Evolution of Data Usage
From Hunters and Gatherers to Farmers to Cooks

At MIT data is widely used as the foundation to provide context, answer questions and plan for the future. Not so long ago data gathering by the user community resembled the activities of hunter-gatherers — requiring local knowledge and a vast amount of time trying to find what was available and how to acquire it. Currently most community members know where data is and how to access it much like farmers with their seeds and harvests. Simplifying, understanding and the access to data and finding much more ways to combine it will bring us to the next level — like cooks and nutritionists.

A 3-pronged data interaction model focused on delivering, acquiring, and using information will help transition from a functional and process-based approach to a person-centric one, from a focus on reports to information delivery, and from canned static reporting to an easy-to-use self-service model. The Data Roadmap approved by the IT Governance Committee sets direction and plans for Data Management.

Delivering Information
Data Management has been working with members of departments, laboratories, and centers (DLCs) to focus on data issues and reporting in the areas of Finance, EHS, and HR. These focus groups are providing input on high priority reports and helping to define data that will make life easier for various administrators within the DLCs. They are defining data and reports, identifying drill-down paths and choices for subscriptions and notifications, and identifying areas where data issues need to be addressed. New reports are being built in COGNOS (the Institute’s new reporting tool.)

Acquiring Information (Managed Data Services)
Managed Data Services provides the community with tools for entering department data and extending enterprise data. This includes tailored solutions for specific needs (examples: Faculty honors & awards, abandoned property and space economy.) A unified architecture for data acquisition from various DLCs and central offices will be the key to achieving increased automation and self-service.

Using Information (Planning/Analysis)
Administrators responsible for researcher accounts at MIT have a plethora of reporting requirements and need to plan, forecast and perform predictive analysis. Enter RAFT (the Reporting and Forecasting Tool), the first tool at MIT focused on enabling forecasting and reporting. Phase I is read only, reporting for actuals, budgets and commitments. Phase II will offer forecasting for expenses and people and enhanced reporting. Phase III will provide the Principal Investigator (PI) view. Phase II is currently being rolled out to the MIT community.

Just as the best chefs need the finest ingredients for cooking, our community needs a pantry stocked with data and tools for delivering, acquiring, and using information!

Enhancing the Student and Faculty Experience
Following the Roadmap Creates Dynamic Student Information Systems at MIT

(Aadapted from a letter to Faculty on December 1, 2011 from Dan Hastings, Dean for Undergraduate Education; Christine Ortiz, Dean for Graduate Education; and Marilyn T. Smith, Head of Information Services and Technology.

A little over a year ago, if you asked faculty, students and staff to describe their experiences with MIT’s Student Information Systems, you would probably hear words like paper-based, outdated, time-consuming, and inflexible. Today, significant progress has been made to modernize these systems and enhance the user experience. If you asked faculty, students, and staff the same question now, you would hear something very different: digitized, online, paperless, robust, efficient, flexible, and streamlined.

Why the difference? The Education Systems Roadmap [pdf] approved by the IT Governance Committee in September 2010, set direction and prioritized nine key areas for improving the user experience and increasing self-service.

Online Grading
Each semester, more than 39,000 grades are submitted. Grade reporting replaces the paper-based submission process with an efficient and flexible web-based application.

In the new online system, grades can be reported 24/7 and are posted every 15 minutes. Defined roles allow many users to enter grades while ensuring all grades are vetted by approved faculty. The system also enforces the Faculty Rules and Regulations on grading, such as limiting each subject’s grading mode as for improving the user experience and enhancing the user experience. If you asked faculty, students, and staff the same question now, you would hear something very different: digitized, online, paperless, robust, efficient, flexible, and streamlined.

Electronic Ordering and Delivery of Transcripts
In the past, students and alumni had to submit paper forms to request paper transcripts and these requests would be processed during business hours. An Online Transcripts system launched in October 2011 allows either paper or electronic transcripts to be ordered 24/7. In many cases, the certified and secure eTranscripts are delivered to the recipient within 30 minutes.

Stellar Next Generation
MIT has been considering options for a more robust Learning Management System (LMS) to replace Stellar. At the direction of the Steering Committee for Learning Management Systems under the MIT Council on Educational Technology, I&T conducted an evaluation of Blackboard in spring 2011. The evaluation highlighted systemic issues coupled with limitations in core functionality and extensibility.

Based on these findings, a Modular Service Framework is being developed as the foundation for learning management at MIT. The Framework will gradually replace Stellar functionality with a set of discrete, flexible web services.

Details can be found in the Blackboard 9.1 Experiment Analysis and Recommendation Report.

Classroom Scheduling
The technology that supports MIT’s classroom scheduling is outdated and needs to be replaced. Staff from the Registrar’s Office and IT&I are near the end of the requirements phase for this new system. This will be followed by a plan for design and implementation.

Digital Forms and Petitions
Digitizing forms and petitions is an ongoing effort to reduce paper and streamline processes across the Institute. To date, over 30 academic forms have been identified and during the next year five forms will be digitized.

Moving Forward
Evolving MIT’s student system will help deliver the kind of experiences that keep students engaged and on track for success, as well as support instructors and advisors.

"We have a huge advantage over most of our peer research institutions across the country. We spend very little time acquiring and cleaning data because we have the Data Warehouse. Our colleagues spend about 50% of their time just getting data, negotiating data, and making sure it is in the right format"

Lynsey Slover
Director of Institutional Research, Office of the Provost

"I've received very positive feedback from advisors. One said to me, with a big grin, that this is the best thing since sliced bread. Sorry I requested printed registration forms as a backup. They’re going into the recycling bin this evening!"

(academic administrator)
Got mobile?
Technologies for Anywhere, Anytime, Any Device

John, a sophomore at MIT, returns to campus after winter break with a new iPhone 4S. He is looking forward to integrating it into his everyday life at MIT, so he downloads the free MIT Mobile App from the App Store. As he begins to explore its options with the new app, he notices modules for Building Services and Libraries. He sees a patch of broken pavement outside the Student Center, and uses the app to take a picture of it and send it to Facilities for repair. He uses the Libraries module to check if any of the books he has put on hold have become available. A book he needs has come in, so he uses the Shuttles module to see when the next Tech Shuttle will arrive, and ten minutes later he is on his way to Barker. While on the shuttle he notices that Online Registration and Stellar have been optimized for the mobile web. He’s pleased that he can authenticate, browse syllabi and register for classes from his phone.

Mobile devices are pervasive across campus. Students arrive on campus with them. Faculty, researchers, and staff have them. The average person has between two and four different devices and expects them to work anywhere and 24 x 7. With the introduction of the Android and iOS operating systems, many users’ primary devices are based on mobile technology. As John’s experience demonstrates, today’s students can use their mobile devices to register online, access their course listings on Stellar, and get information in the libraries and through the MIT apps. 2012 is the first year the students have organized 6.570, the MIT Mobile Application Competition. IS&T proudly sponsored and provided mentors for this event. The administration of the Institute is moving to smart phones to increase their ability and efficiency in performing work-related tasks such as checking email, finding locations, and gaining instant access to information.

The reach of the MIT Mobile Apps is much greater than the campus. Over 34,000 people use the native MIT Mobile apps on a weekly basis, extending well beyond the MIT community. It’s easy to imagine a not too distant future where smartphones are a must have item. With the increased use of mobile devices, IS&T and MIT researchers, and staff have them. The average person has between two and four different devices and expects them to work anywhere and 24 x 7. With the introduction of the Android and iOS operating systems, many users’ primary devices are based on mobile technology. As John’s experience demonstrates, today’s students can use their mobile devices to register online, access their course listings on Stellar, and get information in the libraries and through the MIT apps. 2012 is the first year the students have organized 6.570, the MIT Mobile Application Competition. IS&T proudly sponsored and provided mentors for this event. The administration of the Institute is moving to smart phones to increase their ability and efficiency in performing work-related tasks such as checking email, finding locations, and gaining instant access to information.

To facilitate the increased use of mobile devices, IS&T continues to focus on enhancing and upgrading MIT’s wireless infrastructure and providing in-building cellular coverage across campus. Research shows that more and more is being done on devices we carry with us. This means that as IS&T develops and implements systems, websites, and other solutions, we need to think about how the community will interact with them and do their work.

To learn more about the strategies for mobile at MIT, see the MIT Mobile Platform Roadmap.

A Look Ahead
Increased Self-Service, Digitization and Simplification Not Without Challenges

As we move through the second half of FY2012, we will continue to focus on self-service and increasing mobility. We are excited about the redesign of the IS&T website. The site – set to launch in April – will be the first at MIT to use responsive web design, enabling community members to view and interact with it on the devices of their choice (desktops, laptops, tablets, and smartphones).

Enhancements will continue in the areas of mobile (advanced maps and campus preview weekend mobile interfaces); data (RAFT Phase III – focused on managers and principal investigators); customer service and outreach (focus groups/satisfaction surveys); enterprise systems (digitized hourly student appointments; enterprise learning for EHS and Staff training); and infrastructure (wireless upgrades; secure wireless; voicemail transition).

These advances don’t come without challenges. IS&T and IT departments at our peer universities are being asked to improve their value, be accountable, know the data, provide innovation, and reduce costs. As we add new applications and services, our support needs increase.

The remainder of FY2012 promises to be full of exciting opportunities to work in collaboration with the MIT community.

Keeping IT Up and Running
Evolving Infrastructure, Systems, Services and Support to Create a Sustainable, Safe Computing Environment

Israel Ruiz, our new EVP, recently referred to information technology as the water in our lives – critical to MIT. How long could MIT function without IT services before compromising its ability to educate and do research at today’s levels of excellence?

Keeping IT up and running takes about 70% of IS&T’s resources. This includes continuous improvements in systems and infrastructure, mitigating risk, and providing ongoing support.

Continuous Improvement/Enhancements
Improved IT reliability and the ability to adapt to changing technologies help to deliver optimal support to our business partners. SAP is our administrative system of record with 17,000 individuals accessing it regularly for electronic requests. In the first half of FY2012, IS&T worked with business owners to close 796 support/enhancement requests and reduced by half the time required to complete year-end support pack upgrades.

Virtualization of servers gives MIT flexibility and allows us to adapt our data centers to meet rapidly evolving IT requirements. The network migration and virtualization of the development, test, and production tiers for EHS, Events, SAPweb, and Undergraduate Admissions environments provides additional redundancy/capacity, a modernized operating system platform, and the ability to eliminate six physical servers resulting in reduced cost and compliance with our current best practices.

Email and calendaring are key services used by the MIT community. Enhancements to the campus Email/Calendar environment as part of our Microsoft Exchange infrastructure upgrade from 2007 to 2010 provided critical improvements and new features, including the Outlook Web App interface.

Mitigating Risk
Keeping the MIT community safe and mitigating risk is an ongoing process. We address this through evaluation of network access, physical security for equipment and campus, and retirement of legacy systems.

• Secure Wireless – To mitigate cyber threats/privacy concerns and ensure a level of protection similar to what the community has at home, MIT plans to retire its open wireless networks, MIT and MIT N. and assist users making the move to MIT Secure. (TBD based on community readiness; targeted for summer 2012.)
• Retirements – To minimize risk from spammers, worms and other unauthenticated use of our campus network, MIT will restrict off-campus IP addresses from unauthenticated access to its outgoing email server as of 2/2.
• STOP Tagging – To protect faculty and staff laptops and other portable devices from theft, IS&T has partnered with Campus Police to host regular laptop tagging sessions.
• Physical Security – To improve physical security IS&T worked with the Safety and Emergency Management Office (SEMO), upgraded CCURE (MIT’s security card system) and tested a new wireless lock and proxy card system.

Support
Digitization and mobilization of IT has resulted in increased expectations and needs for support including greater demand for accessibility/availability reviews and consultations, help desk clinics at key times and locations across campus, and enhanced self-service options for help (the knowledgebase) and training (lynda.mit.edu).

Did You Know...

• 5.1 billion people have mobile phone subscriptions, while only 4.2 billion people have toothbrushes.
• Over 50,000 modules of instruction were delivered through lynda.mit.edu (online training) in FY2012.
• Over 80 IS&T staff were recognized by colleagues and customers with spotlight and/or Infinite Mile Awards in the first half of FY2012.
• ~ 40,000 end-user devices (computers, laptops, mobile devices, etc.) connected to the MIT network across ~150 buildings.
• By the end of December 2011, there were 3,400 active users of the MIT Mobile app for Android – this is a 300% increase since the initial release in November 2011.

IT Roadmaps
Information Services and Technology (IS&T) has partnered with customers and key stakeholders to develop roadmaps for Education Systems, Data Management, Mobile Computing, MIT Network Security, and Data Centers. These roadmaps, which were reviewed and approved by the governance committees, enable thoughtful, planned, and collaborative decisions regarding future investments. Visit the IT Governance Committee website to see the current IT Roadmaps.