The 2020 fiscal year has been busier than expected for all of us at the university, including the Information Technology Services department. As the novel coronavirus, or COVID-19, became a health risk across the nation, many universities including Iowa State transitioned to 100% remote work and learning mid-way through the spring semester. Supporting this transition, ITS team members played a significant role in addressing the challenges presented by this global crisis in addition to what would have been the ‘lead story’ of going live with Workday – certainly no small feat. With commitment and ingenuity, ITS teams rapidly aided in the university’s response and support of virtual work and learning, and will continue to do so into FY2021.

David Popelka
Associate Chief Information Officer
Welcome to the newly-initiated Information Technology Services (ITS) annual report.

There has been so much wonderful work going on in the ITS department over the course of the year, in addition to developing solutions to challenges presented by the novel coronavirus pandemic. In this report, we will present highlights of initiatives, activities and accomplishments from across our organization with a focus on impacts around campus.

When assuming this position, I recognized the need to articulate a clear strategic plan to help align our priorities with those of the university strategic vision and inform our decisions. After a two-year effort, our strategic plan is complete and this report is organized according to the four pillars of that plan: Enhancing the educational experience, enabling our partners in research, delivering and supporting enterprise services and enriching our employee and customer experience. We will continue to develop the implementation of this plan in the coming year.

Before this winter, the July 1 Workday Go-Live stood as the biggest news of the fiscal year after 30 labor-intensive months since the official start of the effort and countless hours of preparation. Though there remained refinements and adjustments, the accomplishment is truly remarkable. We continue to seek areas in which to improve through our commitment to continuous improvement.

This year we have also committed to contributing toward the goal of being the most inclusive land grant university through the development of a digital accessibility initiative including a laboratory and several initiatives to ensure all in our community have access to digital information for learning and working. This lab will assist Iowa State in moving to the next level of access. I’m also very proud of our new Inclusion, Diversity, Equity Advisory (IDEA) group. Already, the group has developed short, mid- and long-term goals to enhance our culture of inclusion.

As always, we appreciate input and feedback from all of our stakeholders. Please let us know both what we do well, and also what we could improve.

Sincerely,

Kristen Constant
Vice President and Chief Information Officer
**Managing Cloud-Based Software Preferences**

With the acquisition of Cisco Webex Meetings, ITS named the web-based software as the preferred video conferencing tool for the university. For the 40,000 students, staff and faculty transitioning to remote work and learning in March, Webex became the primary video communication tool. In the three weeks following the transition, statistics showed a 2284% increase in the number of Webex meetings among Iowa State users, which amounted to nearly 600,000 – or 414 consecutive days – of meeting minutes. While more commonly accessed as a desktop application, the Cisco product Jabber provided users with a software solution to replace the Cisco 8800 phones available in offices on site.

In addition, ITS undertook an initiative to contract for Disaster Recovery as a Service (DRaaS), where the university’s vital backup data is transmitted via cloud to an off-site vendor rather than gathered on tape on-site. For more than 50 years, ITS had been reliant on tape for data storage, but as a more sustainable and forward-thinking solution, DRaaS reduces the risk of comprehensive data loss.

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**Technology Distribution in Response to COVID-19**

The ITS endpoint technologies team led the initiative to ensure Iowa State faculty and staff had the hardware and software to successfully work remotely. The team managed software deployments to Windows devices through Microsoft’s System Center Configuration Manager (SCCM) and to macOS devices through JAMF. Between both software clients, 1,214 instances of Cisco AnyConnect Client and updates enabling connection to the university’s Virtual Private Network (VPN) were deployed to campus users.

- **118 laptops**
- **110 monitors**
- **43 docking stations**
- **27 headsets**

The audiovisual experience team (AVXT) contributed to the improvement of physical infrastructure through their installment and support of audiovisual equipment. The team completed 91 fee-for-service projects in the FY at 30-40% less than the price of outside integrators.

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**Physical Infrastructure**

On July 5, 2019, a new licensing enterprise agreement with American multinational technology conglomerate Cisco, negotiated by ITS, went into effect with the expectation of saving the department a total of $693,297 between 2020 and 2024. The licensing agreement alters how ITS licenses network switches and wireless access points that provide internet connections to university facilities.

The licensing agreement contributes to the ongoing switch refresh project led by the ITS network engineering team. Functioning as a controller, switch equipment allows networked devices to communicate with one another, and by replacing more than 800 switches, campus users are experiencing better performance from their desktop computers, better phone call quality and faster wireless speeds. By the end of the project, approximately 30,400 network jacks will be connected to the 795 new Ethernet switches in 188 campus buildings.

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Increase in usage after remote working and learning began

- **2,284%** increase in Webex video meetings
- **1,781%** increase in usage of Microsoft Teams
- **597,005** total meeting minutes

*Between now and 2024*
Standardizing Business Processes

On July 1, 2019, Iowa State University went live with two applications of the Workday software – Workday Finance and Workday Human Capital Management (HCM) – with significant contributions from ITS and thousands of departmental hours dedicated to planning, configuration and testing. Over 350 business processes from 43 separate university systems were matched with processes in the new software, moving most finance and human resources business activity into a single platform. Kristen Constant, then-interim vice president and CIO, served as the executive sponsor of the WorkCyte program, and was responsible for overseeing the transition.

With the implementation of Workday came the standardization of business processes across the university, robust reporting with real-time data, increased employee access to personal and employment information and elimination of inefficiencies from paper-based routines.

Workday additionally provided increased security and access flexibility compared to formerly-used local applications, and its cloud-based capabilities ensured increased security and access flexibility compared to formerly-used local applications, and its cloud-based capabilities ensured increased security and access flexibility compared to formerly-used local applications, and its cloud-based capabilities ensured business continuity as nearly 7000 university employees began working remotely in response to the coronavirus pandemic. From COVID-19 compliance requirements and case tracking to tenure clock extensions and the creation of COVID-specific Worktags, Workday positioned the university to respond in a way that legacy systems could not.

Workday Adaptive Planning, a separate Workday-affiliated planning and budgeting module, also launched successfully in April 2020 despite the challenges of project team employees and users working remotely.

### Web and Application Development Request for Proposal

ITS teams assisted Procurement Services in the completion of a web application and development request for proposal (RFP), by which five vendors were awarded contracts for university web and application projects. As a result, university clients will be able to more quickly and efficiently engage a vendor for their project depending on the vendor’s specialty, including projects requiring learning management systems, Drupal, mobile platforms and more. The updated process for engaging the preferred vendors is under development in FY2021.

### Customer Service (IT Solution Center and AVXT)

As the most customer-facing team of the ITS department, the IT Solution Center continued serving as the primary, one-contact solution for resolving technical issues across Iowa State University. With the implementation of the ServiceNow platform near the end of FY2019, the IT Solution Center successfully transitioned to the ServiceNow platform for processing reported incidents, with an average of 3,811 incidents attended to monthly. The center’s 84 student employees and five full-time employees responded to 44,461 total voice calls at a rate of approximately 123 calls per business day. The business services with the most requests for support include identity services, Okta and software, accounting for 64% of all incidents. Moving forward, the IT Solution Center aims to empower more customers with technical solutions through the IT Portal knowledge base and decrease the number of incidents related to resetting passwords, device registration and self-service items.

As another customer-facing team, the AVXT resolved 1,178 reported incidents, approximately 4.7 per working day.
Enabling our Partners in Research

The ITS High Performance Computing (HPC) unit operates the central compute research and education clusters for Iowa State University, including the Nova Cluster, Condo Cluster and Education Cluster. The clusters represent 492 nodes, or self-contained computer units, and 92TB of memory within the nodes, which is the equivalent combined memory of 11,776 new MacBook Air M1 computers. The clusters contain over 11,000 cores capable of running computational processes to enable the large-scale computing needs for scientific and instructional endeavors.

With HPC cluster expertise, researchers decreased time investigating, purchasing and managing small compute clusters and capitalized on the ability to use greater resources than were individually available. As a result, university researchers on the clusters have increased grant funding by $20 million per year since the mid-2010s, a 47% upturn. The HPC team itself has secured $3.6 million in funding since 2017.

By innovatively using no-cost software solutions, HPC also provides high-level computing and storage tools to the university, decreasing operational costs while allowing vital budget allocation.

- ZFS file system provides enterprise-level features on widely-available consumer devices, also referred to as “commodity hardware”
- BeeGFS parallel file system provides high speeds for cluster applications on commodity hardware
- BeeOND provides an on-the-fly scalable parallel scratch file system across cluster compute servers

Additionally, HPC continued to manage the Ceres compute cluster at the National Centers for Animal Health, Ames, in partnership with the United States Department of Agriculture (USDA). Under HPC management, SCInet, the USDA Agricultural Research Service effort to improve the USDA’s research capacity, experience increased speed and security.

A FY2019 initiative to reduce computer room air condition (CRAC) unit energy consumption resulted in additional cost savings realized throughout FY2020. The Data Center and system operations teams implemented hot-aisle containment solutions at 25% the cost of proprietary solutions to duct air and reduce cooling needs. The chilled water and electric utility consumption was reduced by about 15%, saving approximately $100,000.
Virtual Commencement

With spring 2020 in-person commencement ceremonies cancelled, several ITS teams made significant contributions so students and families could celebrate commencement virtually. The AVXT installed professional grade audio-video recording studios at Stephens Auditorium and edited hundreds of minutes of audio files in post-production. Thousands of slides were then included in the commencement videos, each representing a member of the 2020 graduating class. Following those efforts, the web development team carefully curated all virtual commencement content in a beautifully-designed webpage. Graduates and celebrants accessed university commencement ceremony videos by the thousands.

AVoIP in Student Innovation Center

Approximately 220 audiovisual over internet protocol (AV over IP) endpoints were installed in the new Student Innovation Center, marking the first major effort at the university to send live, local, low-latency, real-time audiovisual programming across the network in place of traditional AV cabling like an HDMI cable or HDMI extender. AV over IP is a cost-effective solution using the existing network infrastructure and Ethernet cabling to function. Instructors using this technology can present from almost any classroom in the Student Innovation Center to many locations within the building with little to no delay in audio and video transmission.

Virtual Computer Labs

ITS in collaboration with departmental IT offered students virtual access to campus computer labs in response to remote learning. The teams adapted Virtual Desktop Infrastructure (VDI) software to allow more users access to remote sessions. As a result, students were able to use ISU desktop resources like software specific to a field of study and enhanced graphic capabilities from their personal devices. In total, 17 labs were adapted for remote access, and the service will be continued into FY2021.

Pass/No Pass Grading System a Success

An elective Pass/No Pass (P/NP) grading system for students was put into production at the conclusion of the Spring 2020 semester. To configure the P/NP system, the student information systems (SIS), web development, database architecture and mainframe support (DBA) and enterprise systems architecture (ESA) teams worked together to fulfill workflow, authentication and security requirements set by the offices of the Senior Vice President and Provost and the Registrar. On May 13, the website and P/NP system went live and a total of 11,258 students opted-in for P/NP grading options on over 22,000 courses.
Digital Accessibility Lab Opens

Supporting inclusive digital access as a civil right, ITS opened the Digital Accessibility Lab on November 6 for campus users. Located in Durham Center 108, the lab serves as a physical space for students with disabilities to use assistive technologies, participate in inclusive learning environments and build community. Five work stations support 59 pieces of assistive technology including braille and finger-tap keyboards, pen text-to-speech tools, screen reader programs, a virtual reality headset, XBox gaming system, auditory and tactile control buttons and more. Since it opened, the lab has accommodated more than 150 visitors, several of whom represented Iowa colleges and universities and organizations like the Iowa Department for the Blind, Vocational Rehabilitation and Iowa Disability Services.

Other accessibility efforts by ITS focused on accessible course materials, websites and communications that account for alternative text (alt text), page navigation by screen readers, hyperlinks and other formatting elements. The ITS digital accessibility team conducted 29 university software audits over 232 hours for compliance to the Web Content Accessibility Guidelines (WCAG) 2.1.

Canvas

In its third year of use at Iowa State, the Canvas learning management system supported by ITS and the Center for Excellence in Learning and Teaching (CELT) continued to provide students and instructors with a platform for online learning and engagement. Following the rapid transition to online learning in spring 2020, Canvas saw a significant increase in usage across the campus. Starting with summer 2020, all university courses were required to have a Canvas presence and were strongly encouraged to adopt the university template for ease of transition to online learning.

Classroom Technology Support

In fall 2019, the AVXT managed classroom technology in 207 general university classrooms, separate from spaces designated as Teaching Labs or Seminar Rooms. Their efforts supported 4,126 courses averaging 4,395 hours of class time per week, and somewhat fewer courses and hours in the spring. In addition, the team completed 11 classroom technology upgrades.

| 16 unique software programs |
| 37 unique pieces of hardware |
| 232+ hours of digital accessibility audits |

AVXT manages technology in:

- 207 general university classrooms
- 14,360 seats across 39 buildings
SECTION IV
Enrich the ITS employee and customer experience

Employment with ITS

ITS employed 146 individuals across the units of Enterprise Services and Customer Success, Administrative Information Systems, Information Security, High Performance Computing and Business and Accessibility. In the 2020 fiscal year, 12 full-time employees were hired to the department, joining nine different ITS teams. Additionally 116 students were employed by ITS primarily as technicians and application developers.

Student Employee to Software Engineer

Caroline Rankin graduated Iowa State University in spring 2020 as a software engineering major, earning a Bachelor of Science degree jointly administered by the College of Engineering and the College of Liberal Arts and Sciences. During her time at Iowa State, Caroline also worked as a student technician for Information Technology Services. Before graduation, she successfully secured a job as a software engineer at Cerner Corporation, a company headquartered in Kansas City, Missouri that offers information technology solutions for the health care industry.

Caroline recalls that she first became interested in Information Technology in high school, engaging with her math classes but also assignments that required design, like her school's yearbook. Her time with ITS helped her further develop career skills, as she learned how to communicate technical issues with project stakeholders and others who may not have a background in technology.

Now as a software engineer, she loves the challenge of solving problems. “It always feels very rewarding after working with others and figuring out the solution,” says Caroline.

Best of luck to Caroline on her continued journey in IT!

IDEA Group

The ITS Inclusion, Diversity and Equity Advisory (IDEA) group comprising 12 full-time and two student ITS employees convened in April to begin identifying ways ITS can foster an inclusive and diverse departmental and campus environment. The group was formed in November 2019 and has since completed several readings including “White Fragility” by Robin DiAngelo and curated a list of short-, intermediate- and long-term actions. In FY2021 the group looks to share inclusion, diversity and equity resources and complete an environmental scan survey among other items.

New ITS Website

A redesigned Information Technology Services website aiming to enhance users’ online experience with department services and products launched in April. The new site’s features include a scrolling carousel header on the ITS homepage, hoverable dropdown menus in the navigation bar, categorical news tags, social media integration and easy access to the “systems status” web page. The new website also provides users access to the new IT Portal hosted on the ServiceNow platform through which campus customers can request IT products and services.
New ISUCard Request Application

To ensure new students still received their ISUCards while many offices were closed, web development team members created a new application allowing students to choose and upload a photo for their identification cards in lieu of posing for one on-site.

8,500 images uploaded for 6,380 Cyclones

A student’s ISUCard serves multiple purposes during their Iowa State experience, providing access to university facilities and services such as State Gym and CyRide, allowing for book and resource checkout from Parks Library, serving as a dining hall pass and source for CyCash and more. All photos were stored in a secure Cloud location for printing, and students received their cards in the fall.

ServiceNow and IT Portal

After going live with the ServiceNow platform as a replacement for ChangeGear near the end of FY2019, ITS led the Iowa State community in adopting the software’s incident management, service request and knowledge management applications.

20,000+ monthly log-ins

The IT Solution Center successfully transitioned to ServiceNow incident fulfillment and Improved Service Delivery (ISD) teams across the university utilized the software to fulfill more than 67,000 incidents during the fiscal year. All IT products and services were moved from the ITS website into ServiceNow and made available to Iowa State customers through the software’s customer-facing “portal” feature. Product and service requests in the “IT Portal” route to appropriate fulfillers with increased automation and more efficient workflows.

74 products and services

From April to July, ITS additionally published 22 articles in ServiceNow’s knowledge management tool addressing immediate technology needs. Articles containing information for installing and using applications like Webex, Zoom, Microsoft Teams and the ISU Virtual Private Network (VPN) were shared widely across campus with always up-to-date “permalink.”

22 knowledge base articles

ITS will continue populating the knowledge base throughout FY2021 to provide customers with how-to information and self-service solutions and looks to work with other campus units interested in adopting a respective portal as well.

220 assignment groups across 75 departments

IT Security

The ITS security team provided a variety of services to enrich the campus community technology environment. The team filtered up to 550 emails with malicious attachments each day, and 90% of those that escaped the filter were automatically remedied with endpoint antimalware software. The team also reviewed more than 1,000 requests to change firewall rules, ensuring systems like AccessPlus were not put at unnecessary risk, and partnered with the strategic communications and identity services team to enroll 47.6% students in multifactor authentication (MFA) voluntarily.

Working with units outside of ITS, the security team conducted a risk assessment for the Office of Student Financial Aid to meet the requirements of the Gramm–Leach–Bliley Act, requiring institutions to explain how they share and protect their customers’ private information.

98 vendors reviewed and approved for security

6,866 infections detected, 90% automatically remedied by antimalware software

621 unique targeted phishing attempts mitigated

1,266 firewall changes reviewed