Transforming Georgetown Through Technology

Cooperation and collaboration helped Georgetown University move from catching up to leading in information technology initiatives

By **Rachel Blitzblau** and **Mary Hanson**

Located in the heart of the nation's capital, Georgetown University has developed a long tradition of creating international connections and hosting international students. Today Georgetown includes three professional and graduate schools (Medicine, Law, and the Graduate School), and five undergraduate schools (the College of Arts and Sciences, and the Schools of Nursing, Business, Foreign Service, and Languages and Linguistics). The law school and medical school are among the largest and oldest in the nation. Entering its third century of existence, the Jesuit university had become a world-recognized institution in the humanities and medicine — but not at the forefront of technology. Today, after a concentrated period of universitywide cooperation and collaboration, the information technology environment is world-class.

"When I came to Georgetown in 1995, only 40 percent of faculty on the main campus had Internet connections," explained Ardoth Hassler, Associate Vice President for University Information Services (UIS). The university lacked IT infrastructure at that point, although it had five chief information officer (CIO) positions. Each campus had its own IT leadership, systems, and initiatives, as did central administration. Hassler held the main campus post. Two reports (in 1992 and 1995) by committees composed of faculty members addressed technical issues, yet by late 1996 it became clear that Georgetown needed a different system to keep up in the IT world.

An external review performed in 1997 recommended that the university consolidate its IT initiatives with a leadership layer that included a vice president and CIO. A cross-university task force then determined what Georgetown wanted from a senior leader, and the search began for the university's first cabinet-level CIO. In early 1998 H. David Lambert came to Georgetown from Cornell as the new Vice President for Information Services (VPIS) and CIO.

Building an IT Administration

After coming to Georgetown, Lambert appointed Hassler associate VP and began the process of creating a consolidated administration. As VP and CIO, Lambert reports to the senior VP and the university provost, as well as to the senior academic leadership of the medical school. The CIO also oversees both the Office of Information Services (OIS) and UIS. The OIS focuses on strategic and financial planning and policy areas of IT, while the UIS carries out daily technical operations and develops and supports the IT infrastructure. Some members of the OIS are also affiliates of the UIS.

To build the management structure of UIS, the university drew heavily on existing staff. This has held particularly true for the discipline-specific support staff — staff members who have advanced degrees in a discipline as well as technological training. Several recent M.A. and Ph.D. graduates were hired into these positions. Additional staff members were recruited from the corporate sector in order to tap into some of the strategies used in business IT management.

Technology advisory committees include Georgetown University information delivered electronically (GUide), Computing Services Advisory Committee, Technology Oversight Committee, and Information Systems Strategic Planning and Priorities Committee. Faculty members, IT staff, library staff, central administration staff, and students from all the schools work together in these groups to advise UIS, plan future initiatives, and evaluate current programs in light of user and university needs. The university is currently working with rolling five-year strategic plans for technology development.

Policy decisions have also come under OIS's purview, and that of Hassler in particular. While GU has no dedicated IT policy officer, Hassler has been working with several of the advisory committees to create university policies on Web business and advertising, information access, intellectual property, and data administration.

Outside of UIS, the Computer Science Department has doubled the number of full-time faculty under the leadership of Mahendran Velau-

thappillai. The most recently hired faculty member, Bala Kalyanasundaram, said he chose Georgetown over another school or industry because of the school's strong commitment to technology. The faculty in the computer science department focus on keeping the course topics current (they added a class on wireless technology this year with technical support provided by UIS) and contributing to the efforts of IT development on campus.

Financing IT Re-engineering

Funding IT initiatives is a challenge many universities face, particularly when such a large restructuring process is underway. At Georgetown, Lambert estimates the university has already invested $25 million in IT infrastructure since his arrival in 1998, in addition to pledging $47 million more over the next five years. Additionally, UIS's yearly operating budget has increased by about $3.5 million and currently stands at around $14 million.

The development of the online alumni network Hoyasonline, by UIS and the Alumni Relations Office, has helped boost the university's capital campaign. Hoyasonline, which received the EDUCAUSE Award for Exemplary Practices in Information Technology Solutions at the EDU-CAUSE 2000 annual conference, already has 30,000 registered users. As part of the unique NetID system, alumni now keep their IDs and e-mail forwarding for life. Many alumni have written to express their appreciation of the new technology at GU.

Building Infrastructure

After joining GU, Hassler initiated the process of physically wiring academic buildings, with the first priority to get all faculty members online. Soon after Lambert joined the university, the wiring process (including residence halls) was completed. Under the leadership of Richard Kogut, Chief IT Architect, and Christopher Peabody, Director of Networking, the university chose to use fiber optics to increase bandwidth capabilities and maintain flexibility for the future.

President Leo J. O'Donovan

President Leo J. O'Donovan received his undergraduate degree from Georgetown University in 1956. In 1989 he returned to the university to serve as the 47th president. Father O'Donovan made the following comments* regarding technology at Georgetown University:

"The future thus poses a set of profound challenges and opportunities for Georgetown. First and most immediately, there is the challenge to stay competitive as an institution of excellence by integrating into the university the best possible infrastructure, hardware, software, and applications of new technologies. We have the responsibility to create and maintain an environment that is just as committed to excellence in technology as we are to a first-rate faculty and the best possible learning resources and facilities. Without such a commitment we will not be competitive as an institution, nor will our students be competitive and well prepared for their professional lives."

In a later speech** he said, "As we expand the way we communicate and gain knowledge, information technology will surely help us advance and grow closer as a global community. But that promise is not solely a technological matter. And as we advance our resources at Georgetown, we will not forget that education, as Arthur Schlesinger recently noted, 'must establish a moral and intellectual framework that will teach new generations how to use ... potent new technologies with prudence and wisdom.'"

* Address for the Faculty Fall 1996 Convocation, "Another New World: Shaping Information Technology to a Jesuit University in the Liberal Arts Tradition"
** 1998 Faculty Convocation Address

Another early initiative replaced the server system. GU had been using LAN-based server systems, with many separate servers around campus. They now use a centralized server structure, with migration away from the old systems almost complete. The Law Center has its own server tree because of its distance from the main campus, but that has also been updated.

Looming Y2K problems within the administrative systems also required immediate attention. The financials and student admissions systems had to be replaced immediately. The challenge was to find a cost-effective and responsive model useful to multiple end users that would provide long-term flexibility. The university contracted with PeopleSoft, coming in on budget and close to on time with the implementation. As a result, financials for all schools and admissions for the

main campus are now completely online, as are many student services, such as registration. The medical campus is moving toward an online admissions process in collaboration with the American Medical College Admissions System (AMCAS).

The PeopleSoft project was one of the first examples of the new level of collaboration and was directly responsible for a change in the business process at GU. "For the first time at Georgetown, we had the business owners for all these systems sitting down and talking about decisions we make for the university, not just their area," said Kevin Murphy, Managing Director of UIS Operations. Assessing the needs of other administrative groups will permit implementing similar reorganizations, with planning based on needs rather than a specific application.

Figure 1

Public E-Mail Terminals in the Intercultural Center at GU

Courtesy of Kelly Flowers, OIS, Georgetown University

One of the largest infrastructure projects, the Data Warehouse — under development by the Information Systems department — involves creating an interface between the Web and data and business cores. The project aims to produce a system where changes within the core don't change the Web-based front page and an infrastructure that permits multiple applications. In this spirit, the IS department hopes that users from any area of the university can eventually use tools provided by the staff to create their own "data marts." Following pilot stages, the first subject areas are now ready to go online.

Georgetown made it a priority to develop open, Web-based systems designed to fit the needs of the many and varied users. As part of the new open-standard system, GU has moved almost completely to a network system that uses a unique NetID and a single password. Authentication and authorization are directory driven using LDAP and the NetID. Financials, student services, the new IMAP GUmail system, and Hoyasonline all employ this new system. The business rules necessary to apply this system to all applications haven't been fully established, so in some cases users still have multiple passwords. To increase security, Georgetown plans to enhance LDAP with Kerberos, a network authentication protocol designed at Massachusetts Institute of Technology for client-server applications.

GU has developed strategic partnerships with Dell and Apple to provide desktop computers, and funds them through a leasing program. The desktop systems are now updated in all the public labs (see Figure 1), as well as for all faculty members and most staff on the main campus. The medical school is moving to standard systems as well. In the process, the university aims to ensure functionality and stability. Faculty and staff systems have been standardized, and both the desktop and server systems are on three-year replacement schedules.

Integrating Pedagogy and Technology

Georgetown has a strong tradition of pedagogy and is actively involved in integrating technology into teaching and learning. In one of the most collaborative efforts on campus, the university has created the Center for New Designs in Learning and Scholarship (CNDLS). CNDLS has three tasks developed around the core idea of "reflective practice": to provide a general center for teaching and learning, to set up a coherent support interface for technology, and to serve as an institute for advanced study of teaching and learning.

The idea of advanced study includes being aware of what's going on outside GU, and CNDLS founder Randy Bass has worked with hundreds of faculty from around the country. CNDLS participates in a five-year scholarship and teaching project involving 60 faculty on 24 campuses called the Visible Knowledge Project, one of the largest technology and learning projects in the humanities in the U.S. The center seeks new collaborations as well and has begun to think about teaching applications for Internet2. Recently, CNDLS has been charged with continuing the Jesuit mission of values and social service in pedagogy on behalf of the university.

One of the main challenges for CNDLS has been to balance technology and pedagogy. Explained Bass,

We can't possibly know much about the impact of technology on learning because we know almost nothing about the impact of teaching on learning. If we're going to be developing technology in the context of curriculum, then that has to be going on at the same time that we're professionally engaged in a very deep and extensive exploration of what it means when we teach and how it is that students learn.

In order to do this, CNDLS developed the Faculty Colloquium on New Learning Environments, a one-year cycle in which all faculty members are invited to participate. The first part of the cycle occurs during the spring semester. During this phase the faculty members meet several times to discuss pedagogy and to think about what they want to achieve in the classroom. The next phase is the Summer Institute, a one-week development-oriented program. During the Summer Institute participants encounter the technology they'll use and work with CNDLS staff to redesign a small part of their courses. The final phase occurs in the fall, when the faculty members meet with staff to evaluate the changes and write a reflection of what they've learned.

The CNDLS program integrates staff from UIS, the Lauinger Library on the main campus, and CNDLS itself. "Both at the highest level, and at the level where the work gets done, there are people at the library and UIS involved in CNDLS, which tightens the collabo-

ration," said Michael Neuman, director of the Research, Curriculum, and Development Group. "We need all of these groups working together to actually be successful," continued Eric Hoffman, CNDLS program coordinator. They see their job as knowing the right person in any of the three groups to whom they should refer a faculty member in order to best meet the specific teaching need.

At an infrastructure level, all classrooms on the main campus have a live network connection, and most have equipment for digital presentations. The current goal is to have 70 percent of the rooms include an e-podium, with a built-in computer and integrated audio, visual, and projection. The medical school also plans to use e-podiums.

One newly built classroom has 28 desktop workstations, each accommodating two students. Plans for a humanities classroom include group set-ups for four to five students per station, to be housed in a new technology center. The Art Department features a state-of-the-art digital lab with high-end imaging and software technology (see Figure 2). The money for the digital lab came from donations.

Faculty members on the main campus and at the medical school are also putting course content online. On the main campus Georgetown was a beta test site for level three of Blackboard version five. Every faculty member scheduled to teach is automatically set up with a Blackboard course, and the students registered for that course are entered into the system. Blackboard provides a set of templates the teacher can use to post readings, lecture notes, audio and video clips, or run an online chat room. Faculty use of the system remains quite variable, but many use at least some aspect of it.

The medical campus demonstrates a similar trend. The director of the Dahlgren Library and dean of knowledge management, Jane Blumenthal, oversees the central Web-based learning system on the medical campus. One course was entirely online last year, and many other courses are partly online. Almost all slides are digitized and on the Web.

The medical library has several software packages used both in classes and for supplemental resources. The number of online journals available at GU exceeds 400, and the university has just contracted for more. The medical school is currently assessing whether to require laptops and how to start incorporating personal digital assistants (PDAs) into the curriculum.

Campuswide Advanced Technology Initiatives

In addition to updating the university infrastructure, Georgetown actively pursues many advanced technological applications, in both user-driven and universitywide initiatives. The latter include plans to develop wireless and voice-over-Internet protocol (VoIP) systems. Currently, members of the Computer Science Department are testing wireless systems, as the university considers security and bandwidth issues associated with the new technology. VoIP is also in the testing phase, not yet ready for full-scale use.

Many of the user-driven research initiatives fall under the supervision of Steve Moore, the director of Advanced Research Computing (ARC). "We are actively working with the scientific community to port their research and applications to Internet2, and to use the PACI grid," said Moore. The PACI Grid, named after the National Partnership for Advanced Computational Infrastructure (NPACI), will serve as a portal for access to high-end technology contributed by member institutions around the country.

As an early member of Internet2, Georgetown gave one of the first humanities-based demonstrations of the new system's capabilities with a poem performed in American Sign Language. Michael Gettes, Principal Technolgist, is actively involved in the Internet2 Middleware initiative working on the directory of directories and the edu-person concepts. Other academic areas also reflect GU's commitment to the project. For instance, ARC is helping the Chronic Pain and Fatigue Research Center develop virtual therapy that involves teleconferencing on Internet2. An injury-model device developed by ARC and members of the neuroscience department led to publication of novel data, now drawing interest from researchers in Germany and Australia who do similar work.

Additionally, ARC is creating a stable Beowolf cluster for members of

Figure 2

A Student Using a 22-inch LCD Apple Cinema Display in the New Napolitano Digital Art Studio

Phil Humnicky/Georgetown University

the Physics, Chemistry, Neuroscience, and Neurology Departments. This system consists of a cluster of interconnected Linux central processing units, providing supercomputing power without the cost. UIS and ARC will support the cluster.

It's clear from these examples that ARC provides assistance in a wide range of disciplines — made possible by UIS support staff who serve multiple departments, but are specialized to help the scientific and medical community. Whereas previously each research department had to hire its own tech support, they now contribute financially toward the members of the more centrally managed UIS staff. Moore attributes the success to cooperation amongst the departments: "As people buy into the idea of collaboration, you can eliminate some redundancy."

User Support

A crucial aspect of such rapid and large-scale redesign of IT is to have strong user support. In addition to CNDLS and ARC, support comes from the Academic and Information Technology Services (AITS) group under the leadership of Beth Ann Bergsmark: "[We] assist people to make the best use of the technology. To ensure that everything that's surrounding the desktop — as well as the access to any core or local applications — is unfettered."

AITS encompasses two basic service arms: one for faculty and staff, and another for students. The faculty and staff support group consists of a help desk within UIS, plus volunteer departmental technology representatives (DTRs). Ten full-time AITS employees staff the help desk. The DTRs are generally business management or administrative members of their department. They attend bimonthly meetings with AITS staff and help with initiatives like software distribution. During large-scale migrations, such as the switch to GUmail, the DTRs can disseminate information to their departments and provide local assis-

tance. DTRs with adequate training have access to the trouble-tracking system that AITS uses to triage problems.

Student support falls under Student Technology Services (STS). Undergraduate students largely staff STS. These students work in the dorms to help other students connect with the network; they staff the student help desk in UIS; and teams of these students go into the labs to help maintain the approximately 200 public workstations (30 percent Macintosh, 70 percent PC). Since students don't have the same access and privileges as faculty and staff, their needs differ. The full-time AITS staff and the student staff can therefore complement each other in providing support to all users.

AITS is the primary branch of UIS involved in rolling out new IT initiatives to users. Clear and consistent communication is key to this process. AITS communicates with users through DTRs, a newsletter, broadcast e-mails, and its Web page. Documentation online helps users solve their own problems. AITS is moving toward greater automation to reduce the need to speak to a person to solve every problem. Additionally, developing ways to do push–pull software means each system doesn't have to be upgraded individually.

In the last year AITS has begun to provide support to the medical campus. A team of support staff now works out of Dahlgren Library.

These staff members provide support for the unique needs of users from the scientific and medical community. AITS also provides some faculty and staff services for the law center and works with the law library to support student users.

Looking to the Future

Designing future initiatives requires evaluation of accomplishments to date, especially since the newly developed CIO office and UIS seek convergence of IT ideas at Georgetown. "We're three years into the consolidation process, and I think we're at a level of IT that is consistent with peer universities," said CIO Lambert. However, GU has no plans to rest on its accomplishments. In reference to planning for the future, Hassler noted, "This is a change for Georgetown because we are now trying to get ahead of the curve." They believe that collaboration and cooperation have moved Georgetown from the position of catching up to that of moving ahead in IT. As Blumenthal said, "You put people together, and they come up with even bigger and better dreams and ideas than they had on their own. Now we have that synergy of more ideas." *e*

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For More Information

IT Administration: http://www.georgetown.edu/technology/cio/

Technology Initiatives: http://www.georgetown.edu/technology/initiatives/

Advisory Committees: http://www.georgetown.edu/technology/advisorygroups/

CNDLS: http://www.georgetown.edu/main/provost/candles/

Online Help: http://www.georgetown.edu/uis/onlinehelp/

Student Technology Services: http://www.georgetown.edu/uis/onlinehelp/

Law School IST: http://www.law.georgetown.edu/ist/

PACI Grid: http://hotpage.paci.org/