Message from the CIO

There has never been a time throughout my career in which data has been so central to the mission of information technologists and the institutions that they support. Data is the lifeblood of what we do, and data can change the way we live and work. Data is everywhere and right at our fingertips. Both private and public systems and applications capture, store, and transmit data. We no longer live in the world of gigabytes; Yale is now approaching 10 petabytes of data. Such proliferation of information generates new discoveries and permits more informed decisions.

As we enter a new academic year, Yale’s capacity to support data is growing faster than any other aspect of technology infrastructure. Infrastructure to support data extends across multiple disciplines and requires a great deal of coordination. It is no longer just within the purview of the technologist to manage the data; it requires strong collaborations across Yale to ensure three key things: accuracy, timeliness, and stewardship.

Growing Demand

In addition to these collaborative efforts, there is a great need for technological infrastructure to be built to support the speed, variety, and volume of data. Data is also used more frequently and in greater quantity by Yale researchers. In the past year, Yalies have used 91,453,567 hours of CPUs to do research. In our High Performance Computing clusters, we have more than 19,000 cores installed and 6.7PB of storage.

Yale is already on the path of addressing the challenges associated with the increased demand. In the past year, we have implemented a dedicated science network to move large volumes of data from labs to high performance computing clusters at speeds that are at the upper limit of current technology. In addition, we are implementing a new solution for data storage at Yale. Storage tiers will be made available that will allow us to optimize storing of data for processing, transfer, and long-term storage.

To ease the use of data, new data visualization platforms and data virtualization have become part of our IT strategy. Our new developer portal, coordinated by our Integration Competency Center, supports these services and other application development efforts.

It is no longer just within the purview of the technologist to manage the data; it requires strong collaborations across Yale to ensure accuracy, timeliness, and stewardship.

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Produced by the Office of the CIO
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Message from the CIO

ITS is helping the university take on the larger task of overall data governance. This is a campus-wide approach to access, security, classification, and other key attributes and metadata needed to have consistent, accurate, and secure data.

Supporting Innovation

I am excited about the challenges before us, and the ways that data will drive new discoveries in research, new modalities in teaching, and enhanced learning. In addition, data and data analysis will provide greater efficiencies in administrative operations.

As an organization, ITS is focused on the most strategic methods to support the use of this vital data in the work that you do. We look forward to increasing opportunities in FY16 to collaborate with the Yale community to support the mission of the university.

If you are interested in learning more, connect with us by emailing helpdesk@yale.edu, or peruse our long list of services available to you by visiting its.yale.edu.

Sincerely,

Len Peters
University Chief Information Officer
Associate Vice President
Across academia, researchers are looking for new solutions to interpret, preserve, and disseminate the large volumes of research data being produced. There is a timely institutional commitment on a number of different fronts to facilitate the use of data by researchers here at Yale, with current efforts focused on three main areas: education and outreach, data governance, and data infrastructure.

A large amount of effort has been focused on education and outreach in the past year, as this area is viewed as foundational to future endeavors on all three fronts. In the fall, Yale hosted the Day of Data 2014 featuring prominent speakers such as Philip Bourne, the National Institute of Health’s first Associate Director for Data Science, and Cathy O’Neil, author of “Doing Data Science.” The event was a joint partnership between the Office of the Provost, Information Technology Services, the Yale University Library, the Institute for Social and Policy Studies, and the Yale Institute for Network Science. This was followed by a Day of Data Spring Discussion Series, featuring topics such as “Generating Knowledge from Complex Health Care Data,” “Why is American Health Care so Expensive? Using Big Data to Provide an Answer,” and “Computer Simulation Recreates the Universe from Big Bang to Today.” These events provide university researchers a forum to discuss challenges and solutions to common problems.

**Discussing Data Science**

The university also hosted a number of additional external and internal meetings on data science. For example, ITS Research Technology Services co-hosted the Northeast Regional Computing Program’s event on “Research Technology Services: The Data Challenge” with Harvard University and Tufts University. The Deputy Provost for Research and the Yale Institute for Network Science hosted a meeting on Data Science at Yale that featured faculty and administrators from around campus brainstorming about the future of data science at the institution.

Other modes of outreach to the research community on topics related to data science and data management include the Data and e-Science Group (DaeG) mailing list (daeg@mailman.yale.edu), run by the Yale University Library, and the data management planning services offered by the Research Data Consultation Group (see http://researchdata.yale.edu for further details).

On the governance front, a Research Data Policy Committee currently is engaged in drafting an institutional data policy that will provide guidelines for faculty members on areas such as security, access, ownership, retention, and preservation. This is an exciting step forward that will help faculty members meet the stringent new federal requirements on sponsored research.

**A New Center at Yale**

Another organizational step forward is the creation of the Yale Center for Research Computing (YCRC), which will advance research throughout the university by providing a home for both computationally and data-intensive research. Dr. Harlan Krumholz and Dr. Daisuke Nagai have been appointed as co-directors of the center, and will help set and implement the academic and strategic directions of the YCRC. Both co-directors are producers as well as consumers of “big data,” and will bring a great deal of experience in this area to their new positions.

On the infrastructure front, Information Technology Services has increased its efforts to provide researchers with data storage options. The goal is to provide researchers with a cost-effective, easy-to-use suite of storage services to house research. This will migrate researchers from local machines to a centralized infrastructure, allowing the institution to preserve research outputs in a manner that is both efficient and compliant with current regulations.
Expanding the Network

Another challenge for researchers is computing against large volumes of data. ITS, in collaboration with the YCRC, is expanding the National Science Foundation-funded Science Network, a 100 Gbps network that allows the transfer of large data sets to and from the high performance computing clusters. In addition, the university has expanded access to the high performance computing resources in response to an increased computational demand across a diverse set of disciplines. Taken together, these components provide the foundation for an enhanced cyber-infrastructure to deal with the deluge of data generated by advances in instrumentation across disciplines.

Various facets of the university are looking to address the data challenges faced by researchers at the institution. FY16 and beyond will see continued work in the areas of education and training, data governance, and data infrastructure, but will also provide an opportunity to enhance analytics capabilities. This will allow the university to turn the massive quantities of research data generated into new and innovative discoveries.

Yale’s Data: Balancing Risk and Opportunity

The technology we use every day in our personal lives sets our expectations for the technology we use at work. Amazon Echo and Siri show us how technology, backed by data, can help us with routine tasks; infographics show us how information that is well organized and presented can enhance our understanding of complex issues. We want the same ease and understanding at work. I expect we have all, in moments of frustration, compared some work tool unfavorably with Zappos or Netflix. But these tools and technologies are built on rich data tools. As part of the open data movement, governments, companies, news organizations and libraries are making more and more data available for entrepreneurial use and reuse, leading to sophisticated tools that also affect our understanding of what is possible and normal for data-driven analysis and presentation.

Higher education and Yale are active participants in the “data revolution” but our enthusiasm has been directed mostly toward the creation of scholarly data and tools. This is as it should be—enabling research is a core mission of the university. We have not, though, been so quick to adopt a more open position concerning the other sorts of data that we regularly collect, maintain, and use.

For understandable reasons related to the regulatory environment in which we operate (I’m looking at you, FERPA), higher education and Yale historically have adopted a very protective stance towards student, administrative, and teaching data. However, we must balance risk with opportunity for innovation, taking care not to become data hoarders rather than data stewards. If we focus singularly on data protection, we risk depriving ourselves of the chance to make our work lives better and easier, and potentially depriving others outside of Yale of innovation and knowledge.

Growing Demand for Access

As data assets proliferate on Yale’s systems, it has become increasingly obvious that Yale must implement frameworks to help us govern, access, disseminate, preserve and make decisions about our data. As the expectations for data in society have shifted, students, researchers, faculty, and staff have been clamoring for more access to Yale’s administrative data. They want the data to do their jobs, communicate, guide decision-making, generate new information, conduct research, and develop apps.

Yale’s process for granting access needs to keep pace with the demand. When considering requests for access to information, data stewards should balance security with the immediacy of business needs, business intelligence, and the potential for innovation.
Integrations, APIs, Dashboards, and Stewards, Oh, My!

We have a dynamic digital data explosion happening in society paired with a slower-to-change, more careful culture within Yale and higher education. How do these changing expectations from students, faculty, and staff drive the IT department to change its services? How does IT maintain our current staffing and budgets while transforming our organization from an infrastructure-centric IT group to a service- and data-oriented IT organization?

Yale has been working on many fronts to make data more accessible to students, faculty, and staff. ITS has been building capabilities in a variety of areas that we are hoping will help alleviate the pain and frustration that the community feels around access to data.

- **Web Strategy Project.** ITS has embarked on a two-year capital project that focuses on building out our web platform, Drupal (Yalesites), and making data more reusable for everyone at Yale. This project focuses on four areas of data re-use: people, places, events, and courses. Places and events are available through the Yale Developer Portal.

- **Integration Competency Center (ICC).** The ICC is a newly formed organization focused on building a strong foundation for data integration tools that are auditable and governed. This team has been deeply engaged in a multiyear project to build an Identity and Access Management function as well as tools to host and manage integrations among systems.

- **Yale Developer Portal.** This website pulls together Yale developer resources and provides access to and governance of a growing list of APIs and data feeds.

- **Data Governance.** ITS, with the Library and the Office of the Provost, has been working on a set of recommendations and guidelines to help the university clarify how decisions about data get made.

- **Data and Decision Support Center.** This new organization within ITS is transforming the former business intelligence (BI) function for Finance and HR into a university-wide service.

Where We Are Headed: Generation, Creativity, Entrepreneurship

“Yale has a tripartite mission: to create, preserve, and disseminate knowledge.” The project to strengthen access to Yale’s data directly reflects that mission. The rewards for appropriately opening access to data at Yale are unknown. We know that people want dashboards to look at university information; we know that students are clamoring for access to their academic data to mash up with other information to enrich their Yale experience; we know that developers want integrations between systems; we know that our staff across the university would like to stop re-entering data and maintaining unnecessary shadow systems; we know lots of things.

But there is much, much more that we don’t know because when you synthesize information in new ways, it creates new ways of thinking, provides new ways of learning, or new knowledge.
## Teaching, Learning, & Research

### AV Group Installs Learning Technology Studio at School of Nursing

The ITS Audio Visual Systems Design group installed a Learning Technology Studio at the Yale School of Nursing. The Learning Technology Studio fits in the space of a single private office and is designed to provide easy access to the equipment and software used to deliver online education.

The project was a collaboration between the School of Nursing, which has an active online Doctor of Nursing Practice (DNP) degree program; the Center for Teaching and Learning, which has expertise in online pedagogy; and the ITS Audio Visual Systems Design team, which has expertise in the equipment, software, and installation.

The School of Nursing has been engaged in online teaching and learning for two years, and has just graduated its first cohort from their DNP program. The creation of the Learning Technology Studio will significantly improve the ease and quality of production for faculty teaching in the program.

Simplicity and flexibility were key design principals. Faculty will be able to get started using the studio after one quick training session, particularly if they are familiar with the software they intend to use. The Studio is designed to support both real-time and asynchronous online teaching, and a variety of recording or live production scenarios. The studio can accommodate webcasting and the creation of Windows-based content such as screen capture, voice, and video recording. Available equipment includes:

- Single seated or standing workstation with an easily adjusted hydraulic lift table
- Three roller-installed backdrops: Yale Nursing School brand, Yale Blue, and green screen
- Sound deadening panels for higher quality audio
- "On-air" light to help with exterior noise
- Three-point video lighting
- Teaching PC with Adobe Captivate, Camtasia Studio, and ECHO360 Personal capture installed
- Large Wacom annotation tablet
- Display mounted webcam for single-instructor video
- Tripod mounted camera, boom mic, and two lavaliere microphones for two-shot interview style recording

A video feature accompanying this article is available online:
http://fy15.itsannualreport.yale.edu/teaching-learning-research/av-group-installs-learning-technology-studio-school-nursing

### Yale Joins Coalition in Connecticut BioCompute Proposal

Yale University has partnered with the State of Connecticut, the Jackson Laboratory for Genomic Medicine, the University of Connecticut (UConn), and the UConn Health Center to propose the creation of the Connecticut BioCompute (CBC) initiative.

This next-generation data-centric computing resource will combine the intellectual strengths of the participating institutions in a shared organization that will provide collective capabilities for life sciences research and industry engagement that are not individually practical or possible.

CBC has the potential to serve as a forum for information sharing and collaboration on next generation computing techniques.

—Kiran Keshav
Senior Director
Research Technologies
Teaching, Learning, & Research

ITS Creates Computer Kiosks for Mental Health Program

Yale School of Medicine designated IT support providers (DSPs) played a key role in the creation of innovative computer kiosk hubs that will deliver mental health and family economic success services as part of the pioneering New Haven Mental Health Outreach for Mothers (MOMS) partnership.

The MOMS partnership is a collaboration of agencies that work together to support the well-being of New Haven mothers and families. The partnership’s mission—to provide mental health assistance to mothers and children through community, and neighborhood-based resources—is supported by a $3.7 million grant from the U.S. Department of Health and Human Services.

YSM’s Dr. Megan Smith and Joanne Simiola approached the Psychiatry Department’s DSP for guidance and technical expertise in the grant-submission and project-planning process. The project included the creation of four solution centers called “hubs” within strategic sites in disadvantaged New Haven communities. Each hub will be outfitted with 9-12 kiosk computers.

The DSPs collaborated closely with the engineering and information security departments within ITS to develop a kiosk computer that is both easy to use and secure. They also worked with the Network team to establish internet connectivity at the different hubs.

The biggest challenge the technical teams faced was to set up the system to allow remote maintenance and support to ensure the computers are always available to program participants.

Currently, there are four functioning hubs. If the MOMS program is successful in New Haven, the U.S. Department of Health and Human Services will explore expanding the program nationwide.

ITS Hosts Yale Technology Summit for Community

In 2014, ITS partnered with leaders and organizations across Yale to develop the Yale Technology Summit, an exciting new event for students, faculty, and staff. The first Yale Tech Summit took place on Friday, October 31, 2014, at the School of Management’s Evans Hall.

The summit provided an opportunity for individuals and groups in the Yale community to demonstrate innovative uses of or ideas about technology in their work. The call for presentations generated 50 submissions from students, faculty, and staff. More than 400 people attended the inaugural event, which featured Yale alumni Justin Kan and Emmett Shear, co-founders of the billion-dollar online gaming platform Twitch, as the keynote speakers.

The success of this event confirmed a growing interest in dialogue about technology in teaching, learning, research, and entrepreneurship at Yale and beyond. ITS is committed to producing this event every year.
Student Developers Improve Yale Mobile App

With the support of the ITS Student Developer & Mentorship Program, Yale students rebuilt the Yale mobile application. The new and improved app included a photo feed from Yale's Instagram channel, an improved maps search, and bug fixes to the events calendar.

The students were divided into Android and iOS teams, each with a student technical lead. Utilizing their skills in math, computer science, cognitive science, history, and engineering, the teams gathered requirements, developed, tested, and released enhanced versions of the app in a single semester.

Available for Apple and Android devices, the Yale app helps users stay informed of campus news, events, videos, photos and more, including timely events such as commencement or orientation. A video feature accompanying this article is available online: http://fy15.itsannualreport.yale.edu/teaching-learning-research/student-developers-improve-yale-mobile-app

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The Student Developer Program has given me an inside look at the software development process, and it has made me think more critically about the technology around me.

—Stan Swidwinski
Student Developer
Trumbull '17

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Yale Center for Research Computing Established

In Fiscal Year 2015, Yale established the Yale Center for Research Computing (YCRC), a component of the Provost’s Office that reports jointly to the Deputy Provost for Science & Technology, the Deputy Dean for Academic & Scientific Affairs at the Yale School of Medicine, and the Chief Information Officer.

The Yale Center for Research Computing works to advance research at Yale by administering a sustainable state-of-the-art computational infrastructure, providing technology services, and facilitating an interdisciplinary approach to the development and application of advanced computing and data processing technology throughout the research community.

The center provides a home for computationally intensive activities across a panoply of disciplines, from digital humanities to astronomy, genomics and biomedical imaging, and from architecture to engineering and quantum physics.

A member of ITS serves as YCRC’s executive director, working closely with faculty, research support staff, and the High Performance Computing team.

To learn more about the Yale Center for Research Computing, visit research.computing.yale.edu.

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The Yale Center for Research Computing seeks to advance research excellence throughout the University by providing a home for computationally intensive research across a panoply of disciplines.

—Steve Girvin
Deputy Provost for Science & Technology
Eugene Higgins Professor of Physics & Applied Physics

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The creation of the YCRC is a great step forward for all involved in research computing at Yale. The Center will engage academic departments, research cores, and individual faculty members to assess needs and contribute actively to the development of research plans and projects at Yale.

—Carolyn Slayman
Deputy Dean for Academic & Scientific Affairs
Sterling Professor of Genetics and Professor of Cellular and Molecular Physiology

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Yale Film Study Center Shares Its Treasures, Acquires Historical Collection

In June 2014, the Yale Film Study Center launched a monthly “Treasures from the Yale Film Archive” series. Held in the Whitney Humanities Center, the series highlighted gems from the Center’s collection of more than 5,000 35mm and 16mm film prints. Large, enthusiastic crowds experienced a wide variety of movies, including “Three Kings,” “Pan’s Labyrinth,” “Fantastic Mr. Fox,” “The Piano,” “Much Ado About Nothing,” and “The Lady From Shanghai.”

Special events included a 50th anniversary screening of “Nothing But a Man,” Yale Professor Michael Roemer’s groundbreaking drama about a black couple’s search for dignity in the South; and a gala celebration of Yale Bowl’s centenary that included a screening of the first feature film shot in the Bowl, the silent comedy “Hold ‘Em Yale,” presented with live musical accompaniment.

“Treasures from the Yale Film Archive” is made possible by the generous support of Yale Corporation Member Paul L. Joskow, ’70 M.Phil., ’72 Ph.D, who shares our dedication to presenting Yale’s archive to the Yale community and the public.

In FY15, the Yale Film Study Center received a donation of more than 500 16mm prints, ranging from newsreels, travelogues, and musical performances to novelty shorts, industrial films, interviews, and advertisements. The prints are part of the collection of legendary film collector Herb Graff (1926-2000).

This collection is a unique and fascinating assortment of material that tells the story of the first half of the 20th century, from major events and political figures to the strange and wonderful people and places otherwise lost to history. In its variety, it also demonstrates the value of film collections to a whole range of disciplines of study. For scholars, film fans, and history buffs, the collection is a treasure trove of material that is difficult, if not impossible, to find anywhere else.

A video feature accompanying this article is available online: http://fy15.itsannualreport.yale.edu/teaching-learning-research/yale-film-study-center-shares-its-treasures-acquires-historical
From Red Tape to Self-Service: A New Service Model for Business Intelligence

Not a lot has changed in the 14 years I’ve been working with reports at Yale. When I came to Yale in 2001, I was hired by a finance department to develop reports because they were tired of going through the red tape of using ITS for report development. It had become too expensive to get new reports from IT. First, they had to come up with the funding, then formalize the report in the form of a functional specification, go to a lot of meetings, and then hope they would have a report in a year or so.

I was charged with helping them get the reports that they needed more quickly and less expensively. I worked with great people who knew what they wanted the reports to look like but we were not sure where to get the data, which tables or views to use, and whether we were choosing the right fields. And we didn’t know where to get help with building the reports or learning the tools we should use to develop the reports.

The Challenges Continue

Many years later, the problem still exists. We get calls asking for help with Brio, or with questions about the data, but with limited resources that are dedicated to various projects, we are not able to assist functional users as much as we would like. We haven’t expanded our data warehouse beyond the functional areas we served when I started: Our strongest data knowledge is still Finance, HR, and Procurement.

Conventional thought is that report development at Yale is expensive and, if funding is approved, will take a long time. It became clear that we needed a new service model that empowers the functional users to develop their own reports.

I’m now in the position of looking back to where I started and trying to find a way to address the pain points so reports can be developed more quickly, at less cost, while still being secure and reliable.

Collaborating on a Solution

Data & Decision Support Services is working toward a new vision: “A reporting and analytics environment across Yale’s administrative area that is easily accessible to the community, and trusted for decision making.” With an emphasis on community and trust, our team will be focused on working together with our functional counterparts. We will be a support organization that goes beyond developing and distributing operational reports. We are here to assist others and to provide them with the tools, training, data, and services they need to get their jobs done.

Data & Decision Support Services will identify new reporting tools, encourage others to use them, and we will provide the infrastructure to support them. An example of this is our selection of Tableau as a business intelligence tool that helps people visualize their data in new and different ways. We have encouraged people outside of ITS to use the tool by helping them get licenses, establishing a community of practice, writing a newsletter, and holding introductory presentations. People can develop reports and use our servers to host them so others in their department can see them. This is a great shift toward encouraging decentralized reporting and setting up services that support it.

Ensuring Quality Reporting

Good decentralized reporting is nothing without good data and governance. We will work with department data stewards to ensure that the data we help them provide is accurate, reusable, consistent, and secure. Collaboration between us and the business community is imperative to our success, so we are identifying key business systems, and building relationships with the people who understand the data so we can give users what they need. This gives us the chance to provide people with access to systems beyond just Finance, HR, and Procurement.

I am excited and proud that we are moving in the right direction by acknowledging the needs that have existed for years, and addressing them head on. We won’t get there overnight but we’re on track. By remaining committed to our vision, we can say goodbye to the long development cycles, huge investments, and the red tape of yesteryear.
Administration

Effort Underway to Streamline University Training Requirements

The ITS Medicine & University IT Partners team has been assisting the Provost’s Office with a comprehensive review of the policies, procedures, and processes related to university-wide requirements, with the primary objective of creating a university policy that clearly articulates the university’s expectations regarding requirements for faculty, staff, and, where appropriate, students and visitors; describes roles and responsibilities; outlines compliance enforcement procedures; and establishes a high-level oversight body.

Another objective has been to complete a comprehensive characterization of the existing and desired compliance environment, including the role of tools such as the Training Management System (TMS).

The team collaborated with community to identify existing barriers to compliance and the recommended means to mitigate these barriers. This has been an extensive effort involving discussions with department and school administrative leaders and the units responsible for the requirements.

Approximately 20 requirement owners reviewed 114 active requirements with 3,077 related courses, resulting in the elimination of nonessential requirements. In the end, the total number of university-wide requirements was reduced to less than 50. At this point in time, there are approximately 15,000 faculty and staff with roughly 130,000 active university-wide requirements.

The next phase of the project will focus on community-facing mechanisms, reports, and tools.

Access to Alumni and Donor Data Improved

Donor and Alumni Relations Constituents at Yale, known as DARCY, is the University’s system for managing Yale’s donor and alumni data for development and alumni-relations activities across campus. Over the past year, access to data and reporting options expanded to deliver mission critical information to the DARCY users.

DARCY’s accompanying data warehouse launched in early FY15, and included comprehensive pre-built reports and access to information not available previously. The DARCY Gift Report, a multifaceted information delivery system designed to navigate the complexities of donation management, launched in December 2014 and provides individualized reporting capabilities to each unit within the Office of Development.

Data Governance Balances Priorities, Risk

Data Governance is an institutional approach to the orchestration of people, process, technology and information to enable Yale to optimize, protect and leverage data.

Data Governance is not new to Yale; various policies, procedures, roles and definitions are already in place. What is new is recognizing that the increased demand for data is necessitating a shift in data governance from largely a risk mitigation activity to one that balances opportunity and risk. The changing environment requires a deliberate institutional approach that takes into consideration academic priorities, administrative priorities, and risk management.

ITS has developed a framework and a blended approach of institutional oversight, engagement through existing governance structures, and a focus on specific use cases. Working with staff from ITS Business Systems Group and Information Security Policy & Compliance (ISPC), the Office of the Chief Technology Officer developed a data governance framework that has been well received by Office of the Provost, the Library, and leadership in Finance and Business Operations.
Administration

ITS Decommissions Outdated Administrative Applications

The Yale Administrative Menu System (YAMS) and Oracle Instance Navigation Console (OINC) decommission project was completed in January 2015. YAMS and OINC were legacy applications accessible via a network drive.

The decommissioning process consisted of replacing the YAMS components with solutions that can exist outside of a network application. The OINC links were moved to a new CAS-protected webpage on Tech Connection.

The Yale Administrative Menu System (YAMS) was used to access BrioQuery and many other administrative applications and reporting systems at Yale. YAMS technology was not compatible with newer Windows operating systems.

OINC, formerly a stand-alone Windows application, provides shortcut access to production and test instances of many Yale administrative applications.

New Malpractice Insurance System Simplifies Processes

ITS Medicine & University IT Partners led a project with the ITS Business Systems Group to develop a new system for the School of Medicine that tracks malpractice insurance coverage and premiums for university clinicians.

The system automates and simplifies updates of coverage for physicians, as well as the tracking of premiums billing to the department level.

Improved Scanning, Dashboard Reduce Invoice Backlog

Seeking to stem the growing backlog of unpaid invoices, the Business Systems Group (BSG) has launched the Payment Process Initiative (PPI). The project includes an improved invoice scanning process that reduces turnaround time for invoices, many of which were being placed on hold for various reasons.

The invoice backlog was causing increased expense to the university, unnecessary rework, extensive exception processing, and had impeded the ability to stay current with incoming work.

The PPI was launched to alleviate that strain and minimize financial impacts. In addition to improved invoice scanning, the initiative features a dashboard of metrics for lead administrators and business operation managers to encourage departments to use the appropriate buy/pay approach, streamline invoice processing, and reduce related rework. The dashboard provides key invoice information in a format that enables the university to quickly identify and act on the root cause of invoice payment issues.

Implementation of the Payment Process Initiative (PPI) project has caused a reduction in the turnaround time and number of invoice holds as well as reduced the number of calls to the contact center.

—Erin Totz
Client Partner
ITS Research Enterprise
New Technologies Improving Search on Yale Websites

In August 2014, ITS Campus Community Technologies began exploring the current search landscape at Yale, including an assessment of available technologies and how they might be integrated with various Yale websites. Improving search functionality at Yale is a high priority of the ITS Web Technologies team and a critical piece of the web improvement initiative currently underway at Yale. Newer search technologies such as Google Custom Search (GCS), Google Search Solution (GSS), and Apache SOLR provide many advantages, including unlimited indexing, cloud self-management, the ability to promote websites based on keywords, and much more.

ITS has collaborated with the Office of Public Affairs & Communications (OPAC) to test the Google Custom Search (GCS) technology on the main Yale.edu web pages and the Yale Portal website, which both are now using the new technology, and returning dramatically improved top-level search results.

Tools Provide New Ways to Integrate, Visualize Data

A new data integration tool (Talend) that will save the university significant ongoing maintenance costs was evaluated and adopted to help us decommission the current tool. Infrastructure, Vendor Management, and the Business Systems Group (BSG) partnered on this effort and successfully made the transition.

A robust shared Tableau server environment was established to consolidate past silo implementations of Tableau across the campus. With no extra software license funding, the team successfully widened the Tableau user base from six groups to 18 groups within six months.

A comprehensive operating model was developed to support the platform, onboard new teams, and provide clarity on ownership. After the implementation of the shared Tableau environment, three applications went live in the new production environment, including solutions for the Office of Development, the President’s Office, and Procurement. Five Tableau proof-of-concept (POC) projects are in progress to help new users learn the new tool and its methodology.

Proactive Planning Improves System Reliability

In the university’s business and administration areas, when the system doesn’t work, people can’t get their work done. Unreliable systems make people unhappy, and cost the university time and money. ITS’s Business Systems Group (BSG) has focused on improving the reliability of systems by taking preventive measures and tackling issues.

Following are two examples.

- This year’s budgeting cycle using the Yale Budgeting Tool was much smoother than last year’s because of advance preparation, and the correction of many issues.
- For the Integrated Research Enterprise Solution (IRES), the grant proposal development and tracking system, BSG implemented additional monitoring and updated operational procedures to reduce the occurrence of issues and to speed up their resolution.

Recognizing the importance of keeping software current, BSG performed major upgrades of more than 10 systems in FY15.
Workday@Yale Launch Marks Transformational Change

Workday@Yale was launched university-wide on July 1, 2015, becoming Yale’s new system of record for human resources, payroll, and academic appointments. This is the first of several major releases that will be implemented over the course of the multiyear initiative. With each release, additional and improved functionality will be rolled out to the Yale community, including the release of Workday Financials in 2017.

The transition to Workday represents a significant advance from the university’s legacy systems, including Oracle E-business, a functionally rigid platform that was installed more than a dozen years ago. In contrast, Workday’s state-of-the-art cloud system provides the Yale community with the user-friendly tools needed to accomplish the administrative work of the university efficiently. Workday offers a host of benefits related to Yale’s administrative and business processes, including reduced paperwork, and improved access to information and data.

At a recent town hall meeting, Shauna King emphasized the significant impact Workday will have on Yale, saying, “Your very valuable hours will not be spent jumping administrative hurdles, navigating mazes, or filling out paperwork. Instead, your time will be focused on support, and will directly impact Yale’s mission of teaching, research, and patient care.”

The success of Workday’s implementation at Yale would not have been possible without the collaborative efforts of the Workday, Human Resources, Payroll, and Academic teams, including their units across campus. Looking ahead to future releases, the continued partnership with business units will be critical to the deployment of the best possible business solutions for Yale.

The Workday@Yale Program is a transformational change, not only from a technology perspective, but from a campus administrative services perspective. By unifying Yale’s distinct administrative and operational systems, Workday will help Yale meet its strategic goals as well as improve the level of service provided to the Yale community.

A video feature accompanying this article is available online: http://fy15.itsannualreport.yale.edu/administration/workdayyale-launch-marks-transformational-change

Shauna will retire from Yale in the Fall of 2015.
The Threat to Yale’s Data and the Security Measures We Are Taking

The Internet is not the collegial place it once was. The Internet’s founders saw its promise but did not foresee users attacking one another. Organizations need to adapt to the dynamic ways people and nation states misuse this ubiquitous resource.

Yale University is a unique leading center of learning, research, and clinical care. One might suppose that the noble nature of Yale’s mission and the contribution it makes to humanity would exempt it from nuisance and dedicated cyber-attacks. Unfortunately, Yale’s mission is not a deterrent to those who seek to harm our systems and acquire our data.

Attack Targets

Why would they attack us? Some organizations believe that because they are small or that they don’t hold substantial amounts of sensitive consumer data, such as credit cards or medical information, that they are unlikely to be victims of a cyber-attack.

In fact, cyber criminals target organizations of all sizes and from every industry, seeking anything that might have value, including:

- University plans, strategies, or acquisitions
- Investment algorithms
- Contracts with customers, vendors, or partners
- Employee login credentials
- Facilities and electrical generation information
- Pre-patent creative work
- Software source code
- Student and patient data

ITS has enhanced security over the last few years by making changes to the core technologies of the university. We worked to encourage the community to follow Yale IT policies, which are designed to foster regulatory compliance and information security basic due care. In this way, we can lower the probability of data being stolen or corrupted by external parties. We have also promoted good encryption practices to protect data from accidental loss or theft.

We do these things with the belief that these actions will serve to protect the University’s ability to execute its core mission. Of course, we are mindful of situations in which security controls create obstacles for community, so we are always ready to design custom controls that provide some measure of protection.

Preventing Intrusions

One study found that four basic security controls were effective in preventing 85 percent of cyber intrusions:

- Restricting user installation of applications (called whitelisting)
- Ensuring that the operating system is patched with current updates
- Ensuring that software applications have current updates
- Restricting administrative privileges

Multifactor Authentication (MFA) is a technology we are providing right now to protect the individual system identities (NetIDs) of the entire community. We have seen phishing attacks and malware drive-by attacks that have compromised users in the past. This technology is very similar to what banks and credit card companies use to verify the identity of a person using their financial services. Users simply identify themselves through another means in addition to the traditional user ID and password. We have multiple authentication methods available.

Secure Box cloud storage is another offering we have designed that provides better protection for university data. The Secure Box service can only operate from the Yale Network on registered devices. It is the only cloud storage service that is permitted to be used with 3-lock data.

The greatest resource to help ITS information security, policy, and compliance is the excellent input from community members. We appreciate all of the helpful suggestions from all corners of the university.
Infrastructure

ITS Launches Portal for Yale Application Developers

ITS Campus Community Technologies has launched the Yale Developer Portal, a website that brings together tools and resources to help developers more easily write applications using Yale data. Available to all Yale developers with an active NetID and password, the portal hosts a collection of Application Programming Interfaces (APIs) that provide access to data from across campus. Data currently available include information on Yale buildings, Yale shuttle service, campus printers, dining, museums, even residence hall washers and dryers. The portal’s selection of APIs will continue to grow as additional data sources become available.

Making APIs available in a centralized location speeds up application development and encourages new and innovative uses of Yale data. The portal also allows Yale developers and data owners to share new APIs, manage versions, get feedback, and view usage data.

For users, the Yale Developer Portal is a place to connect with the developer community, find support, improve skills, and exchange ideas through forums, postings of classes and workshops, and information about “hack” spaces and events.

Yale Developer Portal features:
- Documentation on Yale APIs
- Application and API management
- Software development resources
- Forums fostering sharing and collaboration
- Announcements of events specifically for developers

Information Security Office Introduces Multifactor Authentication

In 2015, Yale introduced an additional security measure to protect the intellectual property, personal information, and data of students, faculty, and staff. Called Multifactor Authentication (MFA), the measure adds a step to the login process used for off-campus access to Yale’s network and resources.

Multifactor Authentication requires an off-campus user, after entering a NetID and password, to further prove his or her identity by responding to a prompt on a mobile device or landline.

Yale’s Office of Information Security has deemed Multifactor Authentication a necessary safeguard against unauthorized access to Yale’s data. Universities and colleges across the country increasingly are adopting this technology, which commonly is used by financial institutions to verify online users’ identities.

A video feature accompanying this article is available online: http://fy15.itsannualreport.yale.edu/infrastructure/information-security-office-introduces-multifactor-authentication

Targeted Attack Protection Reduces Email Phishing Attacks

To protect the user community from phishing attacks, the Information Security Office implemented the Targeted Attack Protection (TAP) module from Proofpoint. The module enables URL rewriting, a process that modifies web addresses (URLs) embedded in emails to provide protection against links that direct an unsuspecting email user to a malicious site.

Since the implementation of TAP in December 2004, the number of phishing attacks has fallen significantly and Yale has been able to maintain its email reputation scores with major internet service providers, thereby eliminating delays in the delivery of email.
Yale Joins Global WiFi Network for Higher Education

Yale has joined a consortium of higher education institutions that allows students, faculty, researchers, and staff to access a global WiFi network called eduroam (from “education roaming”) when visiting participating institutions.

Developed for the international research and education community, eduroam is available in more than 70 countries. The service saves time and frustration that can result from trying to connect to the internet when visiting a campus, or setting up access for a visitor from a partnering institution.

In April 2015, ITS Network Engineering worked with eduroam.us to rollout this WiFi service, adding the eduroam network to the WiFi network across the campus. Visitors use their user name and password from their home institution to connect to the network. Devices that remember WiFi network credentials will connect automatically when eduroam is available.

When a user tries to log on to the wireless network of an eduroam-enabled institution, the user’s authentication request is sent to the user’s home institution. This is done via a hierarchical system of RADIUS servers. The user’s home institution verifies the user’s credentials and sends the result to the visited institution.

It’s simple to connect: Join the eduroam WiFi network just as you would any other available WiFi network on your device. To log in, your user name is your Yale NetID (in the format netid@yale.edu) and the password is your NetID password.

Identity Data Repository Improves Security and Management of Crucial Data

The Identity and Access Management (IAM) team announced the availability of the Yale Identity Data Repository (IDR). The IDR provides one central and secure location for commonly accessed identity data across the student and human resource systems. Over time, the IDR will replace the People File and the Public Directory.

Benefits of the IDR include:

- A consistent, centralized process for requesting and gaining access to identity data, ensuring adherence to regulatory and privacy policies
- Master data management for identity data, leading to improved data quality
- Vetted identity and affiliation information.
- User attributes to enable attribute-based authorization (e.g. department, affiliation, job category)
- Simplification and enhancement of the university’s authentication and authorization infrastructure.

106,675 active people in IDR

58,449 records in the Public Directory

334 eduroam institutions in the US

74 Countries with eduroam
Future Charted for Identity and Access Management

As ITS completes the third year of modernizing our Identity and Access management systems, we have developed a three-year road map to continue to improve the University’s ability to support federated identities across research universities, and to continue to stabilize and secure our identity management infrastructure.

In the process, we identified new opportunities for group management across teaching and learning systems, and selected a foundational system. We also recommended the use of Multifactor Authentication to increase the security of our account management. Finally, we are a sponsor school for Internet2’s new Trust and Identity in Education and Research, a 50+ university consortium to develop shared tools and standards for identity management moving forward.

Managing Yale electronic identities and access to Yale systems is foundational to University operations. With significant care for the security of information and the privacy of our students, faculty, and staff, we continue to streamline and improve the management of identity credentials, and to automate access to computer systems.

A video feature accompanying this article is available online: http://fy15.itsannualreport.yale.edu/infrastructure/future-charted-identity-and-access-management

Desktop Support Team Encrypts 541 Computers in Short Timeframe

In Fall 2014, the Yale Information Security Office identified 541 machines that needed to be encrypted within an aggressive timeframe. Campus Technology Services’ Desktop Support group was engaged to evaluate the list and propose a method of accomplishing the encryption.

The proposal included estimates based on the time needed to remediate the condition of each machine (e.g., software repair, enabling encryption software, reimagining machines, replacing machines), as well as the procurement of new machines to replace those that were outdated.

The proposal took into account the results of a study of the most heavily affected departments to determine how many machines could be taken out of service at one time without negatively impacting the business functions of the department.

The project was approved with a compressed six-week timeline. As the team expected, client scheduling, record keeping, and escalations proved to be a greater challenge than fixing machines. Nonetheless, the plan worked as intended and the team met its deadline.

CrashPlan Brings Backup Technology Up to Date

To modernize ITS backup capabilities, ITS began deploying a new backup service in 2015. As part of this deployment, ITS converted more than 3,000 accounts with little to no impact on the individual enrolled in CrashPlan backup service.

The new service, called CrashPlan, brings many benefits, including:

- Data is backed up automatically, continuously, and silently with no user effort or intervention required. Previously, backups needed to be scheduled.
- You can backup and restore files from anywhere in the world. The old backup service required your computer to be on Yale’s network.
- CrashPlan enables users to quickly and easily restore data from a simple interface.

The old backup server was decommissioned on July 1, 2015. Moving forward, all new backup accounts will utilize CrashPlan.
As information technology continues to advance and transform the way we study, live, and work, technologies increasingly need to interoperate smoothly. We have come to expect rapid, easy, accurate interactions with systems and tools that know who we are and can quickly provide the information we need. As the devices and software have matured, we are now focusing progressively on the data that is foundational to interoperability and precision.

To more seamlessly move data among systems, ITS has launched university initiatives on Data and Decision Support, a Software Developers Portal to facilitate data integrations between systems, and proposed adoption of a Data Governance framework. Foundational to providing precise, timely data is the secure infrastructure that enables reusable integrations, and provides solid identity and access management. We have built the resilient and secure pipes and are now working to improve the quality, reusability, and timeliness of the data moving through the pipes.

**Mapping the Future**

To ensure our resources are applied strategically, we have adopted a rigorous Technology Lifecycle Management approach to optimizing the application and technology portfolio. All applications are assessed for how well they are meeting university needs, and how secure and strategic their underlying technology is. With quarterly trend reports, we are actively working to migrate off of and eliminate applications that are in need of replacement, and to consolidate on a more streamlined set of applications.

We have developed three-year road maps for our core technologies that will be widely shared across the university, permitting university functions to plan for consolidation and change. Notably, we are increasingly moving core university functions to resilient and high-performing cloud-based solutions such as Canvas, Workday, Box, Acquia, and Office 365.

**Leveraging New Technologies**

Technologists delight in tracking emerging technologies. ITS avidly is engaged with heavy users of 3D technologies on campus, notably the School of Architecture and the Center for Engineering Innovation and Design. Our partnership culminated in an invitation for several Yale faculty to a daylong discussion with Autodesk, a leader in 3D design, engineering and entertainment software, on the future of 3D technologies at universities.

We are engaged with peer universities and vendors in collaborative working groups on the Internet of Things and Data Analytics, working to understand trends and new technologies that will enable us to better serve the rapidly evolving and varied technology needs of the university and especially of faculty research. Our students can now use apps to find friends in the dining halls, and check for available washing machines, and prospective students can navigate the campus using an app that provides interactive undergraduate student guides. ITS offers a student developer and mentorship program and a variety of consultative services to help departments and labs obtain or improve websites and applications as the tide of technology use continues to surge.

**Keep Pace with Change**

The pace and diversity of the evolving IT landscape have never been so fast or so broad. A highly centralized, top-down approach to understanding this world will leave us all behind, so we spend a fair amount of time listening to understand the technologies faculty are using and how we can help. We host sessions with IT units around campus to share information and propose ideas for future services. We work with lead administrators to improve data access and streamline system onboarding. And we need to make information available continuously both to those we serve and within ITS so that our technology decisions are strategic, delivering on the promise of value and fit.
First Cohort Graduates from Early Career Development Program

The Early Career Development Program (ECDP), launched by Yale ITS in 2013, is an entry-level career track program for recent college graduates interested in working in an information technology organization.

This year, the program was renamed to honor Brian J. Wolson, a member of the Yale ITS family who was admired and respected for his leadership, dedication, and enthusiasm. Brian served as Associate CIO for the ITS Shared Solutions group and spent six years leading development teams for the organization. He was an enthusiastic supporter of the ECDP. Brian passed away in July 2014.

In February of 2015, with Annette Wolson, Brian’s wife, in attendance, the first four program participants graduated and the ECDP was officially renamed The Brian J. Wolson Early Career Development Program.

This program offers participants opportunities to have a direct impact on technology at Yale by contributing to the development and support of Yale’s IT services.

ITS Help Desk Earns Industry Certification

All of the technicians on the ITS Help Desk are CompTIA A+ certified. The Computing Technology Industry Association (CompTIA) is a nonprofit industry organization offering certifications that affirm knowledge in a variety of technical competencies.

A+ certification is a foundational certification for information technologies. It covers mobile, tablets, laptops, desktops, and beyond. The exam verifies an individual can troubleshoot networking and security issues within Windows, Mac, and iOS.

The ITS Help Desk’s achievement ensures the Yale community receives consistent, knowledgeable support.
ITS Bolsters Support of Schools of Medicine, Public Health, Nursing

ITS is expanding and enhancing the way it supports the School of Medicine, School of Nursing, and School of Public Health at Yale.

ITS Medicine & University IT Partners team collaborated with the ITS Help Desk, Distributed Support Providers (DSPs), and Endpoint Engineering teams and their counterparts at Yale-New Haven Hospital (YNHH) ITS to coordinate efforts in supporting the clinical departments at the School of Medicine. Achievements include a defined process for forwarding calls between the ITS and School of Medicine help desks, and providing bilateral authority for our support techs to access and configure workstations to each other’s standards.

At the Yale School Nursing, ITS Medicine & University IT Partners and the associate dean are exploring strategies to optimize the support from ITS designated service providers (DSPs), and School of Nursing IT and audio-visual staff. A member of the Medicine & University IT Partner team is spending one day per week onsite to help this effort and to provide walk-in consultation.

ITS has been working closely with selected faculty and staff at the Yale School of Public Health to develop a review of IT requirements and recommendations for the school, and the formation of a permanent IT steering group.

ITS Photo & Imaging Adds Video Production to ITS Services

ITS Photo & Imaging provided extensive support for the creation of videos for ITS, a new service offering from ITS Photo & Imaging. Projects included location shooting and post production work for the Unified Messaging, ITS leadership, Women in IT (WIT@Yale) shared interest group, Workday@Yale, and Multi-factor authentication.

John Guidone from Information Security, Policy, and Compliance addresses a group of IT Partners about secure computing training efforts.

ITS Connects With IT Partners at Community Meetings

The Medicine & University IT Partners group within ITS has continued its formal outreach to distributed university IT staff through three primary venues: IT Professionals Plus, Med IT Partners, and Friday Forums.

These provide a regular opportunity for ITS to inform and include them in developing issues, to hear what issues they are facing, and to discuss mutual issues with their non-ITS colleagues. Discussion topics this year included data governance, secure cloud storage, HIPAA policy updates, change management, and many others.

ITS Photo & Imaging and Organizational Change Management staff members work on the set of the Workday @ Yale Sponsorship Video.

ITS has been an invaluable partner for VSN, especially over the past two years. We have an embedded DSP that has worked closely with us on both short-term and long-term strategy for our desktop and personal devices. Our partnership with ITS has led to the joint development of a learning studio here at West Campus that will provide our faculty with cutting edge technology to enhance the learning experience for our students. Additionally, their expertise in Audio/Visual technology has been key for us as we settle into our new building and expand our research and simulation efforts.

—Christopher Farmer
Associate Dean for Finance & Administration
Yale School of Nursing
Technology Architecture Committee Keeps Watch Over Technical Design

The Technology Architecture Committee (TAC) governs the technical architecture of campus applications and systems. The TAC has broad representation from technical groups across the University.

This year, the TAC reviewed the following technical designs:

- Network Redesign
- Unified Communications
- Software Library
- Multifactor Authentication
- Better People Search
- Integration Strategy
- Technology Lifecycle Management
- Banner XE Student Information System
- Security Information
- Event Management
- Archival Storage
- F5 Global Traffic Manager
- Software Defined Networking
- Federated Identity

The TAC governs the technical architecture of campus applications and systems. TAC members from left to right, front row: John Coleman, Vincent Massaro, Susan Kelley. Back row: Nican-dro Nocerino, Andrew Newman, Philip Rinehart, Louis King, Lec Maj, Moleek Saxon, Adriana Corona, Loriann Seluga, Raymond Frohlich, and Kenneth Dwyer.

- Force.com Architecture Strategy
- Workday People Dimension
- Yale.edu Redesign
- Web Strategy
- High Performance Computing Architecture
- Next Generation Learning Stack

TAC review ensures secure, high-performing technical designs with broad awareness and understanding of technical dependencies and interactions.

Strengthened Governance Improves Service Awareness and Delivery

Over the last several years, ITS has evolved into a service-based organization. Whether it’s an upgraded website, support for classroom technology, or a new application to support teaching, ITS’s interactions with the Yale community largely consists of delivering services.

Last year, we relaunched the ITS Service Board and focused on how best to define, organize, and evolve our services. Many ITS team members collaborated on reorganizing our services so the community could most easily find and understand them. We created a three-tiered classification consisting of Service Groups, Services, and Service Offerings. The Service Offerings are what members of the community receive (i.e. the website, support, or new application).

The new structure allows ITS to more easily identify the cost of its services, provide continuous improvement on worthwhile services, and ensure services that are at end of life are removed for cost savings.

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<thead>
<tr>
<th>Service Groups</th>
<th>12</th>
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<tbody>
<tr>
<td>Services</td>
<td>95</td>
</tr>
<tr>
<td>Service Offerings</td>
<td>241</td>
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</table>
Web Teams Work to Update, Improve Campus Websites

Over past year, ITS Campus Community Technologies (CCT) Web Technologies group has been hard at work improving the Drupal-based YaleSites website environment, providing analytics, migrating legacy websites, and leveraging data reusability as part of their ongoing web strategy efforts.

Web Technologies announced a new service – Web and Mobile Analytics – guided by dedicated and certified ITS staff members. Analytics were added to legacy Drupal sites and mobile applications to better understand usage.

The group worked with various campus units to identify more than 550 outdated websites, and to migrate more than 50 static legacy sites to YaleSites.

Web Technologies also identified most-needed reusable data, and worked with owners to make campus buildings, events, and finalizing courses available through the Yale Developer’s API Portal. Other platform improvements include LabSites, a feature allowing laboratory managers to utilize new templates to build lab websites; and Quizzing, which facilitates the creation of content and quizzes for various types of assessments and synchronizes results with Yale’s Training Management System (TMS).

User Experience & Web Services provided agency-style web project services for a number of clients, including Digital Humanities, the Center for Research Computing, and the Center for Teaching & Learning. The team consulted with Office of International Affairs, Yale College, Resource Office on Disabilities, and many other Yale units.

In the current fiscal year, work will continue on migrating legacy sites, further improving YaleSites, and expanding project services to provide technically superb and user-friendly websites on the YaleSites platform.

Technology Lifecycle Management Approach Maximizes Efficiency

Striving to reduce redundancies, improve functionality, and ensure the stability and security of our technology future, ITS assessed platforms, infrastructure technologies, and applications across all units, and developed road maps for all core technologies. The result is a standardized approach for Technology Lifecycle Management.

Components were evaluated for how well they are meeting university needs and for the viability of their technical architecture. With all elements of the broad application and technology portfolio categorized as either “invest,” “sustain,” “migrate,” or “eliminate,” planning is now underway to develop migration plans and consolidate applications.

“Technology Lifecycle Management (TLM) is an approach to optimizing our application and technology portfolio,” said Susan Kelley, Yale’s Chief Technology Officer. “With TLM, we will drive simplification and cost savings while better meeting the needs of faculty, students, and staff.”

Technology Lifecycle Management (TLM) is an approach to optimizing our application and technology portfolio. With TLM, we will drive simplification and cost savings while better meeting the needs of faculty, students, and staff.

—Susan Kelley
Chief Technology Officer
Yale University
Reverse Auctions with Vendors Result in Big Savings

ITS, in conjunction with Procurement, has been leveraging a “reverse auction” process in which vendors offering a particular commodity underbid each other in a live online auction to win Yale’s business.

This year, the process had two significant wins. First, we were able to stay with our current server vendor at a 40 percent discount over what we had been paying.

In the second instance, the potential use of a reverse auction and related potential loss of business allowed us to secure an 80 percent discount with our current storage vendor. This was about $1.5 million less than the next closest competitor and that cost that had been budgeted for the project.

Yale Technology Survey Provides Data to Help ITS Serve Community

ITS is committed to the satisfaction of Yale faculty, staff, and students. To better understand the wants and needs of the individuals, departments, and organizations we serve, ITS launched the Yale Technology Survey in 2013 in partnership with the Professional Schools and the University Library.

The Yale Technology Survey is conducted every two years, and in 2015, it was delivered to a random sampling of faculty, students, and staff. The survey received a 41 percent response rate, a significant jump from the 21 percent response to the census survey in 2013. The nature of the survey allowed for a detailed understanding of the specific needs of the community.

Survey results help shape the future of technology at Yale, as the data are used in making key technology-related decisions. Results and action plans for improving our services are available to the public on the ITS website.
Keeping the Data Flowing: The Integration Competency Center

To address the anticipated explosion in numbers of disparate applications at Yale that need to interact and share data, Yale ITS has been building an Integration Competency Center (ICC). The ICC offers application developers across campus a unified platform for managed API access. An API (or application programming interface) is a set of routines, protocols, and tools that help applications work together and facilitate data sharing.

ICC’s Beginnings

Yale ITS’s ICC was established in October 2013, merging several smaller teams that had been pursuing separate departmental single-technology point-to-point integration solutions. As it worked to meet typical needs to integrate back-office applications, the ICC team began to experience a surge in requests for mission-critical integration work supporting university research, teaching, and learning activities. We also identified a need for data sharing and integration among applications supporting dining halls, theaters, athletic facilities, alumni giving, and more. Because Yale had not adopted a Service-Oriented Architecture back when many industries began to do so, the university was awash in point-to-point integrations, and lacked overarching management of the integrations and the data being passed.

In addition to providing a technical platform for integration, the ICC offers the people, training, onboarding, and delivery-model agility to meet the integration needs of everyone at every scale in the university, from giant ERP projects with hundreds of interfaces, to a single student entrepreneur/developer working on her idea for a new mobile app.

A helpful metaphor is to think of the ICC as a water utility that is responsible for both engineering and maintaining a quality water distribution system (pipes, valves, and meters) as well as assuring the quality of the water in and out of the system. The function is critical and requires a high degree of centralized specialized competency, and yet, when functioning properly, it is simply there when needed by end users.

How the ICC Works

Internal IT projects with integration needs engage the ICC to guide them through the process of characterizing their integration requirements and technical constraints. Once these are defined, the ICC identifies appropriate data sources and integration patterns along with any existing integrations or templates that can be leveraged. The ICC then works with the project team to build the integrations, sometimes using ICC-assigned resources, but more often by training and enabling developers to create their own integrations. The integrations are built to common standards and are deployed to an enterprise-class platform, ensuring consistency of performance, support, security, and integrity.

For external development initiatives, members of the Yale community (faculty, students, researchers, and staff) who independently want to develop apps that require access to university data can visit the ICC’s API Portal to explore and test available API calls. If they do not find an API that meets their needs, the ICC will work with data stewards to secure appropriate permission to use the data, and to define reusable API calls to deliver the requested data. Applications and developers requesting access to regulated or sensitive data are subject to a governance process and a security review of the application.

While we do broker discussions around data quality, for now the ICC is reliant upon data stewards for the sourcing applications to deliver quality data. As the university examines and refines its data governance policies, the ICC looks forward to expanding its ability to serve the community.
New & Improved Services

NEW SERVICES

- Treasures from Yale Film Archive
- School of Nursing Learning Technology Studio
- Computer kiosks for Mental Health Program
- Yale Center for Research Computing (YCRC) established
- Video Production
- Multifactor authentication
- Portal for Yale application developers
- Crashplan backup service
- eduroam Internet connectivity
- Targeted Attack Protection (TAP)
- DARCY’s supporting data warehouse launched
- Workday@Yale HR and Payroll launched
- Improved search functionality on Yale websites
- 3D Printing & Design Services
- Mobile Events Management
- Service Management Consultation and ServiceNow
- Web Strategy
- Technology Lifecycle Management
- Identity Data Repository

IMPROVED SERVICES

- Rebuilt Yale mobile application
- Help Desk Staff is CompTIA A+ certified
- YaleSites improvements including analytics
- Increased efforts to encrypt laptops
- Improvements in management of identity credentials
- Proactive planning for business system reliability
- Second venue for digital cinema projection added
- Usability & Accessibility Service expanded
- ServiceNow reimplementation
- Facilities Mobile Work Force enhanced
- Storage@Yale replacing RSS and CFS
To improve customer satisfaction and celebrate the hard work of ITS staff members, Len Peters, University CIO and Associate Vice President, created the CIO Spot Awards. This distinction recognizes those who are “spotted” delivering world-class service or going beyond the call of duty.

The program awards ITS staff members who deliver such high-quality service to the Yale community that it creates a profound sense of gratitude for that service in the community member or members receiving service. Hall of Fame honorees are staff members who have received Spot Awards multiple times and continue to demonstrate an exceptional level of high-quality service.

Nominations are accepted from all members of the university community. To nominate an ITS staff member, visit the CIO Spot Awards web page.