

**FOREWORD**

Digital information seems to dominate our lives because it is new and because we are inventing the ways to work with it. The Internet has made available unprecedented levels and types of information—information that may be good or bad, structured or unstructured, documented or unauthenticated. Research libraries—which historically provide printed information that is organized, authenticated, searchable, accessible in a structured way, and archived for the long term—are struggling to bring similar order and authenticity to the world of digital information and to digital culture itself.

At Harvard, the Library Digital Initiative (LDI)—a dynamic, five-year, University-wide effort (which we will extend to six years)—is creating the common infrastructure of catalogs, delivery services, and repositories required for the burgeoning number of digital materials held in collections throughout the Harvard University Library. LDI, which was created at the direction of the Harvard Corporation and funded by Harvard's Central Administration, is ensuring that Harvard can provide effective, long-term management for the digital materials that form an increasingly significant aspect of Harvard's library holdings. We have called it the Library Digital Initiative rather than the Harvard Digital Library because we do not think of it as something separate from the rest of the Harvard Library based on our massive print collections, but rather, as an integral part of the University Library.

This report covers the third of five years of planned work in the Library Digital Initiative. The inclusive dates of the report are July 1, 2000, to June 30, 2001—or the University's FY 2001. During this fiscal year, the LDI core digital infrastructure was enhanced by the launch of several new delivery systems, by the completion of three Internal Challenge Grant projects, and by the implementation of the new Harvard Geospatial Library.

LDI's accomplishments in FY 2001 contribute to the robust nature of Harvard's digital library infrastructure. These accomplishments are of importance to the students, faculty, and researchers who use Harvard's extraordinary collections every day. Over time, the value of these accomplishments—of this visionary investment on the part of the University—will be proven time and again.

Sidney Verba

Carl H. Pforzheimer University Professor and Director of the Harvard University Library
July 2001

Contents

2	Highlights
8	Internal Challenge Grant Program
11	Systems and Services in Use
16	Education, Communication, and Collaboration
19	Staff Contributions
20	LDI Committees

Harvard University's Library Digital Initiative (LDI) is a comprehensive and visionary five-year program (which we will extend to six years), launched in July 1998 to develop the University's capacity to manage digital information. Specific goals include:

- developing standard methods for acquiring and managing digital resources;
- building a common technical infrastructure to support the storage, organization, delivery, and archiving of digital library materials;
- providing a team of specialists to advise librarians and other key members of the Harvard community on critical issues that are unique to the digital environment;
- providing librarians and library staff with practical experience in a wide range of technologies and digital materials; and
- enriching Harvard's library collections with a significant set of digital resources.

Following two initial years of planning and development in the Library Digital Initiative, Harvard's core infrastructure—for safe storage, management, and access—is in place. As a result, the Library Digital Initiative, in its third year of operation, made a number of significant advances to the University's digital library. These range from launching the Harvard Geospatial Library to advancing the systems and policies governing digital acquisitions; from building on Harvard's already high standards for metadata to enhancing the quality of its reformatting and imaging services. FY 2001 was the inaugural year for LDI's formal program on digital preservation, and it was a year notable for pilots, trials, and research projects in collaboration with other institutions.

Digital Preservation

The long-term preservation of digital collections may well be the most important issue facing research libraries today. Digital materials are incredibly fragile, dependent for their continued utility on technologies that undergo rapid and continual change. In the world of physical research materials, many valuable research resources have been saved passively: acquired by individuals or organizations and stored in rarely visited repositories. These physical resources remain viable decades later. This will not be the case for their digital equivalents. Changes in computing technology ensure that, over relatively short timeframes, both the media and the technical formats of digital materials will become unusable. Keeping digital resources accessible to future generations will require conscious effort and continual investment.

The preservation of digital objects presents new challenges to librarians everywhere. In FY 2001, the inaugural year for digital preservation services at Harvard, the LDI team's efforts focused on:

- development of a preservation policy for digital objects stored and managed by the Harvard University Library's Digital Repository Service (DRS);

Offered as one of the DRS services, digital preservation policies and procedures ensure that stored objects will remain usable in perpetuity. Preservation requires active monitoring of file formats and affordable strategies to transform data to new formats to keep pace with inevitable changes in technology.

- analysis of the requirements needed to document, validate, and monitor file formats in order to guard against threats of obsolescence.

These requirements will evolve as preservation guidelines for deposits to DRS.

In FY 2001, Harvard received a planning grant from the Andrew W. Mellon Foundation—one of six such grants awarded nationwide—to study the technical, organizational, and economic issues involved in archiving electronic journals. E-journals constitute the largest category of electronic resources acquired by libraries today. Harvard, for example, currently subscribes to several thousand such journals. When subscribing to printed journals, libraries receive and hold copies locally and—potentially—in perpetuity. The content resides on the shelf. By contrast, when a library subscribes to an E-journal, it typically acquires only a license to access the materials held in the publisher's system.

As with all digital materials, continuous effort and investment will be required to maintain the vitality of E-journals over time to prevent obsolescence caused by continuous technological change. Precisely who will have the responsibility, the resources, and the expertise to maintain and preserve E-journals for the use of future generations is not yet clear. Harvard is studying these issues jointly with three publisher-partners—Blackwell Publishers, the University of Chicago Press, and John Wiley & Sons.

In FY 2001, Stephen Chapman, the LDI reformatting advisor, published the article, "Content Follows Form: Preservation via Systems Design" in the Winter 2001 issue of *Microform & Imaging Review*. Another article, "Preserving Scholarly E-Journals" by Dale P. Flecker, associate director of the University Library for systems and planning, will be published in the September 2001 edition of *D-Lib Magazine*.

Harvard Geospatial Library

The Harvard Geospatial Library (HGL) is an innovative combination of library and analytical laboratory services. The goal of the HGL, formerly known as "Geodesy," is to enable students, faculty, and other members of the Harvard

community to perform meaningful geospatial analyses within the strict time requirements of a problem set, a term paper, or a real-world issue. Once the province of land-use planners and geoscientists, geospatial analysis is a tool that is increasingly valued in many disciplines. These include, but are not limited to, economics, the social sciences in general, business and marketing, engineering, archaeology, environmental studies, and the health sciences.

In any discipline concerned with geospatial analysis, researchers face the challenges of finding relevant and interesting data, obtaining it in a useable form for analysis, and accessing appropriate computing platforms. Each of these three issues is addressed in the Harvard Geospatial Library. The first phase of this project is scheduled to go online in Fall 2001 with ten frequently requested geospatial data sets available at the outset.

Pilots, Trials, and Research Projects

With LDI, Harvard created a vehicle through which the University and its libraries can take part in pilot programs, trials, and research projects in collaboration with other institutions.

LOCKSS

<http://lockss.stanford.edu/>

Harvard University is participating in the beta test of LOCKSS (Lots of Copies Keep Stuff Safe), a project of Stanford University's Highwire Press. The goal of LOCKSS is to preserve access to scientific journals published on the web by maintaining multiple copies at various sites and by conducting periodic comparisons among them to ensure that materials remain consistent and authentic. The system aims to ensure that digital resources are protected through large-scale replication. Several generations of the beta software have been installed. Preliminary tests are validating the system architecture and underlying protocols.

Virtual Data Center (VDC)

<http://thedata.org/>

With support from the National Science Foundation (NSF) Digital Libraries Initiative Program and in partnership with the University of Michigan, the Harvard University Library and the Harvard-MIT Data Center (HMDC) are developing an open source "digital library in a box" for social sciences data. Beta versions are available. The production service is now in use at HMDC and will be in the near future at Radcliffe's Murray Research Center. This release provides a lightweight digital repository service, a Z39.50-enabled cataloging service, integrated online exploratory data analysis, Open Archives Initiative harvesting interfaces, and support for the creation, cataloging, and preservation of distributed virtual collections.

Advisory and Technical Services

In addition to developing a robust technical infrastructure for digital library materials, LDI provides expertise and assistance to the University's libraries, archives, museums, and research projects that are involved in collecting or creating digital resources. These advisory and technical services fall into three main areas:

- digital acquisitions;
- metadata; and
- reformatting.

Digital Acquisitions

LDI's digital acquisitions coordinator assists Harvard librarians in addressing issues related to the licensing and the acquisition of digital resources, including product evaluation, license negotiation, and vendor management. Throughout the University, the rate of digital acquisition increased dramatically in FY 2001.

- Nearly 1,850 new resources—including 1,792 electronic journals—were licensed and made available to the Harvard community through HOLLIS. This represents more than a four-fold increase in acquisitions over the previous year. License agreements negotiated with major journal publishers, including John Wiley & Sons, Oxford University Press, Kluwer Academic Publishers, and Elsevier Science, accounted for the majority of the new acquisitions. Other significant publishers with whom licenses were negotiated are Cambridge Scientific Abstracts, Economist Intelligence Unit, and Nature Publishing Group.
- At Harvard, the level of acquisition of commercial digital resources is growing rapidly. Combined expenditures for electronic resources shared among the Harvard faculties exceeded \$1.2 million in FY 2001.
- Expanded procedures, documentation, and forms for Harvard-wide digital acquisitions were developed and made available on the Digital Acquisitions web site. These include a review process for resources requiring specialized technologies. The site, located at <http://hul.harvard.edu/digacq/>, continues to provide a single point of access to trial resources, licensing information, and evaluation guidelines, as well as links to related resources.
- A standard license notice was implemented in the HOLLIS portal that alerts users to the terms of license and conditions of use for Harvard's electronic resources.

- COERS, the Committee on Electronic Resources and Services, reporting to the Digital Acquisitions and Collections Committee, evaluates prospective electronic resources and oversees a stewardship program for ongoing resource evaluation.
- Harvard continues to be active within the Northeast Research Libraries Consortium (NERL), an organization now comprising 21 leading research institutions. NERL was founded in 1996 as a collective effort to contain the costs of electronic purchases and to influence market developments through joint licensing agreements. With the recent addition of Stanford University, NERL has become an organization of national reach.

Many of the most costly and most widely used electronic resources shared among and cooperatively purchased by Harvard's faculties and their libraries—such as the ISI web of science citation indices, Academic Universe, and databases published by the Congressional Information Service—are now acquired through NERL. Harvard negotiated several major contracts and license agreements on NERL's behalf in FY 2001, including the Economist Intelligence Unit and the license agreement for *Nature*.

Harvard participates in NERL's BYTES (Books You Teach Every Semester) program, a one-year pilot project funded by the Andrew W. Mellon Foundation. BYTES has analyzed the overlap in course reserve reading lists among eight NERL libraries in an effort to identify a core collection of monographs that would be useful in electronic form. The project's final report, submitted to the Mellon Foundation in July 2001, has generated wide interest within the library and electronic publishing communities.

Metadata

Digital library systems are driven by metadata—that is, the information that makes it possible to find, access, use, and manage digital resources. LDI's metadata analyst provides expert advice and design assistance for projects involving a wide variety of digital materials. This year, working with local subject and format experts, metadata advisory services have contributed to:

- adapting the Making of America II DTD (MOA2) for use as the foundation of LDI's Page Delivery Service (PDS), and creating specifications for the conversion of metadata for the annual reports of the presidents of Harvard and Radcliffe.

Harvard is using a variant of MOA2 to encode structural metadata for the delivery of imaged texts—that is, for multipage objects where “page-turning” is required. The University has also participated in the development of METS (Metadata Encoding and Transmission Standard), the follow-on standard to the MOA2 DTD.

- devising functional specification of the Full-text Search (FTS) service for indexing digital texts.
- developing the set of technical metadata needed in the Digital Repository Service (DRS) for digital audio files.

This builds on last year's work, but focuses specifically on supporting the collection management and migration needs within the context of the DRS.

- designing the cataloging workflow and the metadata modeling for the Harvard Geospatial Library.

This project uses both MARC21 (Machine Readable Cataloging Standard) and FGDC (Federal Geographic Data Committee standards) metadata to provide access to geospatial information in the Harvard libraries.

- planning several projects to improve access to and use of images at Harvard.
- evaluating the OASIS reference model as a foundation for the development of an electronic journal archive.
- investigating, with Harvard-Yenching Library, the metadata requirements for a potential union catalog of Chinese rubbings.

Reformatting

Digital library collections are created in part when materials in existing, traditional collections are digitally reformatted. Reformatting involves document preparation, metadata creation, scanning, image processing, and quality control. LDI's reformatting advisor advises curators on appropriate reformatting strategies, helps managers to locate skilled vendors, and negotiates for products and services that conform to Harvard's guidelines. This year, reformatting advisory services have concentrated on:

- reviewing Harvard's digitization policies and procedures;

With sponsorship from the Digital Library Federation, Harvard hosted a meeting of 20 national experts in March to consider ways in which the quality of digital images and digital imaging systems might be fairly evaluated.

- analyzing costs and benefits of text conversion to create digital images and searchable text.

Through the Internal Challenge Grant Program, Harvard's libraries and repositories can achieve specific goals for digital collections and LDI can enhance its digital infrastructure and test its systems and services. Libraries and library-sponsored programs throughout the University propose projects and contribute funds to their completion. Proposals selected by the LDI Grant Review Committee are implemented collaboratively by the LDI team with staff members of the proposing libraries.

To date, twelve projects have been funded through the LDI Internal Challenge Grant Program. Project goals range from digital conversion of analog materials to the development of new systems for the delivery of material that is "born digital." In FY 2001, three projects were completed, three new projects were funded, and six projects continued in development.

Completed in FY 2001

The Harvard–Radcliffe Online Historical Reference Shelf

Launched in the summer of 2001, the Harvard–Radcliffe Online Historical Reference Shelf (HROHRS) was proposed as a joint venture, with the Library Digital Initiative, of the Harvard University Archives and the Radcliffe Archives. HROHRS is a web site, located at <http://hul.harvard.edu/huarc/refshelf/HROHRSHome.htm>. It provides electronic access to frequently consulted sources on the history of Harvard and Radcliffe. To date, the Reference Shelf includes:

- founding documents concerning Harvard, from 1642 to 1814;
- annual reports of Harvard and Radcliffe presidents and treasurers, from 1825 to the present;
- narrative histories; and
- access to the Harvard Fact Book from 1997 to the present.

Creation of the Online Historical Reference Shelf required the scanning of over 105,000 pages of text—accomplished by the Harvard College Library Digital Imaging Group—from the archives of both Harvard and Radcliffe. The resulting digital images were sent to a vendor for full-text conversion using OCR. Structural metadata was produced in XML (extensible mark-up language). All of these digital files are located in the Digital Repository Service (DRS).

From its inception in 1999, the Harvard–Radcliffe Online Reference Shelf was intended to provide more than a searchable collection of the University's historic texts: it was also meant to demonstrate two new digital library services: Page Delivery Service (PDS), and Full-text Search service (FTS). The image files are delivered through the PDS and the full-text is made searchable through FTS.

In a separate phase of the project schedule for FY 2002, the Archives will evaluate the project from the users perspective.

Nineteenth-century American Trade Cards

This project, completed in September 2001, enabled the Harvard Business School to catalog, digitize, and display through the Visual Image Access catalog (see VIA, page 14) 1,000 advertising trade cards selected from the Historical Collections at the Baker Library. As indicators of consumer habits, social values, and marketing techniques, trade cards are of interest to scholars of business history, American studies, graphic design and printing, and social and cultural history.

A selection of trade cards from the project is also currently on display in an online exhibition organized by the Historical Collections Department of Baker Library. The exhibition is entitled "A New and Wonderful Invention—The Nineteenth-century American Trade Card," and it can be found at <http://www.library.hbs.edu/hc/exhibits/tcard>.

The Hedda Morrison Photographs of China

Completed in April 2001, this LDI grant project provides access through VIA to a collection of nearly 4,800 photographs taken between 1933 and 1946 by the German photographer Hedda Morrison. The photographs, which are among the holdings of HCL's Harvard–Yenching Library, were cataloged and digitized for teaching and research in the areas of East Asian studies, history, architecture, fine arts, sociology, and religion.

Funded in FY 2001

Web-based Course Material Archiving Project: Study Phase

The Francis Loeb Library of the Harvard Design School proposed a study that would lead to a set of procedures and a technical infrastructure for the documentation and archiving of digital course materials in various formats. The study will also identify formats of materials, copyright issues, documentation standards, use/access models, technological infrastructures, and implementation methodologies.

Schlesinger Library Encoded Archival Description Evaluation and Retrospective Conversion Project

Over the course of 30 months, this project will investigate, evaluate, and select an EAD mark-up methodology to convert finding aids to browser-usable formats, and to contribute a significant number of finding aids to the Online Archival Search Information System (see OASIS, page 13).

[Harvard College Library Finding Aids Conversion Pilot Project](#)

Through the LDI Internal Challenge Grant Program, HCL will conduct a two-year pilot project to develop a model for full-scale conversion to EAD of finding aids at Harvard. A minimum of 48,000 pages will be converted and contributed to OASIS as part of this project.

Ongoing Grant Projects[Harvard Geospatial Library](#)

Harvard College Library Social Science Program

[Asian Art Images](#)

Harvard University Art Museums/Fine Arts Library (HCL)

[Music from the Archive: A New Model of Access to Rare and Unique Sound Recordings](#)

Eda Kuhn Loeb Music Library (HCL)

[Western China and Tibet: Hotspot of Diversity](#)

Arnold Arboretum Library of Harvard University (FAS)

[Maya Archaeological Photographs from the Carnegie Institute of Washington Collection](#)

Peabody Museum of Archaeology and Ethnology (FAS)

[Harvard Biomedical Image Library \(BIL\)](#)

Countway Library of Medicine (Harvard Medical School)

More information about these projects is available at:

http://hul.harvard.edu/ldi/html/funded_projects.html.

As FY 2001 came to a close, twelve systems and services, developed at Harvard by the Library Digital Initiative, were in use throughout the Harvard University Library system.

[Digital Repository Service](#) <http://hul.harvard.edu/ois/systems/drs/>

Through the Digital Repository Service (DRS), Harvard provides professionally managed, secure, long-term storage and preservation services for digital objects. Working in concert with the Name Resolution Service (NRS) and the Access Management Service (AMS), DRS provides persistent access to networked resources and can restrict access to the Harvard community.

This year, 241,601 digital objects from three LDI grant projects were deposited in the DRS. Objects include image files and associated metadata files to aid in the navigation and the search for images.

[E-reserves](#) <http://ereserves.harvard.edu>

The E-reserves system is a web-based service that provides students with online access to course reserve reading materials. E-reserves, in full-scale production since 2000, is currently limited to shorter print materials, such as articles and book chapters. Material available through E-reserves is secured to registered students following the fourth week of each term. During the 2000–01 academic year, the E-reserves system supported a total of 85 courses offered by either the Faculty of Arts and Sciences or the Harvard Divinity School.

[Harvard College Library Digital Imaging Group \(HCL DIG\)](#) <http://preserve.harvard.edu/dig/>

HCL DIG, a group within HCL's Preservation & Imaging Services, is dedicated to producing high quality reproductions of a wide range of library and archival materials. In operation since July 1999, HCL DIG provides document scanning, film scanning, digital photography, image processing, metadata creation, and DRS deposit services for digital still images. Now in its second year, the group is staffed by a manager, four photographers, and a computer specialist/programmer. During FY 2001, the group produced more than 22,000 black-and-white images and more than 7,000 color images in support of LDI, HCL, and E-reserves projects.

[HOLLIS Portal](#) <http://lib.harvard.edu>

The HOLLIS Portal is a comprehensive web interface—or portal—that presents a single, organized view of web-accessible resources available to the Harvard community. Over 1,009,000 sessions—or individual user connections—were logged in HOLLIS this year. More than 1,800 resources were added, including a variety of indexes and full-text resources. New resources in FY 2001 include:

- the “Past Masters” series of major philosophical texts;
- the AccuNet Associated Press Multimedia Archive;
- *American National Biography Online*;
- *Art Index Retrospective*;
- more than a dozen databases from *Cambridge Scientific Abstracts*;
- three new economics databases from the Economist Intelligence Unit;
- the *New Grove Dictionary of Music and Musicians*; and
- the Universal Database of Russian Newspapers.

New electronic journals added this year include titles from Elsevier Science, John Wiley & Sons, Oxford University Press, Kluwer Academic Publishing, BioOne, and new JSTOR collections in the areas of general science, ecology, and botany.

A new system design was launched in August 2000 and substantial interface enhancements were made in January 2001.

The HOLLIS portal also serves as an electronic “front door” to Harvard’s union catalogs and to comprehensive information about Harvard’s libraries.

HUL Access Management Service

The Access Management Service (AMS) coordinates several steps necessary for the security of networked resources. These steps include user authentication, profiling, authorization, and access protocols specific to categories of resources. Authentication is performed by the University’s central PIN service. Profiling information on authenticated users is retrieved from the University Directory Service. AMS can also serve to restrict access to specific resources when licensing or other agreements require it. Overall, the service, designed to minimize the need for repeated authentication of users, is available to all of the University’s libraries. Over 1,400,000 requests for access to restricted resources were handled by AMS in FY 2001.

Image Delivery Service

The Image Delivery Service (IDS) delivers digital images that are stored in the Digital Repository Service (DRS) to web browsers. In general, images available through this service have been converted from photographs, slides, prints, and other two-dimensional media held in special collections throughout the University. IDS can secure images to the Harvard community (i.e., those with a Harvard ID number and PIN) when appropriate. Currently, IDS is the service that delivers many of the digital images described in the VIA catalog, but it can also serve images cataloged in HOLLIS, OASIS, or any other catalog or web site that supports URL linking.

Name Resolution Service

The Name Resolution Service (NRS) provides digital objects with persistent, location-independent identifiers that ensure network access regardless of an object’s physical location, which may change freely over time, much as a book’s call number allows it to be moved from place to place.

Names and their associated URLs can be created and maintained through:

- HOLLIS portal update procedures (for portal resources);
- DRS (for deposited objects); or
- direct interactive and batch interfaces to the administrative system.

In FY 2001, NRS has responded to more than 1,600,000 requests for name resolution. It has provided more than 17,000 resources, including HOLLIS portal resources and VIA images, with persistent names.

OASIS

<http://oasis.harvard.edu/>

OASIS (the Online Archival Search Information System) is a web-based union catalog of 365 archival and manuscript finding aids created by archives, repositories, and academic departments throughout the University. Curators and archivists contribute to OASIS using SGML or XML to convert print finding aids into digital form. Current participants in OASIS are:

- Andover–Harvard Theological Library (Harvard Divinity School);
- Arnold Arboretum Horticultural Library in Jamaica Plain (FAS);
- Baker Library (Harvard Business School);
- the Botany Libraries, including Arnold Arboretum Main Library, Farlow Reference Library of Cryptogamic Botany, and the Library of the Gray Herbarium Archives (FAS);
- Eda Kuhn Loeb Music Library (HCL);
- Environmental Science and Public Policy Archives (HCL);
- Fine Arts Library (HCL);
- Harvard University Archives (HUL);
- Houghton Library (HCL);
- Peabody Museum Archives (FAS); and
- Schlesinger Library on the History of Women in America (Radcliffe).

A major enhancement project to provide XML as well as SGML support and XSL-based delivery of finding aids was completed in the summer of 2001.

OLIVIA

<http://hul.harvard.edu/ois/systems/olivia/>

OLIVIA is a cataloging support system that supplies descriptive data about visual resources to the VIA catalog. It is Harvard’s first centrally supported cataloging environment specifically designed for images. It currently contains over 242,000 entries for slides, photographs, prints, posters, trade cards, and other

visual materials. OLIVIA currently has approximately 40 users from six repositories:

- Arnold Arboretum Horticultural Library (FAS);
- Baker Library (Harvard Business School);
- Fine Arts Library (HCL);
- Frances Loeb Library (Harvard Design School);
- Harvard–Yenching Library (HCL); and
- Weissman Preservation Center (HUL).

The major developments for OLIVIA this year include the creation of a staff training program and an extensive review and revision of the controlled vocabulary lists used in the system.

Page Delivery Service (PDS)

PDS, launched in the summer of 2001, is one of several delivery services developed for the LDI technical infrastructure. PDS delivers scanned page images to the web browser and allows the user to navigate through the digitized materials, such as a single-page diary entry, a 500-page article, or a set of annual reports. To enable navigation through a specific object, it is necessary to capture information about the structure of the material. This structural information is stored in XML files. The Harvard and Radcliffe annual reports comprise the first data set available through PDS. These reports include 105,000 scanned page images. Access to the Harvard and Radcliffe Annual Reports is available at <http://hul.harvard.edu/huarc/refshelf/HROHRSHome.htm>. HCL's Eda Kuhn Loeb Music Library and the FAS Arnold Arboretum Horticultural Library are currently preparing materials for use in PDS.

Full-text Search Service

The Full-text Search Service (FTS), which went live in the summer of 2001, provides a mechanism for efficient indexing and retrieval of textual digital objects. Search options include boolean operators (AND, OR, NOT), quoted phrases, and proximity. For indexed text items that have dates associated with them, searches can be qualified by a date or date range. The FTS server is accessed as an option of the Page Delivery Service (PDS) for searching the full text (such as OCR) of page-turned objects. The FTS server can also be accessed directly, as in the case of the Harvard–Radcliffe Online Historical Reference Shelf.

VIA <http://via.harvard.edu:748/html/VIA.html>

VIA is a web-based, union catalog describing the photographs, prints, drawings, paintings, and other visual resources held by Harvard libraries, archives, and museums. VIA contains more than 142,000 cataloging records and 27,469 “thumbnail” images. During FY 2001, its second full year of operation, VIA

averaged over 400 connections and 1,300 searches per month. The primary development for VIA this year was the upgrade of the OCLC SiteSearch software on which the system is built. Current contributors include:

- Baker Library (Harvard Business School);
- Fine Arts Library (HCL);
- Frances Loeb Library (Harvard Design School);
- Harvard University Art Museums (including the Fogg, the Sackler, and the Busch-Reisinger);
- Harvard–Yenching Library (HCL);
- Peabody Museum (FAS); and
- Schlesinger Library on the History of Women in America (Radcliffe).

The process of creating digital libraries—and the systems that support them over time—requires a continuous dialogue among faculty, librarians, administrators, curators, and a wide range of technical experts. Through a program of education, communication, and collaboration, Harvard ensures that the Library Digital Initiative is a well-spring of such dialogue here at the University and beyond its walls.

Public Forums

LDI uses a number of public forums to inform the community of activities and infrastructure development. LDI contributes regularly to University publications. Brown Bag Luncheons and open meetings are targeted to the Harvard library and museum communities that are using LDI systems and services. The LDI Speaker Series attracts well known speakers to the University and generally draws larger audiences.

This year, speakers in the Brown Bag Luncheon Series addressed a broad range of topics concerning digital libraries, from new concepts in digital preservation to improved discovery and access to web resources; and held a panel discussion by librarians and technology specialists on issues of user support. Open meetings included an introduction to new services offered in conjunction with the Digital Repository Service (DRS). The Speaker Series included:

- representatives of Great Britain's Higher Education Digitisation Service;
- Thom Hickey, chief scientist and acting vice president of OCLC; and
- Hector Garcia-Molina of Stanford University.

This series is copresented by LDI with the Division of Engineering and Applied Science (DEAS) and the Office of the Assistant Provost of Harvard University.

In addition, information related to LDI activities is posted on three web sites. The LDI web site at <http://hul.harvard.edu/ldi/> covers history and updated information about the program and includes links to relevant presentations, reports, and published articles. The OIS web site at <http://hul.harvard.edu/ois/> provides information about systems and services in production and includes system documentation and policies. The preservation web site at <http://preserve.harvard.edu/> has information about digital imaging, including standards related to reformatting.

Collaboration

Metadata Encoding and Transmission Standard (METS) <http://www.loc.gov/standards/mets/>

During the winter and spring of 2001, LDI staff members participated in the development of a new standard called the Metadata Encoding and Transmission Standard. METS is an XML schema that supports the encoding of structural metadata for all types of complex (i.e., multi-part) digital objects, no matter what the underlying formats or structure may be. It also supports the encoding of related metadata (be it descriptive, administrative, or technical) as appropriate. METS is the structural metadata standard underlying the new Page Delivery Service and will be an important part of the E-journal Archiving Project's technical implementation as a way of encoding the OASIS standard's various information packages.

Reference Linking

For two years, Dale P. Flecker, associate director of the Harvard University Library for planning and systems, has had a leading role in a national effort that links a number of publishers, libraries, and technology providers together with the National Information Standards Organization. Their collaborative goal is to develop a robust architecture that will support a rich environment of linking between citations and electronic journal articles.

This past year, a project involving a number of libraries and E-journal-related systems was conducted, demonstrating that the proposed architecture could provide links to the appropriate copies of articles distributed across several systems. At the end of the year, considerations about implementing this architecture for widespread use were well underway.

Dale Flecker coauthored an article entitled, "Linking to the Appropriate Copy," which appeared in *D-Lib* (September 2001). The article can be accessed at <http://www.dlib.org/dlib/september01/caplan/09caplan.html>.

Electronic Publications of the American Political Science Association (APSA)

Harvard University Library (HUL) is involved in two digital initiatives of the American Political Science Association. HUL houses and provides support for PROceedings (Political Research Online), a searchable collection of papers from the annual meeting of the association. In addition, HUL is a partner with the Association in a planning project, funded by the Andrew W. Mellon Foundation, concerning the establishment of a general preprint service and low-cost E-journal publishing system in the field of political science.

International Registry of Digital Reproductions

Several members of the LDI team have played key roles in the concept and planning for an international registry of digital versions of books and serials that originally appeared in paper format. Such a registry will help to eliminate unnecessary duplication during digital conversions while allowing libraries to improve access to materials being converted by other institutions.

Digital Imaging Practices

Stephen Chapman, the LDI reformatting advisor, coordinated a Digital Library Foundation (DLF) symposium of imaging practitioners to consider how the quality of digital images and imaging systems may be fairly evaluated. Hosted by Harvard University, the meeting first outlined the problem of why there is no reasonable way to look at all imaging performance measures without ambiguity. Then, it proposed first steps toward a solution.

With William Comstock, manager of HCL's Digital Imaging Group, Chapman published an article entitled, "Digital Imaging Production Services at the Harvard College Library," which appears in *RLG DigiNews* in December 2000.

The Library Digital Initiative is staffed by experts in digital technologies; project managers responsible for developing systems and implementing grant projects; and a project liaison who provides the main, day-to-day contact between LDI operational staff and project participants. Many accomplishments in the third year of LDI were made possible through the addition of LDI funded staff and the allocation of current staff who are working to develop and support the program.

- Twelve new positions were established for LDI in the first three years of the program. These include systems librarians, programmers, system developers, and area specialists, two of which were hired in FY 2001.
- During the first three years of LDI, twenty-one temporary project staff were hired to work throughout the University on projects funded through the LDI Internal Challenge Grant Program. Thirteen positions were created in FY 2001.
- A number of existing staff members in the Office for Information Systems (OIS)—representing between four and five full-time equivalents—were reallocated to devote additional resources to LDI systems development and experimental projects. In addition, LDI oversight, administration, and support are provided by OIS and by the Harvard University Library (HUL).

Individuals and groups from across the University have contributed to LDI by serving on a number of related committees and task groups, and through their work in grant-funded projects.

LDI Committees

LDI Steering Committee

Nancy M. Cline, *chair*, Roy E. Larsen Librarian of Harvard College

Gary Anderson, Professor of Hebrew Bible, Harvard Divinity School

Dale P. Flecker, Associate Director of the Harvard University Library
for Planning and Systems

Barbara S. Graham, Associate Director of the Harvard University Library
for Administration and Programs

Harry S. Martin III, Professor of Law and Librarian of the Harvard Law School Library

Judith Messerle, Librarian of the Countway Library of Medicine,
Harvard Medical School

Thomas Michalak, Executive Director of Baker Library, Harvard Business School

Hugh Wilburn, Librarian of the Frances Loeb Library, Harvard Design School

Grant Review Committee

Donald Pfister, *chair*, Asa Gray Professor of Systematic Botany and
Curator of the Farlow Library and Herbarium, Faculty of Arts and Sciences

Peter Bol, Professor of Chinese History, Harvard College

Robert Buckwalter, Associate Librarian, Harvard Law School Library

Dale P. Flecker, Associate Director of the Harvard University Library
for Planning and Systems

William A. Graham, Murray A. Albertson Professor of the Middle East and
Chair of the Department of Middle Eastern Languages,
Faculty of Arts and Sciences

John Howard, Librarian for Information Technology, Harvard College Library

Judith Messerle, Librarian of the Countway Library of Medicine,
Harvard Medical School

July 2001

Library Digital Initiative

Dale P. Flecker

Harvard University Library

Office for Information Systems

1280 Massachusetts Avenue, Suite 404

Cambridge, MA 02138

617.495.3724

<http://hul.harvard.edu/ldi/>