responsibility when looking to the future.

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<sup>3</sup> See Equipment and Software Detail in Appendix B.



**Figure 1**  
**DMS File Type Output 2001-2002**  
**(through March 2002)**

Keeping pace with the ever-changing technological trends through equipment refresh is imperative for positive results at DMS as is adopting emerging technologies. MPEG4, wireless access, the growing use of PDA's, live web casting—each of these brings with it more flexibility for the end user and more challenges for the provider. DMS must effectively deliver emerging solutions.

Customer service will continually be an emphasis for DMS. Convenience and reliability are excellent customer incentives. If already overburdened faculty members know they can access digitization services plus support for other media or technology needs all under one roof, they are more inclined to return to DMS for assistance and to recommend DMS to their peers. DMS is a “service” and must live up to that moniker.

Visibility on campus is equally important, and interaction with all colleges is vital. In its early stages DMS may well have been the best-kept secret on the UT campus. Future outreach must extend to each of the diverse academic units across campus. Regardless of the services offered, without users DMS will not continue to receive funding.

Because DMS employs student workers, careful attention must be paid to ongoing training. Student digitizing specialists are on staff at DMS for two or three semesters at the most. Continual turnover is more likely. Therefore, an effective training program must be concise yet thorough. Standards must be established to ensure ongoing quality control.

## Conclusions

As a production and support system for faculty moving to new ways of using technology in their daily instructional activities, DMS is an innovative solution. A service that offers speed and reliability, not only in the digital conversion process but in storing the files and serving them on demand, benefits faculty, students, and the institution as a whole.

Depending on the campus environment, it may well be necessary for an academic library to move ahead on its own in creating online digital media resources for the support of instruction. However, investigating and encouraging cooperative efforts between information technology units and library units in such an endeavor is an especially productive alternative. The benefits of sharing costs and expertise bring a whole new synergy to such a project. And because the work of converting resources to digital form will be ongoing, that collaborative effort over time will reap even more benefits.

## References

Bayne, Pauline S. and Hodge, Chris. "Digital Audio Reserves: A Collaborative Project at the University of Tennessee." *Journal of Interlibrary Loan, Document Delivery & Information Supply* 11, no. 4 (December 2001): 25-36.

**Appendix A**  
**Digital Media Service**  
**Memo of Understanding**  
**April 19, 2001**

UT Office of Research and Information Technology and UT Libraries agree to enter into a partnership to create a Digital Media Service (DMS) for the University community. Initially the partnership will focus on digitizing and storing media in all formats -- audio, video, text and images -- for instructional use by faculty, at no cost to individual faculty members or their departments. Other projects requiring some aspects of digital production and supported by the steering committee may also be pursued. Digital Media Services will be implemented initially as a pilot project.

Digital Media Service will receive general guidance and oversight from an Advisory Group representing the major stakeholders, including Customer Technology Support, the Libraries, the Innovative Technology Collaborative, Information Technology Engineering, the Faculty Senate, and faculty who have been early adopters of digital media in teaching.

During the pilot phase, operational and management issues will be handled by a Steering Committee composed of:

Stan Pinkleton, CTS	Tamara Miller, Libraries
Chris Hodge, CTS	Aubrey Mitchell, Libraries
DMS Coordinator, CTS (to be hired)	Pauline Bayne, Implementation project leader Libraries

The Steering Committee and the Advisory Group will report jointly to Brice Bible (ORIT) and Barbara Dewey (Libraries).

A true collaboration, Digital Media Service will be jointly sponsored by the UT Libraries and ORIT. DMS will be housed in Hodges Library and managed by ORIT. The ORIT responsibilities include providing equipment, equipment support and maintenance, staffing, furnishings, wiring, and renovation costs. The Libraries responsibilities include housing the facility in Hodges, staff support, and miscellaneous supplies. Digital Media Service will be integrated into the Libraries' service environment with regular and posted hours of services with the context of Hodges open building hours. Digital Media Service staff, reporting to Customer Technology Support, and Library staff will work together to provide a user-centered service. Guidelines will be developed to ensure proper referrals to related support services in the Library, the Division of Information Infrastructure, and elsewhere on campus.

To make the service compatible with other library facilities and services, Digital Media Service will have:

- Signage compatible with Hodges Library
- Quality furnishings
- Regular and posted hours of service
- Staff access to Hodges Library only when the building is open, except for emergency situations

Digital Media Service is projected to begin operation in May 2001 with a two-year pilot phase. Announcements and informational materials will reflect the model partnership behind the Digital Media Service.

In addition to regular operational reporting, a review will be undertaken in Spring 2002. This will be an opportunity to assess the effectiveness of the service, review resources, and engage the Advisory Committee in planning for the future of Digital Media Service.

\_\_\_\_\_  
Date \_\_\_\_\_  
Brice Bible, Assistant Vice President for Information Technology

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Date \_\_\_\_\_  
Barbara I. Dewey, Dean of Libraries

## **Appendix B Equipment and Software Detail**

### **Audio / Video Digitizing Stations**

Mac G4  
PC-Dell Precision Workstation 330  
Maxtor 80 Gb external hard drive  
VST 120 Gb RAID array  
Dazzle Creator II PCI video capture card  
Dazzle DV bridge analog/DV converter  
Tascam CD-A500 CD Player/Cassette deck  
Sony PCM-R300 DAT recorder  
351 31 band graphic equalizer  
Sennheiser eH2270 headphones  
Mackie 1202 VLZ Pro 6 channel audio mixer  
Videotronics digital video mixer  
Sony SLV-N71 VHS VCR  
Canon Optura PI digital video camera  
JVC 9" color monitor  
Apple Final Cut Pro  
Appleworks  
QuickTime Pro (Mac and PC)  
Microsoft Office Professional 2000  
Photoshop 6  
Cleaner 5  
Sound Forge 4.5

### **Scanning Stations**

Dell Optiplex GX110 PC  
HP Scanjet 6390C scanner  
Nikon Coolscan 4000 ED film scanner  
Adobe Acrobat 5

Microsoft Office 2000  
PhotoShop 6