

## Vice President for Information Services and Technology

MIT's vice president for information services and technology, Dr. Jerrold M. Grochow, focuses on providing information technology (IT) services to the MIT community. This role includes leading the central Information Services and Technology Department (IS&T); representing IS/IT to the Academic Council; advising senior management on IS/IT issues; leading the Institute-wide IS/IT advisory structure, named the Information Technology Strategic Planning and Resources Coordinating Council (IT-SPARCC); fostering collaboration among the many groups on campus that provide computer facilities and support; developing capital spending plans for IS/IT; and innovating, experimenting, and advancing the use of computer and communication technology.

IS&T's success relies on its ability to support MIT's core mission—to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century—by building strong working partnerships with the Institute's faculty, students, and staff to maximize the value of information technology in their work.

### Highlights

Four key areas stand out for FY2006:

- SAP Human Resources/Payroll implementation
- Brain and cognitive sciences building project
- Completion of wireless campus
- Major organizational changes: formation of Student and Administrative Information Systems (SAIS) and Infrastructure Software Development and Architecture (ISDA) and the hiring of two new directors

### SAP HR/Payroll Implementation

This large multi-phased project, which began in January 2001, culminated in the implementation of a new SAP-based employee and student payroll system, scheduled for July 1, 2006. This system serves approximately 14,000 exempt and non-exempt employees on both the MIT campus and Lincoln Laboratory, providing them with new electronic tools for payroll functions formerly done via paper processes. The new features include web-based time entry and approval, employee self-service functions for direct deposit and withholding, and applications for salary distribution. This project required continuous community input and collaboration with administrative and academic departmental liaisons. Activities within IS&T spanned all functions from design and programming to education and training. These included the development and delivery of extensive community communications, training, and documentation for the Payroll and Human Resources staff, as well as the community at large; collaboration between the Computing Help Desk staff and the Payroll Service Center to prepare for a variety of urgent questions typically associated with a payroll implementation; working with staff in most MIT departments to identify and enter approximately 7,000

departmental payroll authorizations; and adding temporary staff in several areas (such as the departmental IT Resources group) to handle on-site technical problems for members of the MIT Community.

### **Brain and Cognitive Sciences Building Project**

In September 2005, faculty and staff from MIT's Brain and Cognitive Sciences Department, along with researchers from the McGovern Institute for Brain Research and the Picower Institute for Learning and Memory, moved into the magnificent eight-story, 411,000-square-foot brain and cognitive sciences building. To facilitate collaboration among the tenants on IT issues, IS&T assigned a relationship manager to the project and assisted in the creation of an IT user steering committee with representatives from all three tenants of the building. Working with the Brain and Cognitive Sciences department head, the steering committee's first meeting included two Nobel prize winners. Although the primary focus was on the network and infrastructure groups responsible for designing a complex of networks using 350 miles of wiring, 150 wireless access points, and 120 high-speed switches, IT work required participation from most departments in the central IT organization. IS&T teams worked closely with faculty and research staff to understand their needs for general and research computing, and to make them aware of the kinds of newer network technologies that could serve them. We installed our first virtual local area network (VLAN) on top of the physical infrastructure so that each network connection could be routed either to the general MIT network or to one of several separate research networks. Given the sensitivity of the experiments being performed, it was particularly important to ensure that research networks were totally independent of the general campus network, and we were able to demonstrate that the VLAN approach was both effective and efficient. Local research staff were given access to reconfigure the network connections without central IT support, a major breakthrough in customer control. Visitors to the brain and cognitive sciences center have wireless access throughout the building and laboratories, and the classrooms can be used separately or together for overflow crowds. This project was a true collaborative effort—an example of providing IT service at its best.

### **Wireless Campus**

In May 2004, IS&T began a program to increase the coverage and connection speed of the campus wireless network. By October 2005, MIT had completed this multi-year rollout of high speed wireless connectivity utilizing access points supporting the 802.11a, 802.11b and 802.11g wireless protocol standards, offering speeds ranging from 11 Mb/s to 54 Mb/s. The completion of this project represents one of the largest wireless rollouts in the country with a deployment of over 3,000 access points across a campus covering approximately 10 million square feet.

With the addition of campus-wide wireless capability, and with most students and many staff carrying laptop computers, we are seeing a revolutionary change in the way people work. IS&T partnered with researchers in the Department of Urban Studies and Planning to analyze changing computer usage. iSpots provides a series of maps that aim to visualize these changes by monitoring traffic on the wireless network, showing how people move around campus and providing quantitative evidence that people on the campus really are using wireless fidelity (WiFi) nearly 24 hours a day. The MIT Museum

also took interest in this project and hosted an exhibit in November 2005 around the MIT wireless network and the iSpots technology.

## Organizational Changes

### Student and Administrative Information Systems

On July 1, 2005, Student Services Information Technology (SSIT) joined forces with IS&T's Administrative Computing Department. The combined group, called Student and Administrative Information Systems (SAIS), sustains, improves, and develops business applications that support the needs of MIT's students, faculty, employees, and community, while staying current with the growth and expansion of technologies and ensuring that all applications meet or exceed client requirements and expectations. It has responsibility for MIT's student information systems and for other administrative systems, including those implemented using the SAP software suite.

After an extensive national search, Christine Meholic, formerly working for the Commonwealth of Pennsylvania, was named director of SAIS in May 2006.

### Infrastructure Software Development and Architecture

In February 2005, IS&T, working with an outside organizational consultant, conducted a study of our infrastructure software activities, which at that time were dispersed across several IS&T groups. The findings of this study resulted in a decision to create a new Infrastructure Software Development and Architecture Group (ISDA) to develop, maintain, and promote a flexible infrastructure software architecture populated by components and with interfaces that are easily usable (and used) by software developers across MIT.

In March 2006, after an extensive national search, Wilson D'Souza, formerly working for Merrill Lynch & Co., was named director of ISDA.

## Summary of Financials for FY2006

Below are a few highlights in summary of the FY2006 IS&T finances.

- IS&T gross expenses for FY2006 totaled \$58.4M. This is approximately 40 percent of the total IT expenditures at MIT, with the remainder being funded in departments, labs, and centers (DLCs) for a variety of purposes. Approximately 35 percent of IS&T activity is funded from services re-billed to departments using telephone and network services and other rate-recovered services, such as desktop support, software distribution, and server management.
- Spending in FY 2006 was distributed as follows:
  - 40% for ongoing operational support and service
  - 40% for maintenance and enhancements that retain current functionality
  - 20% for new products and services, as well as upgrades that introduce new functionality

- Approximately half of the new products and services spending in FY2006 were for the completion of the HR/Payroll Implementation project. IS&T spending this year for the project was \$5.9M, bringing the total project expense to date to \$25.5M including funding from the Controllers Accounting Office and HR. The original budget projection for this project was \$25M, which is remarkably accurate for a project of this magnitude.
- Investment in capital assets and infrastructure upgrades for the Telephone and Network Service Center (TNSC) in FY2006 totaled \$9M, with this number now including funding for all network upgrades and the renovation of telephone and data communications rooms (TDCRs), previously funded through the Center for Research in Security Prices.
- At the close of FY2006, IS&T had 328 full-time employee positions, of which 301 were filled and 27 were open. In a study of IT spending across MIT, findings show another 300–400 IT positions being funded by DLCs.

### **The IS&T Organization, Strategic Themes, and Accomplishments**

The IS&T organization comprises six major groups:

- Academic Computing—Dr. M. S. Vijay Kumar, director
- Client Support Services—Greg Anderson, director (resigned June 15, 2006)
- Infrastructure Software Development and Architecture—Wilson d'Souza, director
- Operations and Infrastructure Services—Theresa M. Regan, director
- Student and Administrative Information Systems—Christine Meholic, director
- Telephony Services and IS&T Shared Services—Allison F. Dolan, director

These functional areas are supported by the IS&T VP's Office, which includes communications, relationship management, project management, finance, and space management.

IS&T's work focuses through the lens of several strategic themes:

- Service orientation—understanding the goals and missions of the people and organizations at MIT to foster a collaborative environment for solving problems and planning for future information technology needs
- Technological innovation and leadership—generating the ideas and experiments that will lead to the next generation of IT services
- Excellence in project execution and management—on schedule, on budget, delivery of hardware and software systems that meet or exceed client expectations
- Collaboration—working with other IT departments on campus, computer users throughout MIT, as well as colleagues on other campuses to ensure that IS&T is providing the highest and most cost effective information services support and technology available

- A high degree of fiscal responsibility coupled with sound financial management
- Personnel development—giving each member of the IS&T community the opportunity to contribute to the full extent of his or her capabilities

Below are examples of our strategic themes although most IS&T activities impact several of these themes.

### **Service Orientation**

In FY2006, IS&T:

- Created the Departmental Consulting and Application Development team, based on the results of a cross-Institute study team. This expanded the suite of services of the current Web Communications Services team to include departmental contracts for database development, as well as website and web application development.
- Increased the default e-mail quota for all MIT users from 256MB to 512MB in order to meet the increasing storage requirements for today's email communications and applications.
- Expanded the focus of IT Security toward behavioral-based analysis—a focus on addressing incidents resulting from the misuse of computing resources, both accidental and intentional. As part of this approach, an outreach program is being developed to help educate the community in the proper management of sensitive data and other risky online behavior.
- Implemented Request Tracker, a new and more robust service for tracking customer questions and requests, replacing our outdated Casetracker system. By the end of the fiscal year, all IS&T service groups, as well as many customer groups had migrated to this new system, enhancing the ability to quickly find customer data and address issues in a more timely fashion.
- Replaced the Broad Institute's Oracle Process Manufacturing with a fully integrated SAP supply chain solution (inventory management, production planning, procurement, quality management and financials) to support their goal to be the lowest cost provider of genomic sequencing data.
- Implemented the final phase of the Environmental Health & Safety SAP solution to address, track, and monitor training requirements, integrating MIT's custom training needs assessment database with SAP's principal investigators space registration. This was one of the final stages of compliance, and we passed the audit with flying colors.
- Worked with members of the faculty to increase usage of Stellar as a course management system by 25 percent, from approximately 400 course sites in spring 2005 to 500 course sites in spring 2006. This growth was accompanied by related increases in the number of faculty members and other instructors using the system. The cumulative count of websites created since 2001 reached 2,724 in spring 2006.
- Increased creation of math course materials for faculty along with a significant increase in training: training registered high levels of attendance, particularly

- during IAP with courses; increased use of visualization by faculty and support in the creation of course material; and development of a mathematics portal for faculty to use math software or symbolic representation on the web. The portal allows faculty to locate and learn about applications and support for technology used in subjects with a mathematics component.
- Improved geodata repository tool to allow for spatial searches on Geographical Information Systems data sets. Users can now do searches on national and international data sets on elevations, transportation, hydrology, building outlines, demographics, and more. Growth in this area continued in partnership with the MIT Libraries.
  - Completed the Inside MIT portal prototype and pilot, with an Oracle application server portal chosen as the platform. The prototype provides a common look and feel and managed set of technologies for enterprise web-applications. The pilot group focused on existing users of SAP Web (mainly administrative officers and support staff).
  - Launched the cable industry's first local origination high definition television (HDTV) channels with 100 percent content produced by MIT's Sportcast Student Group and upgraded MIT cable facilities to provide 20 HDTV/digital television channels from Boston television stations.
  - Supported over 95 applications of third-party software – Athena software launches of monitored software totaled 426,511, and Matlab-Athena and Matlab Student launches were fairly evenly split at around 170,000 each. The number of concurrent licenses for the Student MatLab server was tripled to meet the demand for use on student-owned laptops.
  - Engaged in multiple efforts to bring new ideas and research in educational technology to the wider MIT community through a series of events, including the CrossTalk Seminar Series, meetings of the Ed Tech Partners group, and the online newsletter the Ed Tech Times.
  - Worked on major building construction projects with the Department of Facilities, the Broad Institute, and MIT Police to ensure network and telephone facilities were installed and working in over 500 square feet of MIT buildings.
  - Engaged, at different levels, with the five MIT schools, libraries, OpenCourseWare, dean for student life, and MIT Medical on a variety of IT-related initiatives, service requests, and major building projects such as the brain and cognitive sciences complex, Broad Institute, physics, Department of Materials Science and Engineering, spectroscopy, infrastructure, and Sloan. Our relationship management team also developed client technology usage profiles to better understand how clients use IS&T and other technology services and help inform current and future IS&T service offerings.
  - Received several service awards, notably (1) a distinguished award for the Teaching with Technology website in the Online/User Support Tools category of the 2005 Boston/Northern New England Society for Technical Communications Online Communications Competition, and (2) a service award from the

Association of Independent Living Groups for providing high speed data services to MIT's fraternities, sororities, and independent living groups.

### **Technological Innovation and Leadership**

- Continued with a major campus-wide project to upgrade campus networks— progress in 2006 included upgrading of all remote site office and independent living groups; upgrading of the networks supporting Buildings 5, 13, E51, E52, NW12, and W89; and upgrading the main campus network facility in Building 24. This now means that 40 percent of the office and educational buildings and 30 percent of the residence buildings on campus have wired network capability at 100 Mb/s and above.
- Initiated development and deployment of IS&T Voice Over Internet Protocol (VoIP) telephony services in limited pilots throughout campus, increasing the number of VoIP subscribers on campus to over 500 users. This system utilizes a variety of devices, including desktop phones, wireless phones, and software phones. The pilot has provided IS&T the opportunity to work collaboratively with our customers and build upon their experiences to develop MIT's communications platform of tomorrow.
- Evaluated various real-time collaboration and communications technologies in Phase 2 of the Integrated Communications Project. Deployed several services including a voice response interface for the Shuttletrack system and a wiki to support Cambridge–MIT Exchange students. During the year, the Institute's real-time, internet-based communications infrastructure was expanded and hardened and is currently supporting an expanding VoIP trial in addition to research activities in various labs. Ongoing discussions with the Media Lab, the Computer Science and Artificial Intelligence Laboratory, and others led to a vision of a future, larger initiative that would use the extended campus and community as a test bed for future communications and mobility services.
- Piloted the use of blogs and wikis as social computing tools in the curriculum to assist students with collaborative projects, peer learning, advising, and self-reflection.
- Began the Student Information Systems (SIS) Technology Migration project to migrate legacy systems to a stable platform to build on for the future, including supported versions of hardware and software. The project engages a large portion of SSIT staff, as well as many functional users of SIS. SSIT worked closely with client partners in preparing test cases for migrated source code.
- Upgraded the storage area network (SAN) providing data storage for MIT's key administrative applications from Hewlett-Packard's Enterprise Virtual Array and the European Space Agency technology to EMC's DMX and Clarion technology. This network provided a significant technology refresh for the administrative server infrastructure and provided a platform for the addition of high availability and redundancy features to key administrative platforms. The SAN's next generation technology will also provide new opportunities for approaching the conventional problems of backup and recovery as the volumes of data continue

to expand with the requirements of tomorrow's administrative applications platforms.

- Began email migration effort to help users of Eudora move to Outlook Express, Outlook 2003, or Apple Mail. IS&T offered overview sessions, walk-in clinics, and Quick Start classes. This effort continues, with on-site assistance also available from Departmental Information Technology Resources for users undergoing the conversion process, until Eudora is formally retired in December 2006. The Eudora conversion has been a large, complicated effort requiring a great deal of individualized attention for many customers.
- Launched, in March 2006, the first-ever application at MIT to display Undergraduate Admissions (UA) decisions online, receiving 11,474 hits within its first 48 hours of operation. This highly successful development effort supported UA's desire to respond to increasing applicant expectations to view admissions decisions online. Prior to this, all admissions decisions had been relayed by letter.
- Initiated project to rewrite and migrate UA systems from an IBM mainframe to a supported platform. This will continue through FY2007, and the result will be an integrated undergraduate recruitment and admissions system running on supported hardware and software that will allow more flexibility in ongoing support and provide a major step toward the retirement of the IBM mainframe.
- Expanded services to academic departments and research labs for supporting high performance computers (HPC). Worked with IBM and the Laboratory for Nuclear Science (LNS) to install MIT's first IBM Blue Gene, putting MIT on the Top 500 list of high speed research computers. Co-location services, including HPC, expanded by 15 racks of computers for six DLCs: LNS, Computational and Systems Biology, Center for Biological and Computational Learning, Chemical Engineering, Mechanical Engineering, and Civil and Environmental Engineering. The Sloan School, the Media Lab, and the Economics Department also housed administrative computers with IS&T in our growing co-location facility in W91.
- Acquired leases on dark fiber between Boston, New York City, Albany, and Baltimore, providing MIT network connectivity to the key Internet exchange point for research networking in the Northeast. This regional fiber network will provide a foundation for the creation of MIT's regional optical network, which will open up new opportunities in research and collaboration that were previously unavailable.
- Rewrote and expanded the Cultura project for faculty in the Foreign Languages and Literatures section. Cultura is a web-based system that fosters intercultural exchange and language learning, and is now being used both at MIT and six other institutions, with a growing interest from others.
- Finalized an agreement with Sun Microsystems to create a Sun Center of Excellence for Open Interoperability at MIT. This center will provide a laboratory for exploring and testing interoperability between educational services, content, and software products that want to integrate with those services and content, and to promote techniques, specifications, and standards for assuring sustainable integration strategies for eLearning.

- Provided early exposure to students in the use of research computing tools by adapting and extending them into teaching and learning. A protein visualization tool and a gene pattern workflow tool were developed and used in the classroom setting.
- Reached a five-year milestone with the Open Knowledge Initiative (OKI) Summit at MIT in February 2006. For extended eLearning, OKI also reported significant adoption by the publishing industry and medical education sectors.

### **Excellence in Project Execution and Management**

- Developed a portfolio management process for Administrative Systems that addresses the lifecycle from project requests through prioritization, business case analysis, resourcing/scheduling, and implementation.
- Continued to rollout the Project Management Methodology (PMM) across IS&T. PMM has also been adopted outside MIT by a number of other universities and several corporate organizations.

### **Collaboration**

- Began the initial phase of the Student System Vision in collaboration with the dean for undergraduate education and the dean for graduate students. This is a large-scale effort to address the evolving needs of the MIT community and to identify the best ways to provide effective approaches to the businesses associated with admissions, enrollment, student life, and financial services. The project communicated project goals and gained initial community feedback; solicited proposals for external consulting to lead MIT through planning, requirements gathering, and gap analysis phases, and worked to build executive support and sponsorship throughout MIT.
- Launched an initiative in collaboration with Residential Life, in spring 2005, to deliver information technology experiments in MIT's residence halls. The Residential Life Experiments involved laptop support with the provision of displays and keyboards in dorm clusters, digital cable (Sportcast), peripheral proxy service, and collaborative video display space.
- Worked with MIT Medical and others to install phones for defibrillators, resulting in MIT's receiving its first Heartsafe Award.
- Worked with Environmental Health and Safety on MIT's emergency preparedness. Telephony was a key member of the communications team, providing traditional telephones as well as special mobile phones for the emergency-dispensing drill.
- Received funding from the Mellon Foundation to work collaboratively with Tufts Academic Computing to extend the Tufts Virtual Understanding Environment (VUE) application. VUE II is a concept-mapping tool that uses OKI plug-ins to support a variety of MIT digital repositories, including OpenCourseWare,

DSpace, and the Rotch Library's visual collections, as well as external repositories such as the Museum of Fine Arts.

### **Fiscal Responsibility and Financial Management**

- Developed a five-year funding model for all major projects that will be used to analyze the true cost to MIT of major development projects.
- Collaborated on a project with Stanford University to determine the total cost of IT at each campus and the purpose of IT spending, resulting in a cost of IT methodology and an Educause research paper.
- Continued the next phase of a telephone and network service center (TNSC) pricing project to revamp pricing models for network and telephone services to better reflect costs and benefits to individuals and departments, possibly resulting in a new way of pricing for FY2008.
- Improved the billing process for all volume site-licensed software, addressing a customer satisfaction issue. A cornerstone of this effort was the simplification of the MATLAB ordering process, which makes it easier for individuals and groups to select the components they need for the MATLAB software. The term of the license agreement was also shifted to coincide with the fiscal year, and licenses continue to be offered at a greatly reduced price.
- Analyzed the current server operations business, resulting in the development of a service center funding model providing multiple levels of server management services to better address the MIT community's needs in a more cost effective way.

### **Personnel Development**

- Revamped job titles to distinguish between technical and managerial career paths, allowing staff members to focus their professional development along the lines of their greatest interest. Also, completed a job title alignment effort that included the review of current job descriptions and the drafting of new job descriptions that match and align with MIT IT job codes.
- Revitalized IS&T's Rewards and Recognition program, including a new Infinite Mile award—the IS&T Spotlight Awards. Award recipients for 2006 included John Morgante, IT infrastructure project coordinator, Telecommunications and Network Installation Services, Office of Information Services; Margaret Wong, technical consultant/developer, Training/Consulting and Publication Services, Client Support Services and the Kerberos Team, ISDA; Sam Hartman, manager; Alexis Ellwood, programmer analyst; Tom Yu, programmer analyst; Ken Raeburn, senior programmer analyst; Andrew Boardman, senior programmer analyst; and Joe Calzaretta, programmer analyst.
- Sent three IS&T staff members to participate in an IT leadership program with colleagues from the Sloan School of Management and Academic Media Production Services, as well as from other universities.

- Supported the selection of one member of IS&T to participate in MIT's Leader to Leader program.
- Provided additional knowledge about other areas of MIT to IS&T staff by inviting several deans to speak about work in their schools at our IS&T All Hands meetings.
- Invited Professor Gabriel Bitran from the Sloan School of Management to educate the IS&T staff about his work and research in the area of service organizations.

IS&T has always presented itself as a technological leader in the higher education community. IS&T staff participate in, contribute to, and often play key formal and informal leadership roles in various professional and industry organizations, such as Internet2, Educause, the Common Solutions Group, the Northeast Regional Computing Program, College and University Information Security Professionals, the Boston Consortium, the IVY+ groups, the Internet Engineering Task Force security and calendaring standards groups, Syllabus, the Special Interest Group on University and College Computing Services, ACM's Special Interest Group on Design of Communication, the New England Information and Technology Managers Group, IT Financial Management Association, the 5E Private Owners Association, SAP International Higher Education and Research Conference, Human Resources College and University Personnel Administration Conference, and the Association for Telecommunications Professionals in Higher Education, among others. In addition, IS&T staff provide advice on a regular basis to corporations such as Microsoft, Apple, Dell, Sun, Lucent, and Oracle via membership on corporate advisory boards or through ongoing consulting relationships. Staff also collaborate with a wide range of other vendors and outside groups.

IS&T is proud of its achievements over the past year in improving and expanding our services to the MIT community. We are committed to moving forward and continuing to improve in each of these areas in the coming year.

**Jerrold M. Grochow**  
**Vice President for Information Services and Technology**

*More information about Information Services and Technology can be found at <http://web.mit.edu/ist/>.*