DoIT

ANNUAL REPORT

2018/2019

Technology and information are strategic assets of a 21st century university, allowing us to reach a broad set of learners and sustain an engaged and personalized learning environment. Innovative advances in smart technology and artificial intelligence are enabling cutting edge research at a scale never before achieved. Information is driving business insights and efficiency, allowing for strategic decision-making that improves effectiveness and propels our progress toward achieving university goals. In this highly dynamic environment, we are energized by the challenge of delivering a useful, contemporary technology experience to the learners and employees of the university. We are vigilant in protecting the university against the growing number of cyberthreats.

LOIS BROOKS

Chief Information Officer and Vice Provost for Information Technology

The Division of Information Technology (DoIT) has a considerable record of achievement over the past year, delivering core infrastructure at scale, keeping cyberthreats at bay, and partnering with others to provide faculty, staff and students with high quality, innovative technology and services that meet their needs. It is my privilege to offer this report of the accomplishments of the Division of Information Technology over the past year. The achievements recorded here are made possible by the talented and professional team of engineers, analysts, communicators, consultants and managers who have worked together and within the university community to deliver outstanding services and successfully complete projects. I extend thanks to the team and kudos for work well done.

Technology does not stand still, and neither will we. DoIT is undergoing a transformation, optimizing our processes and technology, learning new skills, embracing initiatives that directly align to university priorities and support the mission. We are positioning ourselves for the opportunities and challenges that lie ahead.

DoIT OVERVIEW

As the primary university IT provider, the Division of Information Technology (DoIT) provides services and technologies to support UW–Madison's research, teaching and learning, and business initiatives. The division is newly organized into three areas of focus: University Mission, Strategic Operations and Core Services. The DoIT organizational chart in the Appendix provides more detail.

TRANSFORMING DoIT

Technology and information are strategic assets of the University of Wisconsin–Madison. They extend and amplify great teaching and personalized learning, drive cutting-edge research, enable widespread engagement in communities and with partners, and lower costs through efficiency and automation. Underpinning every activity at the university, it is essential that the technology services match the quality of its education, research and outreach. To accomplish this, the Division of Information Technology (DoIT) is undergoing a transformation.

The university is growing and developing new programs, which, in addition to a heightened focus on big data, cybersecurity and user experience, demand improved IT services and infrastructure.

The decentralized structure of the university has historically made coordination and capturing scales of economy difficult, and within DoIT, complexity, insufficient planning, and uneven service delivery led to misalignment with university priorities and missed opportunities for coordination and progress.

We have strategically addressed these issues through planned improvements and adoption of standards to better meet the university's needs. In addition, we are leveraging partnerships, new technologies and innovative approaches to deliver an excellent, sustainable and secure tech environment that will support UW–Madison's academic, research, engagement and business activities.

Principles for Transformation

New Technologies and Approaches

- Work collaboratively with university partners to support their goals and achieve shared success.
- Use cloud services to capture scale economy and leverage innovation in the marketplace.
- Leverage platforms that offer wide utility for university functions with a focused investment, including Salesforce, Canvas, storage and computational services.
- Automate to drive efficiency, eliminate variability and error.
- Design for a contemporary user experience.

Fiscal and Human Management

- Determine investment for managing risk and creating value; benchmark and assess.
- Invest in people and create a pipeline of needed talent through professional development and project opportunities.
- Assess projects and investments as they relate to meeting university needs and/or capturing future savings.
- Use flexible staffing models to promote retention and efficiency.

Operational Excellence

- Shift resources into supporting the university mission and to align with university priorities.
- Drive cohesiveness, robustness and security of core operations.
- Use professional IT processes for consistency and quality.

Organizing Along Areas of Focus

Encompassing the extensiveness of the DoIT portfolio, the division's newly formed three areas of focus better align our services and technologies to support the university's research, teaching and learning, and business initiatives.

1. University Mission

Foundational to the university's teaching, research and outreach mission, DoIT provides:

- Instructional and analytics tools and services to help strategize, design, develop and integrate technologies that improve learning outcomes.
- Research cyberinfrastructure to support the technical capabilities needed for research, including physical and cloud-based storage, services and tools.
- Services and technologies for enterprise business functions for both UW–Madison and UW System such as business analysis, application design, programming, integration, system provisioning, and project management.

2. Strategic Operations

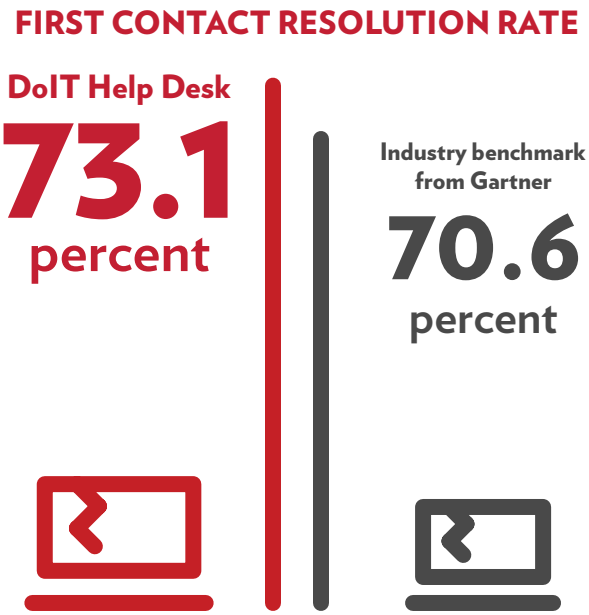
The enterprise operation of the division and university IT includes:

- Strategic assessment, direction and integration of technologies including cloud strategies, enterprise architecture, investment priorities and university-wide optimization.
- Management of the reduction of cybersecurity risk through strategies like appropriate handling of data, continued assessment, diagnostics, and processes and procedures to handle intellectual property and other sensitive information.
- Governance coordination, fiscal and human resource management, communications and project management.

3. Core Services

Forming the backbone of all university technology operations, this area provides:

- Productivity platforms such as email, calendar, chat, portal, enterprise content management, document storage and collaboration, and web content management.
- Internet and research network connectivity, life safety systems, wireless network, remote access systems, cable TV services, telephony and messaging services.
- Infrastructure and operations including data center management, physical and virtual hosting, storage, backup, and database infrastructure.
- Interoperability and identity management services.
- Help desk user support, computer repair, technology-use consulting, departmental support and educationally discounted software.
- Digital media and a wide range of printing services for the university.

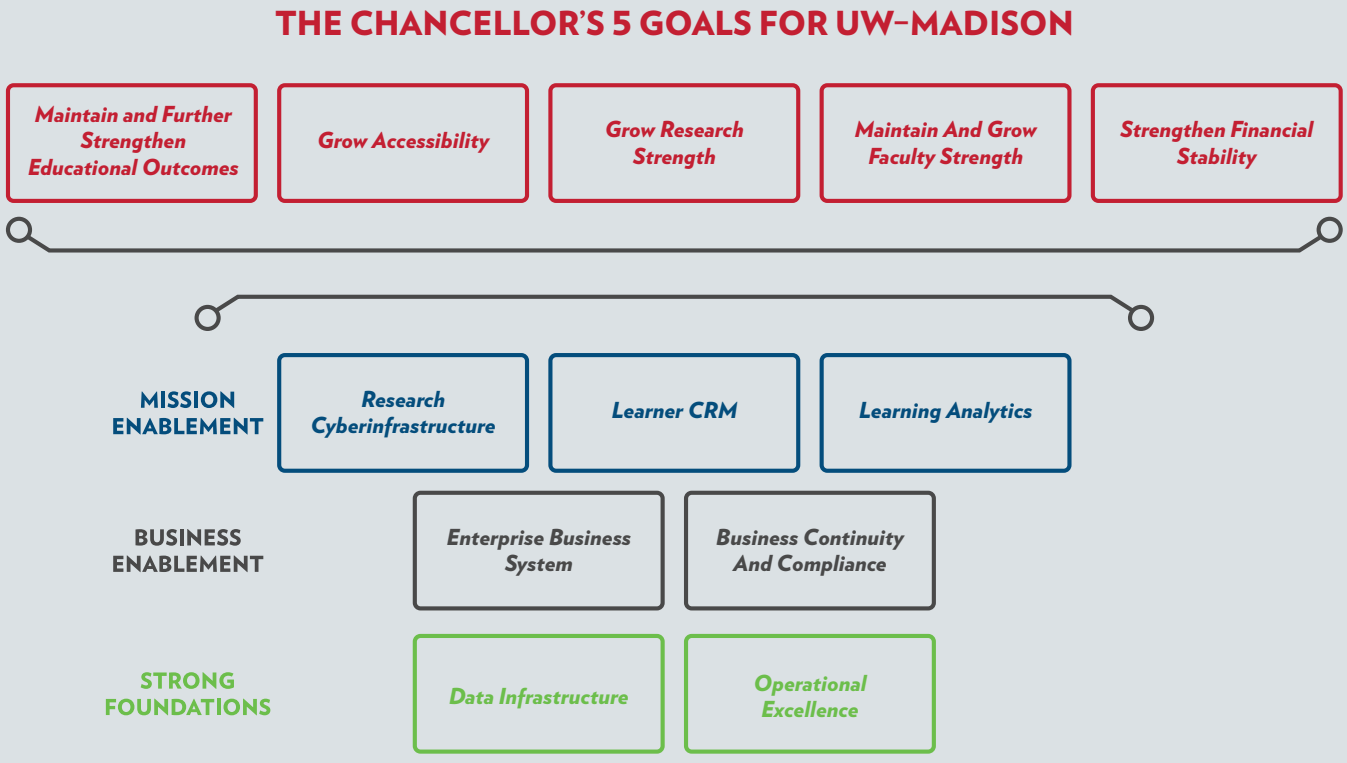


Strategic Initiatives

Through extensive engagement with university leadership, IT governance and partners, as well as assessment of higher education innovation and best practices, DoIT has identified priorities for strategic investment in technology and services:

- Research cyberinfrastructure
- Learner constituent relationship management (CRM)
- Learning analytics
- Enterprise business systems
- Business continuity & compliance
- Data infrastructure

Each of these initiatives represents the groundwork for a multiyear, strategic move to support university priorities and the Chancellor's five goals for UW–Madison.



Each Strategic Initiative supports the next level of IT and all support UW–Madison's goals.

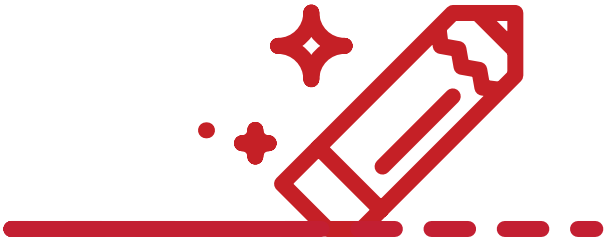
Business Efficiencies

BUDGET TRANSFORMATION

240,000

transactions eliminated

from the general ledger



DoIT Budget Transformation

Beginning with the FY20 budget, DoIT will use a standardized internal budget allocation model and eliminate the DoIT-only internal chargeback system. This will improve our ability to accurately assess the cost of services, strategically allocate resources, eliminate complexity, and prepare DoIT for the transition to the university's new enterprise finance system.

New ways of working: Agile, DevOps and Lean

To improve the quality of IT services and to respond to the rapid rate of change in technology, DoIT is fully adopting more modern practices such as Agile, DevOps, and Lean. These practices, and their associated cultural changes, will allow DoIT staff and services to respond and adapt quickly to continuously evolving university needs.

Learning Organization

Learning is essential to DoIT's work and vitally important with the continual advances in technology, innovative education, and research, as well as the university's expectation for new services and capabilities. DoIT is investing resources to support learning and professional development, including training and upskilling staff to become more technically and operationally agile. Additionally, the Gartner for Technical Professionals license has been extended to include the full body of Gartner literature and is now available to all UW–Madison faculty, staff and students.

MAJOR ACCOMPLISHMENTS IN SUPPORT OF THE UW–MADISON MISSION

REACH

Co-sponsored by DoIT Academic Technology and the Educational Innovation (EI) Initiative, the REACH team has partnered with schools, colleges and the Office of the Provost to redesign 14 courses to be more student-centered and inclusive since 2015. There will be an additional 5 courses in fall 2019.

REACH ENROLLMENTS SINCE 2015

34k+ enrollments

16k+ students

Student Digital Ecosystem Strategic Expansion

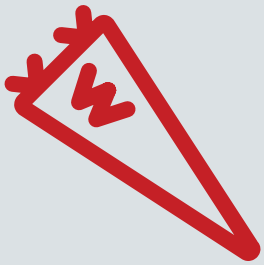
A university consortium of infrastructure providers, policy-makers and operational teams oversees the evolving Student Digital Ecosystem (SDE), which connects university-wide systems such as student information, learning and curriculum management systems, and digital assessment tools. In the past year DoIT introduced new content-authoring and quizzing tools, partnered on the Engage eText pilot, helped establish a sanctioned source for course and program learning outcomes, and implemented improvements to the Canvas platform. This included an integration for the official syllabus and access to Canvas Commons, an enterprise-wide learning object repository.

Center for Digital Accessibility & User Experience

Formed in fall 2018, the Center partners with people across the university to design a more accessible, usable digital university. The Center recently collaborated with the Office of the Registrar, Office of Undergraduate Advising and Office of Compliance to make it easier for students to navigate their first year on campus, discover majors, plan the next semester, and chart a degree path at UW–Madison.

ITA CLASS OF 2019

43
graduates



100%
accepted to college

Information Technology Academy

As a pre-college initiative to increase enrollment rates of diverse students at the university, Information Technology Academy (ITA) provides high school students with hands-on training, academic support, leadership development and internship opportunities. ITA programs serve students in the communities of Lac du Flambeau, Madison and Oneida.

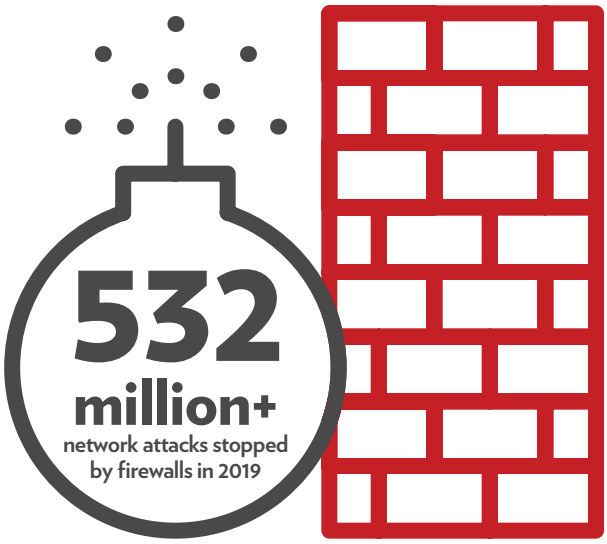
Unified Communications

UW–Madison migrated legacy telephone service to Cisco Voice over Internet Protocol (VoIP) by leveraging the campus network.This enabled 20,779 users to become mobile and work collaboratively from multiple locations by providing “single number reach” across all devices. The migration provided new capabilities for statistical reporting, improved customer responsiveness, and quality assurance and training. In addition, Cisco Webex Meetings and Webex Teams deployed to all faculty, staff, and student employees, offering the ability to host web conferences with up to 1000 attendees.

Wisconsin Public Radio (WPR)

During fall 2018, DoIT worked with Wisconsin Public Radio to modernize their entire audio and broadcast engineering infrastructure as well as convert from an analog system to a digital back-end. The DoIT team facilitated the development of a sophisticated cross-campus networking solution in addition to a site for servers and specialized audio equipment.

CYBERSECURITY



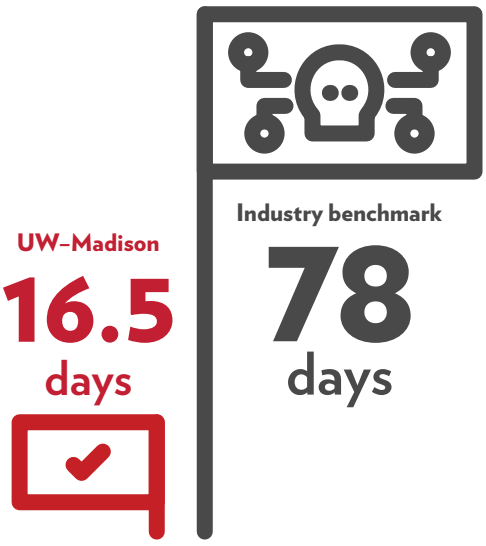
Next Generation Firewall

Next Generation Firewall services were deployed to 95% of campus networks. NextGen Firewalls provide the ability to detect and prevent malicious activity for over 750 networks serving administrative, research, academic, and business needs. NextGen Firewalls replaced the aging Cisco firewalls. The new generation of firewalls provide the ability to have virtual firewalls in a single appliance. This allows the firewalls to use external intelligence sources to better detect and block threats as well as provide increased control.

Cybersecurity Risk Management: Monitor, Investigate, Remediate

Over the past three years, the university invested $8.8 million in people, tools and processes needed to manage cybersecurity risk. The Office of Cybersecurity provided the university with technical information about gaps in cybersecurity and identified the potential impact to the missions of teaching, learning, and research. Using cybersecurity risk intelligence, central and distributed IT teams enabled protective controls which resulted in a low risk profile over the past year. By re-prioritizing patching schedules in the Data Center, potential risk of exposing of over 21 million identities was reduced while the systems remained available. Fifty-six security risk assessments were completed over the past two years, with 23 related to supporting healthcare research and clinical needs.

COMPROMISED DWELL TIME



Vulnerability Management

Cybersecurity has added additional capability and capacity to perform vulnerability scanning allowing a more detailed view of information system risk. In early 2019, Qualys vulnerability scanning licenses were purchased to enable frequent scanning of up to 10,000 web servers, application servers and network segments, allowing early identification of vulnerabilities in order to prevent cybersecurity events. These tools and operations help central and distributed IT efficiently maintain the availability and security of UW-Madison data and information systems.

Shared Financial System (SFS) Upgrade

The UW-System Shared Financial System upgrade went live in October 2018. The new version allows for the regular delivery of new features without the need for large, costly upgrades. A team of 35 DoIT staff evaluated and implemented over 60 new features, most notably work centers and dashboards that help drive usability and user productivity. Over the course of the project, the team removed 17% of customized objects, implemented 325 necessary business modifications, and tested 1500 cases for 235 business processes and 33 major integration points with other business systems.

Student Information System (SIS) Upgrade

The UW–Madison Student Information System upgrade went live in July 2019, providing the university with a scalable, modern SIS infrastructure. Thirty-one DoIT staff across multiple departments contributed to the project which included cloud-ready architecture and improved security. The project identified, documented, and tested 137 SIS integrations with other applications and greatly reduced the number of inefficient custom modifications in the process.

Project Ice Cube

The Wisconsin IceCube Particle Astrophysics Center (IceCube) is a world-renowned research center providing fundamental insights into the origins of the universe. IceCube partnered with DoIT's Data Center team in 2018 to relocate research computing infrastructure to the first off-campus, leased hosting facility at OneNeck IT Services LLC in Fitchburg. As an anchor partner, IceCube helps DoIT test the research network limits while hunting for high energy neutrinos.

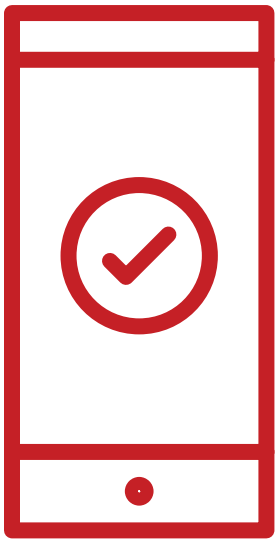
UW-Madison Scholarship Project

DoIT's Enterprise Business Systems group implemented a Blackbaud tool that significantly increases efficiency in managing scholarships, award recipients and donors. This improved approach reduces redundancy and complexity, utilizes best practices in line with over 700 other universities, makes future enhancements easier and offers an integrated experience between donors and those receiving awards.

Multi-factor Authentication

DoIT's project team, in conjunction with implementation partners from divisions, departments, and groups across the university, completed the rollout of Duo's Multi-factor Authentication (MFA) solution for over 23,000 faculty and staff. Students will adopt MFA-Duo this fall with completion scheduled for December 2019.

MULTI-FACTOR AUTHENTICATION



roll-out completed

100%

coverage

to

23k

faculty and staff

COMMUNITY ENGAGEMENT

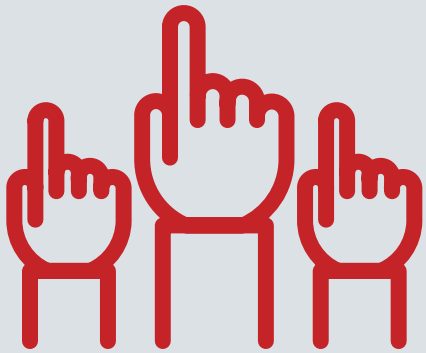
Listening Sessions

In the fall of 2018, CIO Lois Brooks held multiple listening sessions across the university providing the opportunity for members of the IT community to share their thoughts on how to simplify historic complexities, remove IT redundancy and work toward a more robust, secure and scalable enterprise. The input from those sessions helped inform the framework for the comprehensive DoIT transformation and guide the list of strategic IT initiatives. *(See Strategic Initiatives on page 4.)*

LISTENING SESSIONS FALL 2018

179 attendees

231 suggestions



IT Connects

Sponsored by the Office of the CIO, IT Connects brings the university IT community together, offering professional development and networking opportunities. Six diverse groups combined to host over two dozen events the past year ranging from full-scale conferences to group member meetings. More than 90 guest speakers shared their insights with the community through over 50 presentations.

CONFERENCES 2019

775+ attendees

111 speakers

Conferences

DoIT partnered with the broader UW–Madison IT community to present three annual IT-focused conferences. Over 700 faculty, staff and local community members participated in Lockdown (Cybersecurity), ITLC (IT Leadership), and the IT Professionals Conference. Attendees gained insights from IT experts, built relationships across campus, and shared information among peers.

THINKING FORWARD

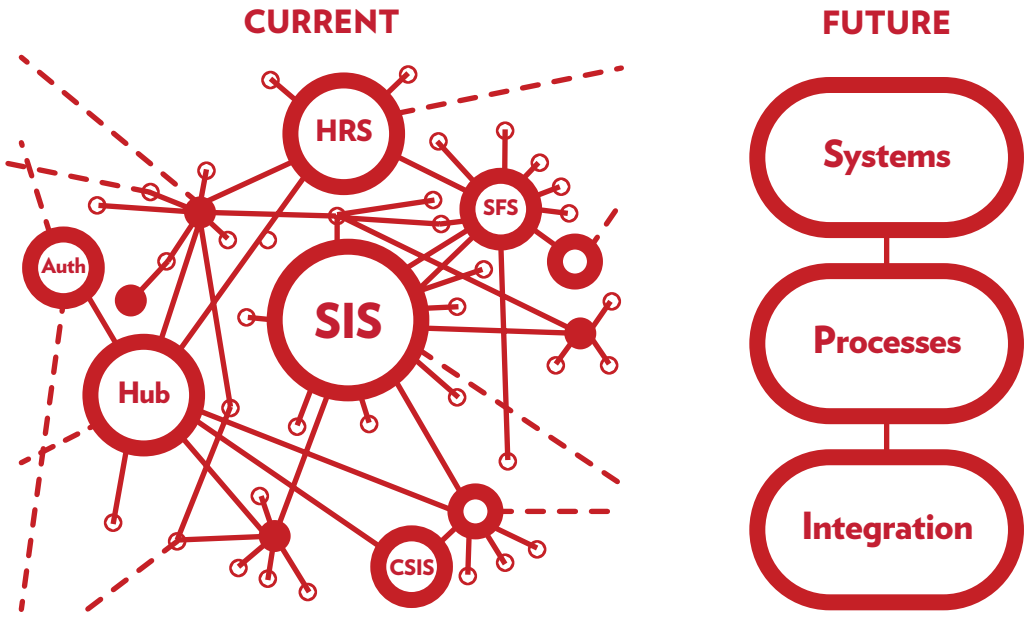
As technology continues to evolve, and the research and business needs of the university become more diverse and complex, DoIT is committed to anticipating these challenges and supporting the teaching, research and outreach of the university.

Administrative Transformation Program

UW–Madison and UW System are embarking on the Administrative Transformation Program (ATP) to redesign human resources and financial systems and services. DoIT is an integral partner in this program to reduce complexity and redundancy. The overall goal is to greatly simplify and reduce the amount of time the UW community spends on the administrative business of the university.

Interoperability

In preparation for the Administrative Transformation Program and to serve more broadly the university's goals for business intelligence and improving learning outcomes, DoIT will continue its progress on the Interoperability Transformation Initiative. The effort will deliver modern, scalable and secure services for data interoperability, data management, and identity and access management. This work solves two core problems, keeping systems in sync with timely and accurate data, and ensuring that people have appropriate access to systems and data to perform their valuable work.



Analytics & Business Intelligence

The work of the university relies on the timely flow of accurate and reliable data and the ability to ensure that people who need access to data have it, and that the appropriate levels of access are maintained. In partnership with others, planning is underway for a new data infrastructure for business intelligence and analytics.

Learning Analytics

Over the last five years, DoIT has collaborated with university partners and coordinated projects such as the establishment of university guiding principles and the Learner Engagement Analytics Dashboard (LEAD) pilot. Based on requirements gathered from instructor and partner engagement, LEAD was created to display students' interaction data from Canvas via a visualization software from Tableau. Current LEAD work targets additional learning technology data to provide a holistic view of student interaction, as well as scaling to larger audiences. The team is also exploring tools to expose meaningful data to students in order to empower them to take ownership of their learning journeys.

One Badger Constituent Relationship Management

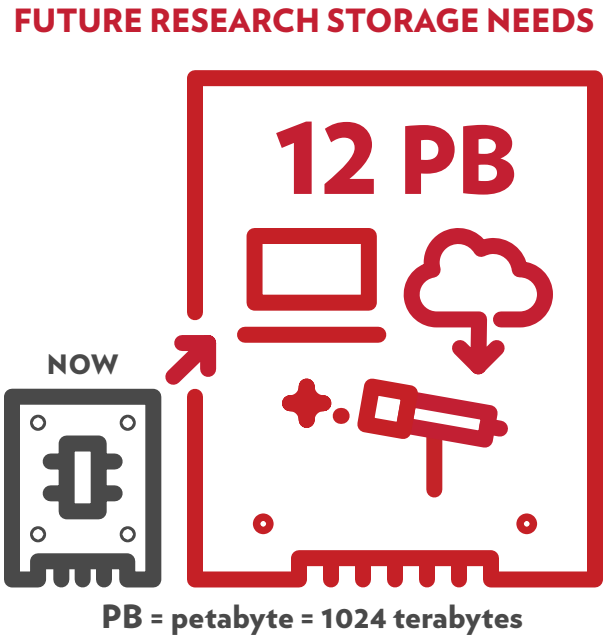
UW–Madison is implementing an enterprise-wide CRM system to provide the university with a holistic, 360-degree view of learners throughout the entire lifecycle of their relationship with the university. Over 60 business use cases from a wide variety of university units have already been identified and the number continues to grow. The groundwork is being laid to implement these use cases and to encourage further adoption which will maximize the value that the tool can provide.

Network Re-architecture (Next Generation Network)

Network Services has launched a study to document current state wired, wireless and cloud network capabilities, identify existing gaps, and establish a prioritization for a needed upgrade. The upgrade will reduce network redundancy, complexity, and operational expenses while increasing uptime and provide improved security and agility within the network.

Enterprise Cloud Strategy

Efforts to shift services to the cloud are underway and will continue to advance in the coming year: architecting security patterns that facilitate agile consumption of cloud Infrastructure as a Service (IaaS), and prototyping new solutions with researchers and business partners.



Research Cyberinfrastructure

In partnership with research leadership, academic units, and the emerging Data Science Institute, DoIT is creating foundational IT infrastructure services to underpin the work of individuals, facilitate collaboration, and enable innovation. The key outcomes will be affordable data storage, accessible cloud infrastructure, available data lifecycle support, and scalable computational resources for high-throughput and high-performance computing.

Online Learning Initiative

Enhancing and scaling online learning is a significant focus to personalize the learning experience with technology and expand access to traditional and new student audiences. DoIT helps drive this goal through providing the technology infrastructure and services for these programs, and the development of courses selected through the Online Learning Initiative led by the Vice Provost for Teaching and Learning. In addition, DoIT is leading new instructional design and development for the Global Health online certificate program and contributing resources to the School of Human Ecology undergraduate degree completion effort.

APPENDIX

DoIT
Division of Information Technology
UNIVERSITY OF WISCONSIN–MADISON

Organizational Overview