IMPACT REPORT
FY 2023

Information Technology
A season of change

Change was a constant theme for FY23. Most notably, we transitioned from being Information Technology at Purdue (ITaP) to Purdue Information Technology (Purdue IT). On the surface, it may seem like simple semantics, but the rebranding of Purdue IT marks a much deeper change, which is just getting started. During FY23 we:

- Welcomed a new Purdue University President, Dr. Mung Chiang.
- Integrated IT operations system-wide into one unified organization, including our Distributed Campus Services and Academic IT Support units.
- Implemented ITIL 4 training and Intent-Based Leadership practices across the organization.
- Focused on delivering excellence at scale with speed.

Everything we do within Purdue IT is in service to our vision "to empower our students, faculty, and staff with the technology to make giant leaps to advance knowledge, impact our state, and make a better world."

The information in this report is a high-level overview of the impact we’ve made in these areas throughout the past year. You may notice a common theme in the three pillars that guide our daily work:

- **People** – Developing the skills and talents of our workforce.
- **Processes** – Refining and improving our processes towards operational excellence.
- **Technology** – Delivering the right technologies to solve the right problems at the right time.

All this in the quest to become the premier information technology organization in higher education, and every day we get a little closer to achieving that goal. Boiler up!

Our talented Purdue IT staff embody this vision by providing the technology infrastructure, services, solutions and information security to support teaching and learning, enhance research and enable faculty and staff to achieve their objectives while providing a positive student experience.

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**Mission**

Purdue IT provides the technology infrastructure, services, solutions, and information security that support teaching and learning, enhance research, and enable faculty and staff to achieve their objectives while providing a positive student experience.

**Vision**

To empower giant leaps across Purdue by providing safe, efficient and reliable services in our pursuit to become the benchmark for IT in higher education.
The Purdue IT End User Experience (EUE) unit focuses on engagement with faculty, students and staff to ensure timely, quality service and ease of use while minimizing time to resolution when incidents occur.

STREAMLINING THE CUSTOMER EXPERIENCE
In August 2022, the team launched a telephone call-back option for those on hold with the Service Desk for more than 60 seconds. Users waiting to speak with a representative can enter their 10-digit domestic phone number to retain their place in line and receive a phone call when the next support staff team member is available.

- 86,630 Calls Handled
- 49,543 Emails Handled
- Service Desk Avg. Wait Time FY22 = 3 min. 33 sec.
- Service Desk Avg. Wait Time FY23 = 1 min. 7 sec.

EXPANDING JAMF CLOUD SERVICE
The Purdue Apple Enterprise (PAE) team continues to work with Purdue’s academic colleges to enroll computers and iOS devices in the Purdue IT JAMF Cloud service. This project has focused on building relationships, deepening trust across Purdue’s academic and administrative units, enhancing security, and further embracing Apple devices across the Purdue system. As part of collaborative work with the academic colleges, PAE and the Purdue networking team have implemented secure device-based Wi-Fi access for Purdue distributed classroom iPads, which will open further instructional use cases and opportunities across all platforms in the future. In addition, PAE designed and implemented the Secure JAMF service to assist with Purdue’s CUI efforts. This allows secure macOS or iOS devices to participate in Controlled Unclassified Information (CUI) endeavors.

SUPPORTING CLASSROOM TECHNOLOGY
Purdue IT’s End User Experience Learning Spaces team is responsible for keeping centrally scheduled classrooms up to date with the latest A/V technology, in addition to assisting with life cycle replacements and upgrading A/V equipment in other campus labs, meeting spaces and locations.

- 300 Classrooms
- 110 Projectors
- 40 Class-Labs
- 21 Conference Rooms
- 19 Digital Signage Locations
- 27 Huddle Rooms (Small Meeting Rooms/Spaces)

DURING FY23, PURDUE VIDEO PRODUCTION PRODUCED:
- 238 Individual Conference & Event Recordings
- 189 Individual Studio Productions
- 25 Promotional, Instructional & Documentary Videos
IT Enterprise Solutions provides services centered on application strategy, development, transformation, integration and software support across custom and enterprise solutions.

**INCREASING EFFICIENCY WITH ROBOTIC PROCESS AUTOMATION**

Purdue IT’s Robotic Process Automation (RPA) Center has successfully optimized customer service and efficiency in numerous areas for Purdue University. In August 2022, Purdue IT deployed two pilot automations using RPA. The associated productivity savings allowed Endpoint Support Services to transfer two desktop service specialists to become RPA developers in the new center.

RPA’s cutting-edge software technology is specifically designed to tackle high-volume, repetitive digital tasks that are currently completed manually. Software robots can easily comprehend screen contents, execute appropriate keystrokes, navigate complex systems, extract data and perform a wide range of actions in accordance with defined business logic. The beauty of this technology is that these actions can be executed consistently and at a rapid pace, without any downtime or the need for breaks.

One of the first projects RPA launched was BoilerBot, a chatbot feature designed to help university students, faculty and staff quickly resolve passcode issues. The team has since expanded BoilerBot’s functionality and continues to look for ways to enable self-service with BoilerBot. The team also launched a project to improve efficiency with the procurement related Goods Receipt/Invoice Receipt (GR/IR) process.

**RPA Metrics FY23**

- Total Processes Run: 139,808
- Support Hours Saved: 11,386
- End User Hours Saved: 9,605
- Total Cost Avoidance: $383,762

**MOBILE ID**

In April 2023, Purdue University launched an electronic student identification system designed to eventually replace hard-copy IDs. Purdue IT teams spent months developing custom-software applications that enable ID card readers to deliver PUIDs safely and effectively to various other applications.

While Purdue Mobile ID is enabled for smartphones, smartwatches and other devices through the Transact Mobile Credentials application, the custom software marries the device to a destination point downstream for campus units and users.

Because of these innovative software solutions, students can use their mobile IDs to access residence halls and buildings, make transactions using BoilerExpress, tap to dine and even pay when doing their laundry.

Named Tapawingo and Swype, these software applications are making life easier across campus — from simplifying payroll timekeeping for Human Resources’ WebClock and RecWell’s fitness classes such as FusionGo and package pickup through University Residences’ Intra mailroom system to checking in through BoilerConnect for the Disability Resource Center’s many testing centers. Even the basics for checking out books and resources from Libraries are now equipped to use Purdue Mobile ID. And that’s just the beginning of an innovative technology designed to be ubiquitous someday for student activities across Purdue’s West Lafayette campus.
Purdue's Rosen Center for Advanced Computing (RCAC) provides advanced computational resources and services to support Purdue faculty and staff researchers. The center also conducts its own research and development to enhance the capabilities of these resources.

**HIGHLIGHTS**

- Weber High Performance Computing (HPC) cluster to export controlled research upgraded with new AMD Epyc nodes, as in the Negishi cluster.
- RCAC’s Envision Center collaborated with FlightProfiler to create a geospatial web-based visualization that allows pilots to see meteorological conditions along their planned route to plot an optimal course.
- Led by the RCAC, Purdue joined as a founding partner in the new Quantum Collaborative launched by Arizona State University. It is a major 21st century initiative poised to profoundly impact society and the American economy with new discoveries and applications in advanced quantum technology.
- The RCAC added a significant number of Graphics Processing Units (GPUs) to the Gilbreth community cluster during FY23. In fall 2022, RCAC added 93 new NVIDIA A10, A30 and A100 GPUs. In spring 2023, the center added 104 new NVIDIA A100 GPUs. The new GPUs bring Gilbreth to an aggregate peak performance of 32 single-precision PetaFLOPs (one quadrillion operations per second) - doubling Gilbreth’s AI performance.

**SPONSORED RESEARCH**

**Awards:** RCAC-using faculty partner accounted for 60% of awards in FY23, for a total of $395M. (61%/$350.8M in FY22) This is a $45M increase in new awards to RCAC PIs.

**Expenditures:** RCAC-using faculty accounted for 64% of sponsor expenditures in FY23, a total of $362.7M. (Up from 56%/329.1M in FY22) This is a $60M increase in expenditures by RCAC PIs.

**F&A:** RCAC-using faculty paid $77.5M of F&A to Purdue’s general fund in FY23 – 88% of all F&A recovered. (Up from $69.9M/79% in FY22)

**SPOTLIGHT: NEGISHI COMMUNITY CLUSTER**

The Rosen Center for Advanced Computing (RCAC)’s newest community cluster, Negishi, named in honor of distinguished professor of chemistry and Nobel laureate Ei-ichi Negishi, was dedicated February 24, 2023, in a ceremony including Negishi’s daughters and their families. Negishi was available for faculty use in May 2023.

This is the largest and most powerful cluster Purdue has built other than the NSF-funded Anvil system. Just like its namesake, this cluster will help set Purdue apart from other universities and attract top talent.

The Negishi cluster is optimized for communities running traditional, tightly coupled science and engineering applications. The cluster was built through a partnership with Dell and AMD in 2022. Negishi consists of 460 Dell compute nodes with two 64-core AMD Epyc “Milan” processors (128 cores per node) and 256 GB of memory, six large memory nodes with 1 TB of memory, and 15 AMD Instinct MI210 Graphics Processing Units (GPUs). By May 2023, there were 68 research groups onboarded to the Negishi cluster through an Early User Program (EUP) in which they received individualized assistance from RCAC consultants with corresponding domain knowledge. An accelerated weekly maintenance cycle during the EUP greatly helped in deploying new features quickly and reliably.

Negishi is part of Purdue’s community cluster program, which is now in its 18th year and serves more than 220 active partners from 60 departments and all three Purdue campuses. Sixty-one percent of Purdue’s grant awards last year were awarded to faculty using high-performance computing.

**SUPPORTING RESEARCHERS PERFORMING AI AND MACHINE LEARNING**

In a multidisciplinary endeavor that has far-reaching implications for computer science, urban planning, digital urban forestry, ecological sciences and related domains, a team led by a Purdue associate professor of computer science has leveraged the power of 100 of RCAC’s Graphics Processing Units (GPUs) to advance the field of deep generation of urban-related content.

The GPUs, on RCAC’s Gilbreth community cluster, were added as part of recent investments to better support researchers in the fields of AI and machine learning. This pioneering research exemplifies the power of cutting-edge technology and collaborative interdisciplinary efforts, paving the way for a future where urban content generation becomes increasingly sophisticated and impactful.

With the recent expansion, the Gilbreth GPUs have an aggregate peak performance of 32 single-precision PetaFLOPs (one quadrillion operations per second) - doubling Gilbreth’s previous AI performance. Over the last year, Gilbreth has supported 98 principal investigators from 25 departments, enabling research ranging from computer science and electrical and computer engineering, to healthcare, energetics and materials science.

The added resources are just a part of RCAC’s ongoing investment in supporting researchers performing AI and machine learning work. Along with the additional hardware, RCAC has full-time research scientists with AI and machine learning expertise, who offer training opportunities and are available to partner with faculty on proposals.
Enhancing Purdue University’s security posture is a top priority for Purdue IT. The Security and Policy teams work diligently to protect the security of the data that crosses the networks and to promote the preservation of personal security and privacy for all people at Purdue.

**EXPANDING MULTIFACTOR AUTHENTICATION**

Purdue adopted Microsoft Multi-Factor Authentication (MFA) for all personal University email accounts and Microsoft Office 365 applications at all campuses. Through MFA, users are prompted during the sign-in process for an additional form of identification, such as entering a code on their cell phone or providing a fingerprint scan. Requiring a second form of authentication increases security because this additional factor isn't something that’s easy for an attacker to obtain or duplicate. Monthly compromised accounts decreased significantly to almost zero when MFA was implemented.

Compromised Accounts FY22 = 298

Compromised Accounts FY23 = 23

**KEEPING EMAIL SECURE**

In FY23, users at Purdue's West Lafayette, Fort Wayne and Northwest campuses sent roughly 40,534,000 emails and received 429,917,000 emails. Purdue IT implemented Microsoft's Defender for Office (MDO), a security email service that protects Purdue University accounts from malicious phishing campaigns, marketing spam, malware, and more. Using Microsoft’s machine learning and Artificial Intelligence (AI), MDO provides greater email security and protection from the latest email threats.

Purdue also implemented external casing for emails for all campuses. External casing provides a cautionary banner at the top of emails when the sender is external. The banner notifies the recipient of the external senders and issues a cautionary message regarding attachments, links or sharing data.

**RENEWED PARTNERSHIP WITH OMNISOC**

A founding member of OmniSOC, Purdue University renewed its partnership with the organization in March 2023. OmniSOC is a shared, collaborative higher education security operations center (SOC) led by Indiana University (IU). OmniSOC provides 24/7 network security monitoring for its networks, conducts proactive threat hunting, and cybersecurity advisory services. OmniSOC provides 24/7 network security monitoring for its networks, conducts proactive threat hunting, and cybersecurity advisory services.

OmniSOC operates in conjunction with the formidable capabilities of the Global Network Operations Center (GlobalNOC) housed at Indiana University. It also makes use of threat intelligence insights from the Research and Education Networking Information Sharing and Analysis Center (REN-ISAC) housed at Indiana University, OmniSOC also partners with counterparts in Australia, Canada, and the UK in a cybersecurity threat intelligence-sharing partnership.

OmniSOC was founded by members of the Big Ten Academic Alliance, including Purdue University, to reduce the time from first detection of a security threat to campus mitigation. Today, OmniSOC’s members include higher education and research institutions of all sizes, both public and private. OmniSOC, through ResearchSOC, supplies cybersecurity for the nation’s greatest research.

OmniSOC is a member of the Indiana University cybersecurity community, which includes the Research and Education Networks Information Sharing and Analysis Center (REN-ISAC) and the Center for Applied Cybersecurity Research. See [leading.iu.edu](leading.iu.edu) for more information.

**PROTECTING ONLINE ACCOUNTS WITH LASTPASS**

Of all the security measures you can take to protect yourself online, the most crucial may be safeguarding your passwords. With sites requiring more complex passwords, and the best practice advice to avoid using the same password for multiple services, it can become easy to lose track of passwords and risk exposure to your accounts. According to some studies, the average person now has around 100 online accounts that require a password – a difficult quantity to remember.

To combat this security risk, in February 2023 Purdue Information Technology partnered with LastPass to give all faculty, staff and students on the West Lafayette, Fort Wayne and Northwest campuses access to the LastPass password manager for managing all their online passwords.

A password manager is a software application that stores and manages your online credentials in an encrypted database. LastPass works by installing a browser extension on your computer or an app on your mobile device that allows you to save account passwords in a “vault” and apply them simply by using your one LastPass password. LastPass can also alert you to possible compromised passwords found on the dark web due to a data breach.

**PREVENTING DATA LOSS**

Over the last year, Purdue IT worked with multiple resources to expand and deploy data loss prevention (DLP) services on site and in the cloud. DLP is a security solution that helps identify and prevent unsafe or inappropriate data handling practices while sharing or storing data. It helps Purdue IT monitor and protect sensitive or restricted data across the system. It enables information to be classified and reported to data owners and stewards, along with the compliance team to ensure safeguards are in place.

In fall 2022, Purdue began DLP deployment to centrally managed endpoints across multiple campuses, and also began scanning remote storage systems for sensitive or restricted data. In spring 2023, each Microsoft O365 tenant in the Purdue System now audits internal and external communication. Each tenant can audit O365 for SSN, PCI and HIPAA data.
**ITIL 4 FRAMEWORK**

Purdue IT adopted the Axelos IT service management framework ITIL (IT Infrastructure Library) to create an agile, flexible organization that focuses on creating value for customers. ITIL gives all Purdue IT employees a common language and framework for delivering IT as a service, regardless of an individual’s role or area of expertise.

Hewlett Packard Enterprise (HPE) conducts the multi-day courses, teaching the basic concepts of ITIL and how to implement them. In addition to taking the courses, all Purdue IT employees will be certified in ITIL 4 Foundation and can seek additional certification in the other specialties.

Purdue IT became the first organization within the Purdue University system to implement an Intent-Based Leadership (IBL) approach. IBL challenges the traditional model of “Leaders and Followers” and instead focuses on building leadership at every level of an organization. It starts with the idea that teams work better when decisions are made as close to the front line as possible, rather than being pushed up for approval. It combines a set of practices and language that help teams to work better together, to improve the quality and speed of decision-making and to ensure that teams make the optimum use of the knowledge and skills of their people.

Purdue IT’s IBL journey is led by a team of internal coaches who are being trained by IBL International to provide the development and coaching on the practices and language that will help all staff embed this method. In April 2023, Purdue IT began the formal training program led by an IBLI trainer. Phase 2 begins in fall 2023.

### Other Professional Development

- **ITIL 4 Foundation** – Introduces an end-to-end operating model for the creation, delivery and continual improvement of technology-enabled products and services.
  - 650 trained
  - 544 certified

- **ITIL 4 Specialist: Direct, Plan & Improve** – Provides the practical skills necessary to create a learning and improving IT organization with a strong, effective strategic direction.
  - 27 trained

- **ITIL 4 Specialist: Create, Deliver & Support** – Covers the core service management activities and expands the scope of ITIL to cover the creation of services.
  - 40 trained

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- **IBL Phase I Training**: 158 Staff

### Other Professional Development

- **Agile Framework**
- **Tuck Executive Education at Dartmouth**
- **Purdue University Daniels School of Business Courses**
- **Conference Attendees**
- **Conference Presenters**
- **Workshops / Courses**
- **Certificate Programs**
- **Other Independently Completed Trainings**
  (Not connected to a degree or certificate program)
To further integrate IT resources across the Purdue system, IT services for Purdue Northwest, Purdue Fort Wayne and Purdue Indianapolis transitioned into the Purdue IT organization as Distributed Campus Services.

Purdue Fort Wayne

- 5 new active learning classrooms
- 28 enhanced lecture classrooms
- Wired infrastructure upgrades in residence halls
- Numerous improvements to Brightspace Learning Management System
- Upgraded Degree Works to provide new features for students
- Implemented EdSights AI chatbot to focus on student success and support

Purdue Northwest

- Deployed internal learning tool integration in Brightspace LMS to ensure eBook access for all students and instructors
- Offered training for 6,285 students
- Provided on-demand 1:1 consultations for over 2,000 faculty, staff or students
- Implemented UniTime scheduling assistant to improve registration process for students
- Launched Degree Works Transfer Equivalency, a self-service tool for students to determine how their credits transfer before applying

Purdue University in Indianapolis launching Purdue’s first comprehensive urban campus and forming America’s Hard Tech Corridor

On June 14, 2023, Purdue University trustees and Indiana University trustees simultaneously approved the agreements that will effectively dissolve IUPUI on June 30, 2024, completing a process that started in August 2022. Now, two outstanding universities with complementary strengths will arise in Indianapolis.

At the same time, Purdue's Board of Trustees further established Purdue University in Indianapolis, with multiple locations throughout the city and degrees from Purdue University West Lafayette. In addition to continuing the PU part of IUPUI, Purdue will bring many more programs from possibly all colleges and departments in West Lafayette to Indianapolis.

Purdue will have the physical resources, state appropriations and freedom to independently operate its urban campus. This will allow Purdue to expand the academic and research excellence that the university is known for to Indiana's capital city, while investing in and partnering with Indianapolis to significantly grow the tech-driven economy in central Indiana.

The new Purdue University in Indianapolis will also serve as one bookend for a 65-mile-long Hard Tech Corridor in Indiana, stretching from downtown Indianapolis, through the LEAP Innovation District in Lebanon with new sites from companies such as Eli Lilly and Company, all the way to Discovery Park District in West Lafayette.

Purdue will invest in making the Hard Tech Corridor the most consequential engine of economic growth and brain gain in the Midwest as it continues to generate workforce, jobs and innovation together with partners.

Purdue University in Indianapolis will begin operation July 1, 2024.
In March 2023, Purdue University announced the integration of Purdue Academic IT Faculty Support – a large team of experts focused on providing Purdue faculty with enhanced, customized computing services wherever needed – into the newly formed Purdue IT.

To deliver excellence at scale, a user-focused Purdue IT will continue to embed local support for specialized academic IT needs and provide the infrastructure, personalized services, responsive solutions and information security necessary to enhance faculty research and support innovative teaching and learning.

The following areas have been integrated:

- College of Agriculture
- Daniels School of Business
- College of Education
- College of Engineering (and Polytechnic Institute)
- College of Health and Human Sciences
- College of Liberal Arts
- College of Pharmacy
- Purdue Polytechnic Institute (with College of Engineering)
- College of Science
- College Veterinary Medicine
- Graduate School
- Libraries

Across Purdue’s colleges, many significant academic IT innovations continue to emerge. The Academic IT Support team will help to translate these across Purdue and enable the following:

- Enhanced research computing capabilities within the university and with our external commercial and governmental partners.
- Greater research and technology collaboration across our colleges, leading to new services and breakthroughs.
- Accelerated standardization and automation to enable our computing experts to support faculty and departments more responsively.
- New pathways to uncover and focus the future investments needed to advance our computing capabilities significantly.
- Leverage of capabilities in enterprise-IT in academic IT.
- Translation of academic IT advancements into enterprise-IT practice.

**LEVERAGING TECHNOLOGY TO HELP OTHERS**

In partnership with the United Way of Greater Lafayette, Purdue University students enrolled in a Practicum in Taxation course help anyone with a household income of $73,000 or less per year – including domestic and international students and community members – prepare and file their taxes for free through the IRS's Volunteer Income Tax Assistance (VITA) program. The longstanding program is a win-win, providing real-world experience for students to develop the skills needed for their CPA exam while also helping those who may not otherwise have access to tax assistance.

Recently, the number of clients exceeded the available service hours. It became evident that many of these cases were easy to file if the client knew how to answer certain questions. To help solve this issue, the Purdue IT team in the Daniels School of Business created a specialized website called the Purdue VITA site, where anyone with a Purdue login could go to the site and fill out a five-question survey. Based on the results, they would either be directed to a video link that shows them exactly how to file their taxes or they would be directed to an email address at United Way to get assistance for the more advanced cases, which Purdue students would process. This simple website has increased the volume of clients served and gained recognition from the IRS regional offices.
ENHANCED PRINTING SERVICES

In spring 2023, Libraries and Purdue IT added a second wide format printer to Learning Spaces for students’ academic needs. In addition to the printer on the second floor of the Wilmeth Active Learning Center (WALC) near the information desk, there is also now a printer in the John W. Hicks (HIKS) Undergraduate Library near the information desk.

The addition of a second printer is in response to the high volume of activity the service receives, most notably at the end of the semester when students prepare to present their research. In April 2023 alone, students printed more than 1,000 posters using the service.

The wide format printers are geared for research presentation, blueprints and coursework. They are not graphic or photo printers. The printers are accessible during library hours, including evenings and weekends. Purdue IT staff at these locations are available to help users configure their files to print correctly.

IMPROVING WIRELESS CONNECTIVITY

Technicians began work on a five-year, $2.6 million project to upgrade the wireless network for Purdue’s West Lafayette, Northwest and Fort Wayne campuses, which was approved by the Board of Trustees in 2022. A total of 12,750 wireless access points will be installed across all three campuses.

The first phase of the project is now complete, with new wireless access points replaced in all University Residence buildings. With the upgrade, wireless users can see network speeds four times faster than the previous average speed of 150 Mbps with better connectivity in user-dense areas.

In addition, the network upgrade included the launch of the UR Home wireless network in all residence halls. UR Home provides students with their own version of an ‘in-home’ experience. Once they have created their account, students can connect their multiple devices (printers, gaming consoles, Roku, Amazon Alexa, visitor access, etc.) in their own private network using a single access key. UR Home uses a student’s housing assignment and Purdue credentials to authenticate devices within their assigned residence hall.

More than 63,000 faculty, staff and students rely on Purdue’s wireless network for teaching, learning, research and entertainment annually. On the West Lafayette campus alone, there are approximately 100,000 unique devices connected to the wireless network daily, with 4.6 million logins to the wireless system each day.

INFRASTRUCTURE SERVICES

IT Infrastructure Services provides much of the behind-the-scenes work that makes communication and computer systems on campus work. Infrastructure Services consists of these key areas:

- Facilities, Systems and Operations
- Infrastructure Services
- Telecommunications