CIT Accomplishments and Plans

Cornell Information Technologies
Fiscal Years 2009-2010
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Message from the Vice President for Information Technologies Emeritus and the Interim Executive Director for Information Technologies

What a year this has been. Last year when Polley wrote the message for this space, we had little certainty regarding what lay ahead for the world economy, for Cornell University, for IT at Cornell, or for the two of us professionally and personally. The world economy seems to be recovering, many decisions about how Cornell University will recover financially have been made, and we see at least the outlines of the future for CIT and IT generally. Polley retired at the end of June and Steve succeeded her. The university will mount a national search for its new Chief Information Officer (CIO) in the year ahead. So this report will identify accomplishments during a year of upheaval and uncertainty and set out goals for the coming year, recognizing that new leadership will bring a new era.

Major Accomplishments: Last year Polley set out priorities in the following areas:

1. **East Hill Data Center.** Unfortunately, the financial situation for Cornell made it impossible to move forward with the construction of the planned data center at East Hill. CIT staff are developing short-term coping strategies to expand the capacity of the machine rooms in Rhodes Hall. They are replacing air cooling units, dividing hot and cool aisles, all aimed at allowing the current facility to meet Cornell’s needs until a permanent solution can be developed. Polley says that failure to get the new building underway is the biggest disappointment of her term as VP for IT.

2. **University IT Strategic Plan.** Two years ago President Skorton asked Polley to lead the development of a university-wide strategic plan for IT. Changes in the university administration and the economic crisis overtook this initiative. The Provost is leading a broader strategic planning initiative that will include IT, and a major review of IT this year led to the establishment of the IT Governance Committee which will set priorities for IT across the institution. A sense of institutional strategy for IT should emerge from these activities.

3. **Administrative Computing.** We completed STARS (System for Tracking Administrative Records for Students) and launched the Kuali Financials project. Kuali will deliver a new general ledger, transaction processing tools, and especially financial management information for units across the university. One very exciting part of the project is implementation of the workflow tool, Cynergy, to underpin Kuali, but it also will serve as a general workflow tool for other applications as well.

4. **Collaboration Support.** We see wikis, blogs, document sharing, web conferencing, and video conferencing being used now as “everyday” tools at Cornell. One of the most exciting of these is the emergence of personal videoconferencing and chat as a real, practical resource that is helping people work together no matter where they are. These systems are high quality and they “just work”, unlike the herky-jerky performance of first-generation conferencing. Progress does progress…

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**Our Mission Statement**

Cornell Information Technologies (CIT) is committed to partnering with the Cornell community to provide excellent information technology products and services. Our IT leadership and support enable the university to uphold its high standards in teaching, research, and outreach.

**Our Values**

We will accomplish our mission through each and every one of us living our values. These include:

- **Innovation**  Think differently, deliver better.
- **Community**  Working together we all will succeed.
- **Results**  We are responsible for what we do and say.
- **Respect**  We care about each other, and we show it.
- **Integrity**  We say what we mean and do what we say.
5. **Infrastructure.** The Exchange project (formerly Ensemble), which seeks to change the back-end email and calendar infrastructure for everyone and the client experience for most of us, is well underway. Students are now using Cmail, which provides Gmail and other Google collaboration services, and thousands of faculty and staff have converted their email to Microsoft Exchange. Next spring all faculty and staff will convert from Oracle Calendar to the Exchange Calendar and the project will be finished.

The server farm has been segregated into several tiers to allow us to provide appropriate security, depending on the nature of the server’s work.

All of the residence halls now have wireless internet services, and we have decommissioned the wired telephones in student rooms except upon request.

A major effort has significantly improved cell phone coverage on and around campus and further improvements are underway.

**Priorities for Next Year**

1. **Restructuring Cornell IT.** The external consultants have recommended several changes in IT university wide including:
   - A new IT decision making and governance process (the IT Governance Committee has already begun work).
   - A simplification and unification of application development across the institution to ensure strategic alignment and reduced redundancies.
   - The creation of a more efficient end user support program.

   Our priority is to design and implement these recommendations successfully.

2. **Restructuring other Functional Parts of Cornell.** We must support and enable the efficiency improvements in other parts of the university through enhanced IT solutions. As other functional activities strive to reduce their costs, they will turn to IT as a tool to accomplish their goals. We need to respond creatively, nimbly and effectively to these needs.

3. **CIT Service Efficiencies.** On all fronts, CIT will be expected to improve the efficiency and effectiveness of its service delivery and support model. The delivery of solutions to meet the growing and new needs of the university will be of exceptionally high priority. We must identify our utility-level services and push for the greatest cost-effectiveness in their delivery. We will develop new services with a focus on the very highest institutional priority needs and that development must proceed as efficiently as possible. New or improved capabilities in trouble management, service monitoring, metrics and management must be implemented.

4. **Infrastructure.** By the end of the fiscal year the Exchange project should be moving into its “stabilization” phase, with all members of the community being served by Google (students) and Exchange (faculty and staff) email, calendar and other collaboration tools. The Kuali project (Kuali Financials, Kuali Coeus and Kuali Rice) is the major administrative system endeavor. We must also make significant progress in the way we provide access to information and reports from our administrative systems for college and unit-level decision making. The Kuali suite will replace ancient systems with the most modern tools available in higher education.

5. **Institutional Leadership for IT.** The new IT Governance Committee and CIO will set a fresh direction for IT at Cornell. To be successful we must support and enable their activities to help ensure the widest adoption of new technologies, decision-making and broad collaboration.
Building Partnerships to Meet University Goals

Combining efforts with our campus partners helps make university initiatives stronger, more efficient, and more effective. By working in tandem with academic, administrative, and other IT groups across campus, we maximize the impact of our efforts. The results can be seen in areas as diverse as using technology to better support learning, reducing administrative paperwork, and community building.

Account Managers

Our account managers continue to build and maintain relationships with all Cornell’s colleges and some administrative units. By focusing on creating opportunities for collaboration, they help us better support our campus partners’ IT needs and strategic goals.

Academic Computing Collaborations Connect Teaching and Technology

CIT works in partnership with faculty, Cornell University Library, and other groups to directly support the academic goals of the university. By improving the technology tools that faculty and students use, we help them further their research and studies.

Linking Blackboard and e-reserves

In summer 2009, as part of the introduction of the new ARES electronic reserve management system, CIT Faculty Support Services worked with the library to integrate ARES with the Blackboard course management system. Because ARES and Blackboard were integrated in time for the fall semester, faculty and students could easily navigate and review electronic course readings and other class materials.

Information Competency Institute: Improving Undergraduate Research Skills

The Information Competency Institute held June 1-5, 2009, was dedicated to helping faculty focus on how to develop effective undergraduate research assignments. During the event, the sponsors collaborated with faculty to create or redesign assignments that use library resources, such as archival materials and article databases. Participants also examined how to introduce undergraduates to the practice of scholarly research.

The event sponsors were CIT Faculty Support Services, the Cornell IT Policy Office, Cornell University Library, the Center for Teaching Excellence, and the Knight Institute for Writing in the Disciplines. CIT staff members serve on the institute steering committee, and conducted several teaching with technology workshops.

Since the event, faculty and sponsors continue to work together, developing and refining their courses and assignments.

The team responsible for upgrading the Blackboard system to version 7.3 and migrating all courses successfully includes, from left, Vicky Mikula, Steve Lutter, Marina Tokman, Clare van den Blink, Nick Gargan, Heather Damiani, Shaley DeGiorgio, Todd Maniscalco, Barbara Friedman, Jim Lombardi, Donivan Patwell, and Pete Bosanko. Not pictured, David Brooks, Dan Caulfield, Mary Cronk, Joshua DeMelo, Doug Flanagan, David Koehler, and John Wobus.
Administrative Applications Save Paper, Money, and Time

Joint projects between administrative units and CIT produce systems that work more smoothly and efficiently. By converting from paper-based to electronic processes, transactions can be executed faster and easier, cost savings can be achieved, and the impact on the environment is reduced.

Automated Clearinghouse: Moving from Paper Checks to Electronic Fund Transfer

By teaming up with the Division of Financial Affairs and the Treasury Office, CIT created a new Automated Clearinghouse (ACH) service for electronic funds transfer, paving the way for future cost savings. Accounts Payable can use ACH to switch from cutting paper checks to electronically transferring funds. Since going live with a pilot program in May 2009, almost 6,000 vendor payments have been processed electronically.

University Accounting is working with vendors so that by December 2010, the majority of reimbursements and payments will be paid electronically. Paper checks cost seventy-eight cents each, as opposed to eight cents for an electronic transfer. When the majority of payments are electronic, Cornell will save about $80,000 per year.

PeopleSoft Self-Service Applications: Allowing End-users to Control Their Own Data

CIT continues to provide long-term resources and project support to Human Resource Services and the Payroll Office to increase end-users’ ability to view and change their PeopleSoft data. For this series of initiatives, we provide the framework to make PeopleSoft information available, and HR delivers the information through Employee Essentials.

So far, we have implemented Emergency Mass Notification contact information, ePay paychecks view, preferred name, and W-4 self-service. The innovations save paper, reduce questions to HR, and provide employees with direct access to their records well past normal business hours.

APPS Print to PDF: Reducing Paper Use and Distribution Effort

Before the APPS (Automated Procurement and Payment System) Print to PDF project, the old mainframe-based system automatically printed reams of paper reports daily for hand-separation and delivery to individual departments. Working with University Procurement Services, CIT designed a web-based reporting system. Departments can use the online system to pull their own reports and print them in PDF form.

Videoconferencing Bridges the Distance

Though geographically dispersed, the Ithaca campus, Weill Cornell Medical College (WCMC) in New York City, and Weill Cornell Medical College–Qatar are all part of Cornell, and need to interact closely. The Video Collaboration Services group works with WCMC-NYC and WCMC-Qatar counterparts to make smooth, ongoing collaboration possible by facilitating no-fee videoconferencing between the three locations and enabling special events.

On March 7, 2009, scholars in Ithaca and students in Qatar came together as part of the Summit on Women’s Issues in Global Health and Development. To provide a personal perspective to the forum, a videoconference connection was made that let students in Qatar discuss gender issues they face as students in a Muslim country.

Some other types of videoconferencing activity, which occurs between the campuses daily, are classroom support, research group meetings, and meetings of senior administration based at the different locations.

A cutting edge AccessGrid in Weill Hall allows for multi-party videoconferencing.
Summer Seminar Examines the Impact of the Internet on Policy, Procedures, and Judicial Systems

cit.cornell.edu/services/icpl

The annual EDUCAUSE/Cornell Institute for Computer Policy and Law summer seminar took place on July 20-23, 2009, with participants from Cornell libraries, CIT and campus IT partners, the Office of the Judicial Administrator, and University Council. Topics discussed during the seminar, which also drew attendees from across the country, included Google Books, cloud computing, outsourcing IT, and new IT alternatives for campus.

IT Security Council

The IT Security Council comprises security liaisons appointed by the colleges and administrative units, plus CIT’s security leadership. This group of thirty meets monthly to discuss security issues and develop campus-wide approaches for better protecting the university’s IT assets and data.

In fiscal year 09, the Security Council completed development of the security requirements that form the primary content of Policy 5.10, Security of Electronic University Information. The policy’s baseline requirements apply to all computers used to conduct university business, and an additional, more stringent set of rules govern how confidential data is handled.

The Security Council has also discussed approaches to the university data clean-up initiative, revisions to the Edge ACL (network firewall) service, acquisition of a campus-wide encryption solution, authentication and authorization standards, review of the Computer Security at Cornell handbook, and the role of the security liaisons and other department IT staff in incident response.

IT Managers Council

itmc.cornell.edu

The IT Managers Council (ITMC) continues to be a key component of idea and information-sharing among IT leaders at Cornell. The ITMC’s monthly meetings bring together the thirty-eight representatives of the major colleges, administrative units, and CIT areas with university-wide scope.

The Exchange project has been a key topic of discussion, with updates at every meeting. The regular updates have helped ITMC members stay informed about the progress, impact, and requirements of the Exchange project. As a result, they can share their feedback with other members and provide information and direction to their own groups.

Other subjects that have been discussed by the ITMC include security initiatives on campus, staff retirement incentive impacts on IT, and the information gathering being done by Bain & Co. for the Reimagining Cornell initiative.

At the 2009 IT Forum, John Rudan hosts the “Geeks with Antiques” exhibit.

Building Community at the IT Forum

The Information Technology Forum brings together IT professionals from across campus, providing networking opportunities and seminars on common interests. On June 10, 2009, more than 300 people representing a cross-section of Cornell technology experts and users attended the fourth annual forum.

Attendees chose from a variety of seminars about Cornell IT services, such as “Video Streaming Technologies and Services Development” and “Career Development for IT Professionals.” In the “Green Room,” we ran a series of seminars about sustainable computing.

On the lighter side, attendees were invited to reminisce about past technology at the “Geeks with Antiques” exhibit curated by CIT historian John Rudan. In keeping with the historical theme, clips of past computer news and events were on display in the auditorium.
Modernizing Messaging Services

Moving to the centrally-supported Microsoft Exchange email and calendaring system for faculty and staff, and introduction of a new student email service is resulting in upgraded services for all - better remote connectivity for faculty and staff and new calendars and collaboration tools for students.

In October 2009 we prepared the schedule for the colleges and units using Cornell’s central email service to migrate to Exchange, an effort that will continue in stages through the spring. Our target is to move all the users of Cornell’s central email service to Exchange by spring 2010, and later retire the legacy email system. Once email accounts are migrated, we will move Oracle Calendar information into Exchange. Months of preparation and testing will culminate in the entire campus migrating to the new calendar over a matter of days.

Changing tools as critical and personal as email and calendars has required an extensive communication effort, both to prepare faculty, staff, and their IT support staff for the move, and also provide detailed documentation to aid the process. Guides on how to switch to and use the new systems are at cit.cornell.edu/services/guides/.

New students entering for summer 2009 were the first to get Cmail accounts automatically. We invited existing students to convert to Cmail in late April, and by September, more than 9,000 had made the move. The swift migration has allowed us to reduce our investment in mail storage space ahead of schedule. Our goal is for all students to move their accounts by May 2010.

We remain in negotiation with Microsoft to provide a student email system based on Microsoft Live@edu, to be called Umail. Similar to Cmail, Umail will include Outlook Live email, calendar, and other tools, giving students a choice of services. Depending on Microsoft’s ability to meet Cornell’s requirements, our goal is to offer Umail in the second half of fiscal year 2010.

Integrating Productivity Services for Email and Calendaring

Active Directory Service

Over the summer, we delivered the first phase of the Active Directory (AD) service, the directory and authentication infrastructure required for the Exchange email and calendaring system. In the coming year we plan to expand this to a central AD service for campus units, helping reduce redundant systems and increase security while retaining flexibility and control for local AD administrators.

Faculty and Staff Email

cit.cornell.edu/services/guides/facstaff_email/

Early in FY09, we began the detailed planning for moving faculty and staff email and calendars to a Microsoft Exchange-based system, a change driven by needs for remote email and calendar connectivity and better collaboration capabilities. Design and development occurred throughout the year, and teams in CIT began to pilot Cornell Exchange email accounts in September 2009.

We successfully met our objective to roll out a new student email service by spring 2009, and received an enthusiastic response from campus. Named Cmail and provided by Google Apps Education Edition, the student service offers a more robust email platform with a significant increase in storage capacity, plus an array of calendar and collaboration tools. With Cmail, students continue to use their NetIDs with a “@cornell.edu” address.

During fall 2009, the Cmail web page at Computing at Cornell received 160,753 hits. Cmail hits more than doubled the next most popular page, the Computing at Cornell home page, which received 65,926 hits for the quarter.
Developing Contemporary Systems

Kuali Foundation projects being implemented at Cornell will help provide end-to-end consistency, from Cynergy’s reusable development architecture, to features that allow staff in different departments to use the same methods, to workflow capabilities that corral disparate business tasks into one inbox. As Cornell’s requirements for managing, manipulating, and analyzing its data grow more complex, our mandate is to offer and support solutions that promote efficiency as well as encourage flexibility, collaboration, and excellence.

The exploration of managed desktops for university-owned computers demonstrates backing for centralizing services where they improve productivity or security without overly limiting autonomy in the colleges and units.

Bringing Kuali Higher Education Products to Cornell

As a member of the Kuali Foundation since 2005, Cornell collaborates with other universities to develop community-source software built specifically for higher education. Our participation focuses on the Kuali Financial System (KFS), Kuali Rice middleware, and the Kuali Coeus (KC) research administration system. Currently, KFS and Rice are being implemented at Cornell. Kuali Coeus is still under development by the Kuali Foundation.

Kuali Financial System at Cornell

The project to implement the Kuali Financial System at Cornell is co-sponsored by CIT and the Division of Financial Affairs, and the team includes members from both organizations along with subject matter experts from around the university. Implementation began in June 2009 and will progress in three year long phases toward the final release in July 2012. KFS will replace Cornell’s outdated, unsustainable financial system with a powerful, distributed solution that meets the financial requirements of a modern research university.

The major deliverable for the first phase, ending July 2010, is the implementation of a chart of accounts and general ledger ready to accept FY11 beginning balances and transactions. In support of that goal, our efforts include preparing detailed implementation plans for the modules, application interfaces, and data conversion and information delivery elements scheduled to go live in 2011. Work is also in progress on business process analysis, mapping current financial working processes to KFS functionality in order to understand future workflow and identify any gaps that cannot be bridged by changes in procedure.

The KFS team is working closely with liaisons from the colleges and units, who are coordinating implementation efforts in their areas. The liaisons are important points of contact for communications about a project that will change the financial management landscape for thousands of university staff members.

In parallel with the work required to reach our July 2010 deliverables, we will define the resources, schedule, and budget required to complete the KFS implementation’s second phase, to end July 2011. This phase will include the following modules: accounts payable, purchasing, capital assets, and labor distribution.

Kuali Coeus

The primary FY10 objectives are to support the KFS implementation project, which depends on Cynergy; collaborate with the KC implementation project team on its deliverables; upgrade Cynergy; and support the development of automated workflow processes to improve operational efficiency across campus.
Shepherding Cornell’s Institutional Data

Two CIT projects share the core goal of helping provide consistent, accurate enterprise views of Cornell’s institutional data: creating a metadata model, and guiding shared data development and data of record determination.

Metadata (data about data) shows users of business applications, like Cornell’s human resources and financial systems, clear definitions of data. A user can click a data field to see its description along with example values. Managing metadata well is key to ensuring that the same data is entered and reported on consistently in the numerous systems used on campus.

As Cornell implemented new business systems over time, the approach to metadata evolved and Cornell accumulated disparate solutions. Recognizing the need for a global approach, we started the discovery phase early in FY09 for creating a metadata model to apply to all CIT’s data repositories. The next challenge is to standardize methods and practices and then implement a metadata solution that is jointly owned and maintained by Cornell’s business and technical data delivery subject matter experts. Since Cornell has invested in Oracle’s business intelligence suite, OBIEE, we’re exploring its metadata management capabilities as part of the potential solution.

In our ongoing work with Cornell’s shared data committee, CIT consults on institutional and shared data development, design, and use for the university’s PeopleSoft administrative applications. Identifying the data of record, the location of the sole authority for a piece of data, is critical for any large administrative system. Defining where information as simple as a phone number resides and preventing its duplication makes the difference between efficiently managing the university’s business versus managing errors. In FY09, CIT delivered the bulk of a multi-project data review and drafted a strategy document on shared data for the Kuali projects.

Currently, CIT is working with Kuali Financial System and Kuali Coeus project teams toward the goal of a shared architecture for the Kuali data of record. We are assisting the teams as they develop processes to identify shared data between the systems and make internal decisions on common business configurations.

Exploring a Managed Computing Environment

As we reported last year, some Cornell departments lack the staff and resources to centrally manage essential patches for computer operating systems, anti-virus tools, and applications. While patch management solutions have been put in place for some departments, plans to roll out a fee-based service were put on hold in light of the effort to recommend a campus-wide approach.

In fall 2009, a project was initiated to explore a university-wide, integrated managed desktop service. If implemented, the service would establish a high degree of consistency and automation around common practices for managing thousands of university-owned computers, especially at the desktop/laptop level.

Our research suggests that significant savings can be realized in a managed computing environment. Support would become more automated and proactive, cutting the number of basic support calls and freeing technical staff for higher-value activities like instructional support. It would speed operating system patches and dissemination of new virus definitions, helping prevent incidents and associated costs. Additional savings can be obtained by better managing power consumption and right-sizing software licenses. Overall, we would obtain a level of insight into the computing environment that we do not currently have.

Though university IT directors support exploring a managed environment, implementing one would require a cultural shift, as it would likely constrain some of the autonomy that has come to be expected at Cornell. Any system implemented should allow for distributed authority and local adaptation as appropriate, but retain a centralized infrastructure and an integrated view of campus. Moreover, the project’s timing, structure, and budget will most likely be impacted by other changes resulting from the “Reimagining Cornell” initiative.

The Managed Desktop Discovery Project is being overseen by a steering committee with representatives from the College Officers Group, the Faculty Advisory Board on Information Technology, the Dean of Faculty, the Information Technology Managers Council, CIT, and administrative end users.
Piloting OBIEE+: A New Business Intelligence System
cit.cornell.edu/about/projects/obiee/

Oracle Business Intelligence Enterprise Edition “plus” (OBIEE+) is an enterprise-class business intelligence platform and a suite of business intelligence tools that will be integrated with the Kuali Financial System when it is implemented at Cornell. Cornell’s OBIEE+ license includes Hyperion Brio, which campus uses extensively today, and will eventually succeed it as the centrally supported campus data access tool. CIT finished the OBIEE+ discovery phase in June 2009, with the team refining processes and documenting procedures for best practices, standards, and operational support.

The implementation phase, included four pilot projects; by October 2009, two of these were ready for production. Each pilot allows us to test the OBIEE+ enterprise-reporting infrastructure and extend it toward future implementations, especially Kuali Financials.

Our work includes designing a training program that will reach out to more than 2,000 campus Brio users to educate them about the eventual change in tools. The project team has presented OBIEE+ to a wide variety of groups, demonstrating its functionality and encouraging collaboration.

Keeping Ithaca EZ-Backup Data Secure

As of March 2009, all data backed up by Cornell’s central EZ-Backup service is now also stored at a secure Weill Cornell Medical College facility in New York City. In the event that a local disaster disables campus infrastructure, Ithaca data backed up by EZ-Backup will be safe.

CIT reached this milestone in March 2009 in response to a Disaster Recovery Planning Task Force recommendation to protect university data in ways that would be cost effective and empower departments to participate. The task force was put in place in 2006 after the Board of Trustees raised questions about the safety of Cornell data.

Leveraging the high-speed network connection between the Ithaca and New York City campuses and Cornell-owned machinery at Weill results in a more efficient and cost-effective solution than would have been possible using an outside vendor. With the university providing startup and ongoing funding, this redundant and geographically separate storage comes at no additional cost to participating departments.

In the initial phases of the project, IT teams in Ithaca and New York collaborated to copy over 300 terabytes (TB) of compressed legacy data to Weill and set up a new tape library there. EZ-Backup now mirrors more than 350 TB of data between the two sites, and the 5 terabyte of data that were transmitted daily from Ithaca to New York at the outset, has risen to over 6 terabyte. Most of this increase is normal growth of the service (see chart on right); some is a result of new departments participating in the service.

Storing a secure copy of university and department data offsite meets the contemporary data protection standards appropriate for Cornell. Offsite storage, together with CIT’s ability to continuously lower rates as EZ-Backup participation increases, are critical factors designed to make the central backup service attractive to departments and help Cornell benefit from the economies of scale that are possible when departments buy into a central service instead of running local ones.

EZ-Backup mirrors more than 350 terabytes of data between Ithaca and New York. How much is a terabyte? Think of one terabyte as 220 million pages of text or 300 feature-length films. The printed collection of the US Library of Congress is equivalent to 10-20 terabytes.
Revitalizing CIT’s Web Presence

cit.cornell.edu

On February 18, 2009, we launched the first phase of a major redesign of the Computing at Cornell site. Two years in the making, the new design updated the look, improved the navigation, and added new ways to find content in our web offerings. Since the site launch, more than 1,100 pages from thirty sites have been created or migrated in. On average, 1,344 visitors view the front page every day. Due to the large number of CIT web sites created over the years, moving them into the new format is a significant ongoing effort. Since Computing at Cornell is based on a content management system, service owners can keep the web content about their services up to date themselves.

The redesign reflects user preferences discovered through surveys and focus groups, along with best practices for web user experience and accessibility. Visitors are able to get information about our products and services quickly and consistently. There are specialized areas for different audience groups, such as students, faculty, and IT professionals. Consistent page layout and navigation structure make it easier to see where you are and get to where you want to be.

The new site is also more topical, providing easy access to computing news from our own groups, campus, and the world; an events calendar; current status of CIT services and service alerts; and RSS functionality. Looking ahead, there are plans to continue moving old CIT sites into the new format, add new content, and fine-tune the features to continue to enhance the user experience.

Computing at Cornell's refurbished web site launched February 2009.

Hits on Computing at Cornell climbed steadily this year, demonstrating increasing use.
Enhancing Academic Technologies Online

To enhance teaching and learning at Cornell, multiple new course technologies were explored via a Classroom Capture Pilot, an e-Portfolio Pilot, and a Moodle Pilot. Also, the Faculty Innovation in Teaching (FIT) program continued to provide support to help faculty bring innovative instructional ideas to life. The FIT program focuses on encouraging faculty to take advantage of emerging multimedia and web technologies, and participate in workshops and special events highlighting resources being developed and used at Cornell.

Supporting Faculty Innovation in Teaching
blogs.cornell.edu/innovation

The Faculty Innovation in Teaching (FIT) program continues to support faculty projects with planning, instructional design, programming, and video production in collaboration with campus partners such as Cornell University Library and the Center for Teaching Excellence. Nineteen projects were developed during the 2008-2009 academic year. In the past year, projects focused on using collaborative tools, such as blogs and wikis, video and webcasting systems, and virtual worlds. Many projects also have developed collaborative web tools and databases for student research assignments and joint knowledge creation.

The FIT program provides a broad benefit because many of the technologies developed in the program get adapted and applied to other campus projects. This fulfills one of the program’s goals—to research and develop new technologies for teaching and learning. Following are two examples of FIT projects having a broad impact across campus.

A video player using Flash technology was developed by FIT for Professor Susan Fubini’s (College of Veterinary Medicine) project “Videos to Enhance Surgery Training.” The video player became the basis for the one now used on the CyberTower web site. For CyberTower, the Flash player has been programmed to include captions, and shows the video in a full screen without loss of video quality. You can see the player in action at cybertower.cornell.edu.

An interactive mapping tool was originally developed as a community tool to help gather information about issues related to the Cayuga Lake Watershed as part of the “Putting Watershed Education on the Map” project for Todd Walter (Biological and Environmental Engineering). The mapping tool is now being used for courses at Cornell, including BEE 4730: Watershed Engineering, and NATRES 4320: Human Dimensions of Natural Resources.

The FIT lunchtime speaker series continues to provide an opportunity for instructors to speak about their projects and learn about others. For a list of FIT speaker events, see blogs.cornell.edu/innovation/schedule-of-events/.

Considering Moodle as a Course Management Alternative

In 2007, a project to examine alternative course management systems (CMS) identified Moodle as best able to support and enhance teaching and learning at Cornell, while also having the functionality needed for course administration. During the 2008-2009 academic year, a pilot was launched to evaluate faculty and student satisfaction with Moodle versus Blackboard. Support, infrastructure, and costs were also evaluated.

The Moodle pilot team presented its data to CIT leadership and the Faculty Advisory Board on Information Technology (FABIT) in May 2009. The data indicated that faculty and library staff have a strong preference for Moodle. It was noted that one of the strongest benefits to Moodle was the ease of editing and time-savings to faculty. Moodle had all of the feature criteria compared to Blackboard, and in many cases, Moodle was shown to be an improvement over Blackboard.

A transition to Moodle would be comparable to the next Blackboard upgrade in terms of staffing, costs, and impact on users. To successfully move to Moodle, which is an open source CMS, Cornell would have to trade increasing Blackboard licensing costs with investment in the skills and resources needed to implement and maintain an open source solution.

FABIT endorsed pilot recommendations to move ahead and continue exploring Moodle as a course management tool for Cornell. Issues surrounding a Blackboard replacement are being reviewed with critical campus stakeholders before a final decision is made. Stakeholders include instructors who use Blackboard, the Registrar’s office, the Assistant Dean’s group, Cornell University Library, Faculty Senate, and IT support staff. It will be up to the Information Technology Governance Committee to make a decision about Cornell’s course management system.

Pilot data demonstrating faculty and staff experience with Moodle

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Fall 08</th>
<th>Spring 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>High levels of satisfaction with Moodle</td>
<td>80%</td>
<td>86%</td>
</tr>
<tr>
<td>The benefits of migrating to Moodle</td>
<td>72%</td>
<td>64%</td>
</tr>
<tr>
<td>Moodle outweigh the costs of migrating from Blackboard</td>
<td>67%</td>
<td>69%</td>
</tr>
</tbody>
</table>

The response rate for faculty surveys was twenty-two out of forty active pilot participants in fall 2008, and fourteen out of twenty-eight during spring 2009.
Demonstrating Learning with e-Portfolios

CIT Faculty Support Services and the Center for Teaching Excellence are piloting an online educational portfolio and assessment tool to collect student work representing accomplishments, learning, and course assignments in multimedia formats. The software facilitates the review of student-submitted assignments and allows for informal feedback or a formal evaluation process.

The e-Portfolio software helps students and faculty organize, archive, and interact with portfolio work.

- Student work is archived (which is also useful for Middle States re-accreditation).
- Students can reflect on the process of developing their work, such as steps taken for research, content development, editing processes, etc.
- Students include the best assignments for a course to demonstrate meeting the learning objective.
- Faculty organize their files and assignments electronically.
- Faculty see how students are linking assignments with course objectives, and can provide feedback on student processes.

The first phase of the pilot was completed during the 2008-2009 academic year. A report and case studies are available at confluence.cornell.edu/display/eportfolio/Home. The next phase is taking place during the 2009-2010 academic year, and will give more instructors an opportunity to use the software, and determine if e-portfolios should become a campus service.

Case Study

Barry Perlus, left, of the College of Architecture, Art, and Planning, is using the system to enhance and track his photography students’ learning processes by asking them reflective questions when they submit their photographs in the e-Portfolio system. Questions can range from “Why did you choose that ISO setting?” to “Why did you choose to change the developing process?” Comments travel with the end-product in the software, so both student and instructor can refer back to them at any time.

Barry Perlus uses e-portfolios to reinforce photography processes and techniques with his students.
Online Videos of Classes and Seminars

Campus has seen increasing interest in methods to easily record classes and seminars and then distribute them online with minimal processing. In response to this interest and to a supporting initiative by FABIT, CIT, and the College of Engineering, a classroom capture pilot project was implemented.

A classroom video capture system (Echo360) was installed in four differently sized and designed rooms, where it recorded a variety of lectures. The pilot team evaluated the system, usage by presenters, support requirements, post processing required, usability of output, end-user audience experience, and the overall need for automated classroom capture technology at Cornell.

In the case of a seminar series in Upson, which included presentations by candidates applying for jobs at Cornell, automated video recording was very valuable. The recordings were critical for faculty to have an opportunity to review candidates even if they weren’t able to attend the seminars. Students in Dr. Pat Cassano’s Nutritional Epidemiology distance learning class (with Weill Cornell Medical College) came to expect the recorded lectures and would ask for them to be posted online.

The ECHO 360 was used mostly for seminars and colloquia. Recording could either be scheduled or started manually, and the output was automatically indexed, enabling viewers to skip to a particular part of the presentation. Faculty and students were satisfied with the quality of the recordings for lectures.

Despite a generally good reception from faculty and students that used the system, demand for classroom capture did not increase throughout the pilot. As a result, the project will continue to be evaluated to determine if broader campus deployment and support of an automatic classroom capture system is worth the investment to Cornell at this time.

CyberTower Updates

Faculty Support Services worked in conjunction with the School of Continuing Education and Cornell Adult University to launch an improved CyberTower, the online link to Cornell faculty and their research. In response to user interests, CyberTower has been redesigned with simpler navigation, and technological upgrades such as closed captioning, video that can be viewed full screen without loss of quality, and other new features.
Raising Computer Security Awareness

This year we launched a campaign to increase awareness around security concerns and foster a culture of personal responsibility. As part of this effort, a new PDF e-book, Computer Security at Cornell: Secure Your Computer On and Off Campus, was developed and made available to faculty and staff. The material in the handbook also formed the basis of a revised security web site on Computing at Cornell.

The e-book, which has been downloaded more than 1,900 times since February 2009, is full of quotes, links to trusted sites, analogies, and news articles to help teach faculty and staff:

- Why secure computing is your responsibility
- How to recognize and respond to possible security problems
- How to protect your identity
- How to protect university data
- How to secure the computer you use at Cornell
- Internet safety
- Secure computing practices when working off campus

Both the handbook and the web site include everything most people need to know about the new security requirements that are being introduced in Policy 5.10, Information Security.

Other educational and awareness materials, such as a public lab computer desktop image alerting students to the risk of falling for phishes, and a postcard reminding faculty and staff to set their NetID security questions are part of the greater campaign to continue to keep messages about computer security on people’s minds.

As part of National Cyber Security Awareness Month, Cornell also welcomed other universities to use the computer security e-book as a resource for the development of additional campus awareness and educational materials.

Don’t Click That

The IT Security Office has developed a one-hour presentation entitled “Don’t Click That.” Aimed at non-technical audiences, this interactive session discusses various risks to university data, the current state of Internet crime, and how to avoid attempts to defraud over the Web or electronic mail. The seminar is available to interested departments. Email security-services@cornell.edu for information.
Data Discovery Tools

To support both the campus-wide data discovery effort and CIT IT Security incident response and analysis, Spider 2008 and IdentityFinder have been made available to the campus community.

Spider 2008 is a fundamental redesign of Spider software we’ve had for years. In contrast to previous versions, which were built around an IT-directed scan model, Spider is a self-service system. End-users should be able to scan their own machines and take whatever remedial actions are appropriate.

The redesign of Spider is an outgrowth of interest from Cornell and other Spider user sites to develop something usable by a casual person, with minimal IT support. Feature-wise, Spider 2008 is complete. Several universities have expressed an interest in centralized reporting, though. For more information, see cit.cornell.edu/services/spider/.

In addition to updating Spider for end-user availability, we licensed approximately 10,000 copies of IdentityFinder for both PC and Mac. With powerful centralized reporting, excellent Outlook integration, and easy deployment, IdentityFinder significantly augments our data discovery and incident response capabilities. For more information, see cit.cornell.edu/services/idfinder/.

Enhancements to Campus Incident Response Program

Previously, when a system was compromised, IT Security was required to capture an image of the entire drive, run Spider on that image, search for signs of malware, and then laboriously go through a process to gauge risk of data loss. This process could disrupt a department’s work, because it would often keep a machine out of service for several days. Additionally, modern varieties of malware are significantly smarter and more flexible than when our procedures were developed.

When a system that may hold confidential data is compromised, we’re obligated to analyze the affected system to help inform DIRT (Data Loss Incident Response Team), a group representing various campus offices that decides what action the university should take in the event of a data breach. An ongoing project within IT Security is to develop a new process that should allow us to gather more data, faster, while minimizing our impact on department operations. This new process also means we quickly get an accurate, informative alert to DIRT.

Easier Password Management

The password complexity requirement was first implemented in 2005. Since then, Cornell’s alumni and trustee community have been brought on board with the use of NetIDs to access Cornell services.

Feedback provided from those customers and the offices serving them demonstrates that coming up with a password that meets the requirements can be challenging and even frustrating. We began looking at ways to ease this task without sacrificing the added security of complex passwords.

The changes made involved giving the user immediate feedback as they enter the characters that make up the password. Users can tell at any time during the process which requirements they have yet to meet. Previously they would have to submit the proposed password before they received a “pass/fail” report.

We also modified the restriction on dictionary words to make the use of passphrases possible. Some people find creating a password that is associated with a phrase (a passphrase) easier to remember. By virtue of its length, a passphrase is stronger than a password. If the dictionary word is less than five characters or makes up less than forty percent of the passphrase, it will be accepted.

The use of complex passwords is an integral part of keeping university data and individual identities safe. Simplifying their use will add strong support for this security practice.

“Flush the Phish” awareness materials remind students to keep their NetIDs private.
Giving Campus Options for VPN Departmental Groups
cit.cornell.edu/services/vpn

The campus Virtual Private Network (VPN) service is available to any faculty, staff, student, affiliate, or visitor with a sponsored NetID. It allows users to connect securely to the campus network and access campus services online from anywhere.

The departmental VPN service is an outgrowth of the existing VPN. A department can have a small pool of campus-only IP space that is tied exclusively to a community of users they define. A department using the departmental VPN service can more carefully control remote access to their networks or IT assets.

By providing a higher level of security for remote access to local resources, a departmental VPN can help ease concerns around telecommuting, which may broaden support for this practice, including in the event of any emergency, asking staff to work from home instead of coming in to campus.

Now that the development of the departmental VPN service is complete, consideration is being given to an SSL based VPN service that will allow you to access VPN via a browser over the web.

Providing an Active Directory Service

The effort to develop a campus Active Directory service was undertaken as a component of the Exchange project to provide a foundation for messaging services (campus email and calendaring), and provide a centralized service for campus units to manage their users and computer services without having to support their own Active Directory instance.

Active Directory is an enabling technology/service that is a necessary component for Exchange. Once a centralized Active Directory is fully deployed, it can serve as the foundation for many other campus services such as desktop management, filesharing services, and application authorization based on group membership.

Originally the project was initiated in response to requests from campus units for a central Active Directory service. When a decision was made to deploy Exchange email and calendaring services for faculty and staff, Active Directory was folded into the project. Right now, it is vital that we ensure we are delivering the components of the Active Directory service that are part of rolling out Exchange.

Eventually most campus users will interact with Active Directory in one way or another, although it will be “in the background,” supporting a wide range of computing services (printing, filesharing) and applications.

The project is currently underway with support for the Exchange deployment as the highest priority. In 2010 we will offer the Active Directory service to campus units who wish to join, either to avoid the cost of deploying their own instance or to get out of the business of supporting their own service.

Providing Telecommuting Information to Campus

Telecommuting has long been part of our daily work lives at Cornell, but CIT also recognized that the campus would benefit from additional information about telecommuting as members of the community contemplated how to continue to do business and teach in the face of an event like a widespread illness or an emergency closure of campus.

We developed and published three guides designed to be useful for everyday telecommuting or remote teaching, as well as more extended periods of telecommuting that might occur because of a campus emergency.

- A Telecommuting Guide for Cornell Faculty and Staff is for all employees and provides guidance on everything from Internet Service Providers in the Ithaca area, to tips on at-home computer and Internet security, to how to choose between web, video or telephone conferencing for remote meetings. The guide is available at cit.cornell.edu/services/guides/telecommute/facstaff/.

- Teaching Remotely and Distance Learning Support describes how to create an online lecture and how to use chat, discussion board, and web-based collaboration tools in connection with distance teaching and learning. This information is available at confluence.cornell.edu/display/FSSDOC/Distance+Learning+Support.

- The Telecommuting Guide for IT Professionals and their Leadership poses many questions and issues that campus units might want to consider as they position employees to work successfully from home. It also provides links to resources available to this group. The guide is available at cit.cornell.edu/services/guides/telecommute/it/. 

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Building a Policy Foundation for CIT

Our IT Policy Office facilitates the development of university-level IT policies through the University Policy Office, and educates the Cornell community on matters of law and policy in the electronic realm. We also actively participate in discussion on matters of law and policy in information technologies for colleges and universities nationally through a variety of venues. Recently, focus in IT Policy has been on driving initiatives to increase security and privacy of institutional data, providing web accessibility throughout Cornell’s network, and developing digital literacy among the campus community.

Information Privacy and Security

Our IT Security and IT Policy Offices have been driving a number of initiatives to enhance the security and privacy of institutional data. Included in these efforts are the interim promulgation of IT policy 5.10, Information Security, for the Ithaca campus; the facilitation of the Advisory Committee for Shared Institutional Information; and continued work toward the completion of the IT Policy framework grounded in the themes of privacy, security, and conventions for IT on campus.

Web Accessibility 5.11 Progress

After seven years of development and in concert with the University’s Disability Plan, the IT Policy Office will present the draft University Policy, 5.11, Web Accessibility, to the Executive Policy Review Group for final review early in 2010. For more information, cit.cornell.edu/policy/webaccess/resources.html.

Training provided to campus by CIT

The number of training classes provided by CIT has continued to increase. For training resources see cit.cornell.edu/training.

Digital Literacy Program Launched

digitalliteracy.cornell.edu

The IT Policy Office, with funding from CIT and content contribution from the Undergraduate Information Competency Initiative and Cornell University Library, created the online Digital Literacy Resource.

The web site provides students with information about copyright, academic integrity, critical thinking and privacy when using information technologies and the Internet to do academic research.
Diversifying the Cornell Network

Robust, redundant voice and data infrastructure is increasingly important as campus moves to more reliance on modern technologies such as videoconferencing, electronic data storage and backup, and Wi-Fi access. This year, a major push was made to increase the efficiency and reliability of Cornell’s network by adding redundant WAN connectivity to Rochester and doubling capacity to New York for EZ-Backup and other initiatives. Additionally, two new cell sites were added to increase on-campus coverage. Coupled with Wi-Fi, which was made available throughout North Campus residence halls, Cornell is now well on its way to providing more types of coverage the campus community is requesting.

Bringing Wi-Fi to North Campus Residence Halls

CIT’s EzraNet project and Campus Life pooled resources to install 640 RedRover Wi-Fi access points throughout 17 North Campus residence halls, bringing the total number of access points on campus to over 2,000. Previously, the Wi-Fi signal on North Campus was mainly in common areas. The latest 802.11n technology was used, offering superior bandwidth.

As student cell phone usage has risen, room phone use has been declining. During the Wi-Fi upgrade, 4,000 room phones were removed from North Campus residence halls and 194 hallway phones were added. Campus Life elected to invest in the Wi-Fi upgrade, rather than maintain student telephones, so that students can have better access to the currently preferred technology.

Making Wi-Fi more accessible in residence halls creates a more satisfying living environment for students on North Campus, who can now use their laptops just about anywhere and are not confined to the narrow bandwidth of cell signal when accessing the Internet through Wi-Fi-enabled smartphones or devices. CIT EzraNet, Campus Life, and Project Design and Construction collaborated to complete the project on time and under budget.

RedRover registrations almost doubled last year.
July 2008 - 24,139
July 2009 - 43,204

RedRover metrics reported July 2009

- 28,766 members of the Cornell community have registered 43,204 devices to use RedRover.
- Maximum number of devices found using RedRover concurrently: 4536.
- Number of access points installed providing RedRover: 1950.
- Number of buildings with partial or complete RedRover coverage: 173.
Improved Cell Coverage On Campus

In collaboration with AT&T Mobility and Cornell Real Estate, we completed the installation and activation of two new cell sites serving the Cornell campus.

Rooftop antenna systems were placed in service on Mary Donlon Hall and Bradfield Hall. These two locations add much needed coverage and capacity relief within AT&T’s regional network. As a result, cell coverage, as is needed for the iPhone, has been enhanced on North Campus near freshman housing, as well as in the central areas and south sides of campus.

Installed to complement historic buildings and aesthetics at Cornell, the new antennas provide extended signal strength over the challenging campus terrain, help cell signals to penetrate more buildings, and support emergency mass notification.

Real Estate plans to continue working with us to equalize coverage on campus among participating carriers, so people will be able to choose the service provider that most effectively meets their needs. All providers that meet minimum requirements to do business at Cornell are invited and encouraged to increase campus coverage. Verizon Wireless continues to be an important service provider at Cornell and will continue to work strategically with the university on future plans.

Improved Cell Coverage Inside Buildings

This year we will continue to investigate, evaluate, and test technologies designed to improve indoor cellular coverage as dependency on wireless services grows. We are working closely with major cellular providers to identify and implement solutions to help meet this complex challenge.

Completed EzraNet Buildings

As a result of the university construction pause, announced in fiscal year 09, EzraNet, Cornell’s program to upgrade data wiring, phone wiring, and distribution infrastructure, was put on hold. However, Rhodes Hall, which was already in construction, was completed. The network infrastructure upgrades for Bard, Kimball, Thurston, and Riley Robb are planned for completion in FY10.

The EzraNet program plan is currently being revised and funding sought after to continue development efforts for network infrastructure on campus.
An audio-video capture system for producing a range of quality, and servicing a variety of venues. For example, Cornell might need some systems that are fixed in one place, perhaps in selected classrooms, and some portable systems that are easily moved.

A media hosting solution for storing video and serving it out in appropriate formats.

The first step in the process has been to engage the university community in a series of discussions held during the 2009 IT Forum and two video summits hosted by CIT and attended by members of Cornell’s Ithaca and Weill Cornell Medical College audio-visual communities.

A variety of needs, concerns, questions, and approaches emerged along with a straw architecture based on standard technologies and systems.

The next step is to establish a video streaming task force to advise CIT and Cornell as the university develops its comprehensive video streaming plan.
Responding to Change and Containing IT Costs

Continually improving our products and services has enabled economies of scale and lowered costs for some services, helping campus departments better use and secure their information. By retiring and streamlining some services, our staff has been able to focus on projects with higher impact. On a smaller scale, we are developing a series of cost-saving tips for CIT services to help inform technology decisions campus departments must make.

Holding the Line on Rates and Improving Service

Along with the rest of the university, CIT must creatively cut costs even as we continue providing services to help Cornell fulfill its mission. As such, we are aggressively looking to better align our resources with campus. To assist colleges and units in meeting their budget targets this year, we have not raised rates for CIT services. Nearly half of our fee-based services lowered their rates, as much as twenty-five percent in the case of EZ-Backup.

Services that lowered rates:

- EZ-Backup
- Net-Print
- On-Site Solutions*
- Storage Farm
- Video Services*
- Web Hosting*
- Web Production

* Multiple services are offered in these categories, and some rates were lowered while others were unchanged.

Cutting Budgets to Help Cornell Meet its Goals

Our planned budget for FY09 was $78 million, but pauses in hiring and construction, including the slowdown of EzraNet, resulted in $66 million spent for the year. We are on a trajectory to spend $60.4 million in FY10 as the university lowers IT spending to help meet its overall financial targets.

In addition to making necessary budget changes, CIT’s staff count was reduced by thirty-three positions, twenty-two of which were achieved by employees taking advantage of Cornell’s staff retirement incentive (SRI). Beyond the nearly $10 million reduction due to construction pauses, CIT funding was reduced in several major areas, including $2.2 million in base funding, over and above the nearly $2.4 million reduction resulting from SRI.

CIT has balanced the base budget by pursuing virtualized public labs, consolidating the management of collaboration tools, outsourcing student email, not filling open positions across multiple services, and reducing support service costs for human resources, finance, project management, travel, training, events, etc. Administrative systems costs have been reduced through new approaches to procuring Oracle and PeopleSoft application maintenance, optimizing and leveraging server-based capacity, and other operating expense reductions.

Close to $0.8 million in annual expense was reduced when the National LambdaRail lowered its costs, a significant savings on the ultra-high performance network Cornell researchers require.

On June 19, CIT honored its departing retirees in an event in Clark Hall. Among the people whose dedicated service to CIT and Cornell were honored were, from left, Pat Nelson, Kathie Struble, Jan Jesmer, Mark Mara, Polly McClure, Rosanne Murphy, Jim Lombardi, Ann Santiago, Gene Holleran, Gail Shaff, Deb Chilson, Doug Wheeler, and Helen Russler. Not pictured, Chuck Thomas, Dan Miller, Gary Domke, Gary Ingraham, George Medlar, Jim Conley, John Becker, Marjorie Wolff, and Rich Fraboni.

Retiring Outmoded Services

Two long-standing but dated services were decommissioned in the past year: the EZ-Remote modem dialup service and CU People, the university’s personal web page service. Both were put in place when commercial alternatives were scarce. Discontinuing support for them makes sense now that broadband is widespread and a person can establish several web presences with no cost at all.

The decision to end support was vetted by the IT Managers Council, the Faculty Advisory Board on Information Technologies, and other stakeholders. As a result of these retirements, we were able to save money that would have been required to update both systems, decommission old equipment, and redirect staff to the project of moving faculty and staff to Exchange email.
Looking Ahead

Though budget constraints may limit our ability to address new initiatives, they promote diligence in finding solutions. Looking ahead, we are preparing for forthcoming recommendations from the university’s strategic planning initiative, “Reimagining Cornell,” before setting targets for next year.

FY10 Direct Costs of CIT Programs ($60.4M)

This chart presents the direct costs of all CIT activities. Direct costs are expenses incurred specifically for a program or service; for example, the cost of equipment purchased for a service or the salaries for technical staff who develop a service.

FY10 Total (Full) Costs of CIT Programs ($60.4M)

This chart presents service costs after all central support and general support costs have been distributed to them. Support costs include everything from the Contact Center (HelpDesk) and documentation support to systems support to costs for our financial, human resources, and management structure.

FY10 Total (Full) Costs of CIT Programs ($60.4M)

This chart shows the overall breakdown of CIT costs for salaries, capital, and general expenses.
<table>
<thead>
<tr>
<th>Program</th>
<th>FY10 Total Budget</th>
<th>FY09 Actuals</th>
<th>FY08 Actuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Computing and Infrastructure</td>
<td>$19,409</td>
<td>$18,582</td>
<td>$17,380</td>
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<tr>
<td>Applications Development and Maintenance</td>
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<td>Applications Development and Maintenance - Data Delivery</td>
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<tr>
<td>Infrastructure: Database Administration</td>
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<tr>
<td>Infrastructure: Hosting Services</td>
<td>357</td>
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<tr>
<td>Infrastructure: Middleware and Collaboration Tools</td>
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<td>Infrastructure: System Enhancement Funds Operational Support</td>
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<td>Infrastructure: Security and Identity Management</td>
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<tr>
<td>Mainframe, Production Control, and Systems Support</td>
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</tr>
<tr>
<td>Public Labs</td>
<td>916</td>
<td>847</td>
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<tr>
<td>Video Collaboration Services</td>
<td>529</td>
<td>417</td>
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<tr>
<td>Leadership and Outreach</td>
<td>$4,041</td>
<td>$7,527</td>
<td>$6,635</td>
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<tr>
<td>Advanced Technology and Architecture</td>
<td>576</td>
<td>718</td>
<td>706</td>
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<td>HeinOnline Hosting Service</td>
<td>217</td>
<td>167</td>
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<td>CIT Leadership &amp; Support, National Programs</td>
<td>2,209</td>
<td>3,192</td>
<td>3,119</td>
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<tr>
<td>Security</td>
<td>689</td>
<td>708</td>
<td>762</td>
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<tr>
<td>Contributions to CIT Services and CIT Projects*</td>
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<td>2,742</td>
<td>1,897</td>
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<td>Campus IT Infrastructure</td>
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<td>Voice and Data Services</td>
<td>15,795</td>
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<td>18,032</td>
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<td>EzraNet and Infrastructure Upgrades</td>
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<td>3,610</td>
<td>8,037</td>
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<tr>
<td>Total</td>
<td>$60,437</td>
<td>$65,836</td>
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* Represents subsidies from appropriations to cost recovered services. Related expenses are also included as a cost of CIT services.
Acknowledgments

This report covers fiscal years 2009-2010. All staff listings reflect staff employed from July 1, 2008 to June 30, 2009.

Many thanks to Karen Daniels, Shaley DeGiorgio, and Lynn Yenkey for photography, everyone who provided information and reviewed drafts, and everyone we photographed to help show the diverse community in which we work.

Written by Teresa Craighead, Shaley DeGiorgio, Matt Klein, and Lynn Yenkey of CIT
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Designed by Sebastian DeGiorgio of DeGiorgio Design
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