

Standard Seven: Library and Other Information Resources

Overview

In the decade since Brandeis's last re-accreditation, higher education has seen a sea change in the generation, storage, and distribution of information. Thanks to the Web, digital imaging, and other technologies, today's information environment is far different from that of ten years ago. Like its peers, Brandeis confronts a number of challenges to long-standing assumptions about how libraries and technology work. Brandeis is successfully navigating this transition to a digital world through a focus on its mission, organization, planning, and investment. The University seeks to create a rich environment of people, technology, information, and facilities that will serve learning and research, while also providing high quality, accessible, and reliable systems to support decision-making, planning, and analysis.

It has been clear for awhile that the worlds of libraries and information technology are quickly becoming one. Technology has raised expectations about access to information and has blurred the lines of skills and responsibility. At Brandeis, the two organizations responsible for these areas, Information Technology Services (ITS) and the University Libraries, have collaborated for many years to provide more seamless services to the community. After pushing the limits of the collaborative model, these organizations were combined in 2005, making possible structural support changes. The guiding assumption was that library patrons and users of technology do not care who provides services; they simply want them, and preferably immediately.

Anecdotal evidence over the past year suggests that the combined organization has improved service. The combined organization permits Brandeis to maximize resources through planning and to invest in the technology and information resources needed for the Academy. At the same time, however, the incessant requirements of core infrastructure services demand constant attention to network and hardware upgrades, while also adding functionality and ensuring upkeep.

Library and Technology Services (LTS) regularly collaborates with other units at Brandeis and elsewhere to improve services, using the standards set by several professional groups to provide benchmarks and to ensure that best practices are followed. Among these groups are NERCOMP (Northeast Regional Computing Program) and EDUCAUSE, both of which strive to advance higher education by promoting the intelligent use of information technology, as well as the Boston Library Consortium (BLC). LTS also consults frequently with two internal committees to gather feedback on priorities, projects, systems and goals. The Library and Technology Services Advisory Committee, composed of faculty, staff and students, meets three times each semester; the Student Information Technology Advisory Committee, composed of three undergraduates and one graduate student, meets two or three times a semester. The activities, goals, and ongoing responsibilities of LTS are described for the University community in yearly program plans.

Description and Appraisal

Ten years ago, five different groups provided technology-related support and services at Brandeis. These groups—media services, administrative data processing, telecommunications, computing services, and web services—worked independently and reported to three different vice presidents. This made it extremely difficult to coordinate information technology projects or to carry out integrated planning effectively.

In 1999, to deal with these shortcomings, the University put the disparate components of technology under the direction of a Chief Information Officer (CIO). The position reported directly to the Executive Vice President and Chief Operating Officer, with a dotted line reporting to the Provost. Shortly after the CIO's arrival, media services, administrative data processing, telecommunications, and computing services were organized into Information Technology Services (ITS). ITS worked to correct a number of serious problems with the University's technology infrastructure, most of which involved failed investments in basic infrastructure requirements. During the last few years, attention has focused on three primary areas: utility (wiring, network, telephony, hardware), administrative systems (implementing Enterprise Resource Planning software), and partnership with the University Libraries to support teaching and learning.

Systematic investments in infrastructure have been made to resolve inadequate in-building wiring; upgrade network electronics; increase Internet bandwidth; improve classroom technology; enhance public computing, CATV, and telephony; improve support services; and provide refreshed, up-to-date computers for faculty and staff. Technological improvements have also been made to classrooms across the University. Although each of these investments was substantial, the largest by far was the investment in the core administrative information systems that form the basis for student administration and for managing the financial and human resources of the University.

By 2005, much had been accomplished: buildings were wired to standard; the campus network was state-of-the-art; Internet bandwidth increased to 100 MB, including the high speed Internet2; a desktop refresh program provided new computers to faculty and staff on a four-year cycle; over 80 percent of classrooms featured up-to-date technology; structured refresh cycles were implemented for classroom technology and public computing; and the PeopleSoft initiative brought state-of-the-art, integrated administrative information systems to finance, human resources, and student systems. Additional infrastructure enhancements included:

- A Voice over Internet Protocol (VoIP) phone system
- Standardized classroom technology
- Upgraded application servers

- Institution-wide backup services
- Revamped data center infrastructure with new wiring, redundant backup generator, uninterruptible power supply, new equipment racks, and HVAC
- Secondary data center
- Campus wireless access
- Easier off-campus access to library resources (EZproxy)
- A desk-top delivery interlibrary loan system (ILLiad)
- A new integrated library system (Ex Libris Aleph500)
- A digital asset management system (Digitool)
- Citation linking software (SFX)
- An online course management system (WebCT).

LTS now plans, manages, and maintains the hardware and software for the University. Over the past five years, the University has standardized instructional and administrative technology services and infrastructure. The network infrastructure, computing hardware and services, classroom technology, and Internet services are comparable to resources at other research universities and highly selective liberal arts colleges.

The University's investment over the last decade has enhanced opportunities for innovative course design and flexibility in meeting diverse needs and styles of learning among students. It has also made it more possible for researchers to collaborate with colleagues and to discover information resources. All of this has increased parity with competing institutions. Yet it remains an ongoing challenge to provide sophisticated, reliable, and robust systems for communications, and security and compliance with new regulations require constant monitoring and short cycles of replacement.

With the systematic improvements to the technology infrastructure since 1999, it is now possible to turn full attention to supporting the teaching mission of the University. In keeping with this focus—evident in the creation of Library and Technology Services—the CIO is now the Vice President and Vice Provost for Libraries and Information Technology, reporting both to the Executive Vice President and to the Provost.

Support of teaching and learning

As noted in Standard Six, the Student Satisfaction Inventory showed that what matters most to students is the quality of teaching. LTS plays an important role in meeting these expectations.

Since 1997, Brandeis has supported a course management system (WebCT), which enables faculty to manage their online course materials. Over two-thirds of the classes offered at Brandeis have at least one associated WebCT page. The Rabb School of Continuing Studies has also been using WebCT to offer distance learning.

This is just one aspect of the increased demand for service support. Internet use and service desk calls have also greatly increased. Class instruction, workshops, and instructional outreach offered by librarians have more than doubled since 1994. Other outreach efforts—tours, orientations, promotional events, and similar activities—have undergone similar expansion.

LTS offers a variety of instructional programs to increase information literacy and technical skills:

- The First Year Library Instruction Program (FLIP) works in conjunction with the University Writing Seminars (UWS) and University Seminars (USEM). This year, 81 tours were provided for 900 students, as well as 49 hands-on sessions. A comprehensive assessment of the First Year Library Instruction Program, undertaken in 2000, showed that three months after the class, students retained the skills taught.
- The Library and Technology Intensive Program brings together librarians, instructional technologists, and faculty to develop research instruction and technology-based solutions, tailored to specific courses and research assignments. Last year, these collaborations produced 89 intensive courses in 29 disciplines, plus eight intensive technology sessions in five disciplines. During this same period, LTS staff created 55 library resource web pages in support of these courses.
- Teaching and Learning Projects explore new and promising uses of library and technology resources. LTS staff worked with ten faculty teaching and learning projects last year alone.
- Through Professional Consultations, Research, and Instruction Services staff members meet with community members.
- Instructional Workshops focus on particular software or research topics in response to community need. Workshops last year included 16 on course management systems, three on Endnote, five on research tools, and 14 on Web publishing.

Like other universities, Brandeis is adapting to an emerging technical and social environment that challenges many of the traditional assumptions about information production and retrieval. Students entering the University in the next five to ten years will learn, communicate, and use technological tools in ways very different from those available today. Teaching and learning must assume new and different forms. Growth and change in scholarly publication

are driving new ways of storing and distributing knowledge. All of the changes—student and faculty expectations, increasing use of digital resources, online learning and support, and consortial arrangements—require the University to rethink its service model.

The traditional role of the library as a quiet study space with vast storage space for books and other print materials is not sustainable. The libraries of the near future will, of course, include books, but they will also be multi-use facilities with group study spaces, collaborative teaching areas, and open spaces for presentations and communal gatherings. The library will serve as an interactive space that encourages learning activities outside of the classroom. At Brandeis, for example, the Writing Center is a natural part of the library learning space. Services are likely to branch into non-traditional areas such as analytical skills support, peer technical support on questions about statistical software, or perhaps an intellectual hub disguised as a coffeehouse where patrons can simply enjoy reading a book.

Support of instructional facilities

Five years ago, hardly any Brandeis classrooms were equipped with current technology. Today, most classrooms provide ready access to data and video projection, sound augmentation, and VCR and DVD equipment. Brandeis has four computer classrooms, configured to allow all students in a class hands-on access to a computer. At the beginning of every semester, LTS staff members create a standard image of the software to be used in each of these classrooms, which combines standard supported software applications and special software applications requested by faculty. When not in use by classes, computer classrooms are available for general use. Brandeis also has four dedicated computer clusters, with 15 to 25 computers dedicated to drop-in use. These computers are fully equipped with standard software and maintained at a very high level of security.

The Instructional Technology Resource Center helps faculty and students to incorporate technology into teaching and learning. LTS staff members provide support for use of the course management system, digital imaging and editing equipment, course discussion lists, and specialized instructional software. There are computers, digital scanners, digital cameras (both still and motion), and other related types of equipment available for use either on site or for short-term loan.

Support of research and scholarship

Ownership and storage of books and information resources have long been the defining paradigm for research libraries. Since 1996, Brandeis University has spent more than \$30 million purchasing books, serials, other print materials, and various digital resources to enhance its collections. In addition to books, digital information resources and online services offer exciting opportunities for universities and colleges to expand support of learning, teaching, and scholarship. Research techniques are changing as scholars and researchers learn to manipulate digital texts and images. Digital information is changing expectations regarding the availability of resources, including books and periodicals. In FY2005, Brandeis offered access to 25,808 serial subscriptions; of

these, 23,000 were in digital format. This past year, just over 50 percent of the total library materials budget was spent on digital resources.

The LTS website serves as the primary access point to many of the University's information services and resources. Online request forms allow members of the community to request items through interlibrary loan, suggest information resources for purchase, and submit lists of resources for course support. Nearly all of the online information resources offered by LTS are accessible both on-campus and off-campus to community members. Course support materials (traditionally known as "library reserves") are increasingly being offered in digital format through the course management system. The integrated library system includes citation-linking software that leads students and researchers from brief descriptions of information resources to the full text online.

New technologies enlarge access in various ways. The digital asset management system holds Brandeis's digital collection of Daumier lithographs and the Fine Arts Department's collection of digital images. The interlibrary loan service makes use of the ILLiad software to deliver PDFs of requested articles to an individual's desktop. Online exhibits from the University Archives and Special Collections Department extend access to rare and unique materials. This past spring, LTS began a pilot project to deliver films on demand via the campus network. This greatly enhances the former "library reserves services," which offers only limited access to limited copies of films.

In every discipline, the increased volume of publications, available in a variety of formats (including books) and from multiple providers, has drastically altered traditional patterns of acquisition and delivery. Brandeis has long taken advantage of consortia and partnerships with other information providers to meet the needs of the Brandeis community. In the 1970s, Brandeis was a founding member of the Boston Library Consortium (BLC), which today has 19 members in four New England states. Membership in the BLC gives priority access to the information resources of BLC institutions, and also allows the University to offer online research assistance from professional librarians 24/7. Several of the University's subscriptions to digital information resources, including the Elsevier package, are negotiated as group licenses through the BLC or the NorthEast Research Libraries Consortium (NERL), in order to take advantage of group pricing and collaborative collection development. LTS also belongs to the Research Libraries Group (RLG), participating in the SHARES program for resource sharing. Brandeis was a charter member of the Association of Research Libraries (ARL) SPARC initiative (Scholarly Publishing and Academic Resources Coalition), recognizing early on the need for academic institutions to work together to take control of scholarly information.

LTS will continue to follow careful selection criteria when choosing books and information resources that are to be provided locally. Research collections will be developed to support ongoing, recognized programs, and will also highlight items that are rare or unique to Brandeis. Brandeis's Special Collections and University Archives materials will play an increasing role in informing the teaching, research, and scholarly activities of faculty and students. In FY2006,

Brandeis created a full-time Special Collections Librarian position as the first step in developing a comprehensive plan for the University's special collections. Digital access to special collections and archival materials will further increase their accessibility and allow Brandeis to contribute to scholarly resources worldwide.

As knowledge explodes and costs escalate, Brandeis must be able to offer information without excessive need for additional physical space, on-site or off-site. Over the past ten years, the libraries have added stack storage wherever possible, sometimes at the expense of user seating and user friendliness. Diligent culling of books and print materials will allow a steady influx of carefully defined groups of new materials. The University will keep only the most frequently used and currently relevant books and materials within the current buildings, while seeking solutions for dealing with little used materials. The pressures on facilities will likely push Brandeis toward providing the information resources required by the campus community through digital access and shared collections rather than through local ownership and on-site storage.

The new collection stewardship requires substantial cooperation between LTS and other academic partners, and between LTS and the faculty. LTS has created Information Resources Working Groups for each of the School Councils of the University. The Groups consist of faculty who help to establish collection priorities as part of the LTS Information Resources Assessment Plan. Reports are available from librarians on various academic departments, summarizing current status and explaining resource requirements.

The transition to more digitally oriented services is a challenge. Some people have decried the decline in reference desk patronage at academic libraries during the last ten years. Yet an analysis of library reference activity for FY2000 to FY2004 shows that a 25 percent decrease in library-based reference services has been fully offset by a rise in both email and chat reference. Email reference doubled over the same period, and chat reference transactions (new in FY2002) more than doubled between FY2003 and FY2004. In FY2004, email constituted 18 percent and chat reference 12 percent of all reference activity. Of the ten Boston Library Consortium schools participating in the service, Brandeis is first in the number of sessions per capita.

Resource maximization through planning

Over the next ten years, Brandeis expects to invest an additional \$38 million in books and other information resources. The University's \$15 million investment in technological resources over the past seven years has also been significant. These investments include books, serials, other print materials, various digital resources, the Administrative Information Systems Project, a new telephone system, annual improvements to the network infrastructure, and the desktop refresh program. Annual operating costs associated with these initiatives are part of the University's operating budget. The *Integrated Plan* maintains base funding for these initiatives and allocates incremental funds for planned network improvements.

With the standards for most of the administrative systems in place, the University will focus more closely on the Academy's technological needs. The consolidation of Information Technology Services with the University Libraries makes possible greater and more complete support for teaching, learning, and scholarship. Division leadership will develop this year a new library and technology strategic plan that will reduce redundancy and establish a library collections strategy emphasizing content delivery. In anticipation of this plan and recognizing the continuing increase in library and information technology expenses, the FY2006 budget approved by the Board of Trustees included first-year funding of \$200,000 toward a multi-year initiative of \$1 million. This funding has also been included in the FY2007 budget.

Reliability, security, and privacy

A range of policies and procedures ensures the reliability of systems, the integrity and security of data, and the privacy of individuals. In 2000, Brandeis monitored its systems for failure; today, the University monitors baseline performance for capacity planning and is often able to predict errors before they occur. For desktop security there are several programs in place. An internal network security audit, begun in July 2005, has recently been completed, and its recommendations are being implemented. Currently, all faculty and staff computers are configured to run Windows updates automatically. All computers on the network, including students' computers, must run antivirus software routinely or risk being disconnected from the network. Any computer infected with a virus is immediately denied network access, and the computer software is reinstalled before access is restored. Email at Brandeis undergoes extensive virus checking, spam filtering, and authentication. Strict requirements for passwords and user access rights are enforced. Backup procedures for data are followed each night, and tapes are stored in a secure area separate from the server, both on-site and off-site.

In order to ensure compliance with maintenance agreements, key software is updated on a routine basis. LTS installs PeopleSoft patches on a quarterly basis and completes one significant upgrade each year. All government-required updates for taxes, financial aid, and other types of reporting are installed in a timely manner (typically quarterly). Brandeis staff members attend user meetings, are expected to stay current with industry trends, and monitor systems routinely.

Brandeis abides by the Generally Accepted Information Security Principles established by the Information Systems Security Association. These principles set out a means to unify information security efforts and to measure their success. The University also regularly follows recommendations from CERT, located at Carnegie Mellon's Software Engineering Institute, which provides alerts regarding potential security threats, vulnerabilities, and current issues experienced nationally. Both the LTS website and periodic messages from the CIO emphasize the importance of cooperation in the prevention of computer crime and invasion.

FERPA settings within the student records system control access to student information, and students are invited to use self-service to update their FERPA settings for directory information. These settings dictate which data are released into any other campus system or directory. Careful coordination of reporting through the Registrar's Office has ensured that FERPA settings are used appropriately. In addition, the student orientation program informs students of the legal ramifications of downloading music and images, warns them about potential misuse of social security numbers, and shares strategies about how to protect their computers from viruses and spy ware. New and returning students must register into the network each semester and go through a process of "cleaning" their computers.

Projection

Ongoing investments in technology infrastructure, especially in support of routine activities, such as refresh cycles, are critical for serving the community. Reliance on the computing infrastructure will only increase, raising expectations for access to resources and services.

LTS is also determining how extensively to invest in its facilities. A noted architectural firm, Shepley Bulfinch Richardson and Abbott, is developing a master library plan that will provide a full assessment of the building envelope and mechanicals. This plan will also offer suggestions for programming, including identification of additional shelving space for books.

New projects will be dictated by the need to replace or upgrade vital services (new phone system; campus network upgrade) or by demands for new services (digital information resources). New services are requested every day, and increased user expectations pressure service delivery. Users seek help when and where they need it. New expectations and requests for assistance led LTS to initiate 24/7 online professional reference services, self-service online document delivery services, desktop delivery of interlibrary loan materials, and podcasting for classes. In administrative systems, the implementation of PeopleSoft led users to become more sophisticated and required the installation of additional system components to meet user demands, including online registration and address changes for students. Because the day-to-day service activities of LTS take more than half of the available staff time, new projects and services require staff to re-focus priorities. Even as LTS strives to meet new expectations, each functional area within the LTS division will require dedicated staff resources for supporting ongoing instruction, research, Web technology, information systems, information resources, network security, and computing infrastructure activities.

The new, more complex world of research, learning, and teaching requires a staff with a new orientation and new skills. Upcoming changes to course management software will include expansion of assessment tools, such as course and curricular rubrics. Students will be able to develop personal or professional e-portfolios. They will be able to review their progress within courses on an individual basis or compare their progress to peers within the course. These developments will require significant input and effort from the faculty, careful coordination with administrators and administrative systems, and increased

support from LTS staff. Increasing emphasis on information literacy skills will require staff to partner with faculty to create effective learning opportunities throughout the undergraduate curriculum. Skills in instructional design will be required to inform the use of technology in teaching and learning. LTS has been fortunate in the commitment and range of talents of its staff, but staff development will require ongoing attention.

Of all the areas within a university, information resources and information technology are probably the most dynamic and unpredictable. Brandeis does not know what the future will bring in this area, but it is confident that it has the vision, flexibility, and management skills to pursue the right course for the University.

Institutional Effectiveness

The importance of assessment will continue to grow and inform services. Past assessment activities have included LibQUAL+, a survey that measures the quality of library services; the Survey of Students and Information Technology conducted by the EDUCAUSE Center for Applied Research; and MISO, a quantitative survey designed to measure the use and effectiveness of the services and resources of merged library and computing units. These assessment activities have occurred occasionally over the past ten years, and will occur regularly in the future. The data gathered during these activities will inform the ongoing process of enhancing library and technology services.