

# INFORMATION TECHNOLOGY

UNIVERSITY INFORMATION TECHNOLOGY SERVICES  
ANNUAL REPORT | FISCAL YEAR 2019

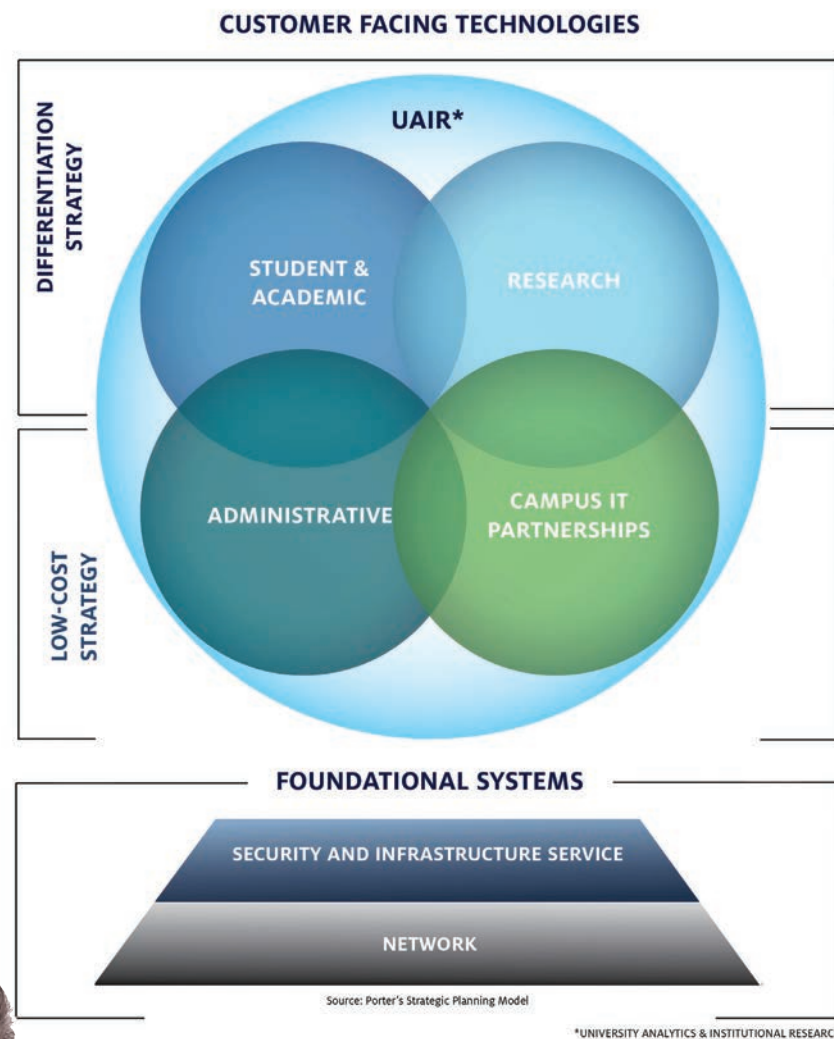


THE UNIVERSITY  
OF ARIZONA

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## UITs ORGANIZATIONAL DESIGN



# UITs



Cover photo by Mary Veres,  
UITs Communications & Marketing

## OUR IT COMMUNITY IS BETTER, TOGETHER

The 2018-19 fiscal year was filled with great success and accomplishments, thanks to our many talented university IT professionals and collaborative partners across campus.

Information technology and the people behind it are integral to the University of Arizona's teaching, research, service, and administrative activities. I am proud of all that UITs and the campus IT community have achieved this year.

Technology is foundational across all pillars of the university's Strategic Plan, providing us an opportunity to support the plan's objectives on many levels. IT has engaged in key Strategic Plan initiatives including Trellis Constituent Relationship Management (CRM), Data Warehouse, Contract Management, and Travel Authorization.

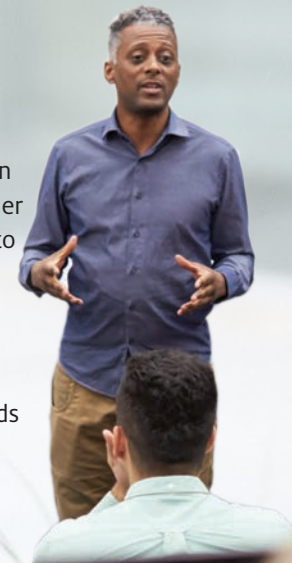
We have seen progress on several campus-wide IT initiatives including: strengthening our information security posture; leveraging our cloud service offerings to realize greater efficiencies and cost savings; improving the student digital experience; and re-architecting IT service delivery. In addition, we welcomed University Analytics & Institutional Research (UAIR) to the CIO division and aligned their service offerings to campus needs.

This annual report highlights some of the exciting work that UITs undertook this past year, and how information technology provides foundational and innovative support to our faculty, staff, students and our community.

As the Chief Information Officer and primary advocate for the value of information technology on campus, I believe our IT community is better when we work together to implement technology services and systems for campus, when we collaborate to solve technology challenges and provide unified solutions.

UITs remains committed to working with our IT community and campus partners to advance the university's mission and goals outlined in its strategic plan. I look forward to serving our campus community to not only solve their technology needs in new and exciting ways, but also continue to advance Arizona as a world-class academic institution.

Barry Brummund  
Chief Information Officer





## TECHNOLOGY FOR WORLD-CLASS RESEARCH

Research Technologies provides key research technology infrastructure and services to support Arizona's world class researchers.

“Using the university’s HPC, we look at the whole genome plus untargeted data. High-dimensional, high-scale data network modeling helps us understand and target the drivers for the onset and progression of the Alzheimer’s disease.”

– Rui Chang, Ph.D., Associate Professor in Neurology and Associate Director for Computational Systems in Biology in the Arizona Center for Innovation in Brain Science

# HIGH PERFORMANCE COMPUTING HELPS PREDICT NATURE OF ALZHEIMER'S DISEASE



Rui Chang, Ph.D., Associate Professor in Neurology and Associate Director for Computational Systems in Biology in the Arizona Center for Innovation in Brain

Science (CIBS), is working on the cure for neurodegenerative diseases. Alzheimer's, ALS and Parkinson's are in the forefront as he uses a cutting-edge big data modeling science approach for precision target discovery and drug development. Dr. Chang is considered the international field expert in using high dimensional, high scale data to model the progression of Alzheimer's disease.

Dr. Chang explains that with the power of the high performance computing center at UITS, "you can integrate a lot of variables at different scales together into a network model, and look system-wise at what the driver is through the pathology and onset of the disease."

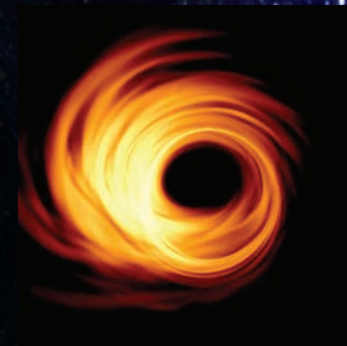
Insights derived from this large data disease progression modeling reveals key drivers for therapeutic targets in cell-type specific ways across the spectrum of age-associated neurodegenerative diseases.

## SERVICES

- SUPERCOMPUTING (HPC)
- REGULATED RESEARCH ENVIRONMENT (CUI)
- RESEARCH SUPPORT SERVICES
- UA VITAE



# BLACK HOLE MODELING IN RESEARCH DATA CENTER



With the help of two radio telescopes coordinated by University of Arizona, astronomers took the first direct image of a black hole. Before the Event Horizon Telescope made history with projecting the first image of a black hole, Arizona Department of Astronomy researchers' harnessed the power of the

El Gato system in the Computer Center's Research Data Center to generate high-fidelity models from data that looked remarkably like the eventual image.

# EL GATO EXPANSION

El Gato was launched in 2013 with a National Science Foundation grant received by the Department of Astronomy. When the grant expired last year, Research Technologies staff decided to maximize computing availability for the campus.

UITS staff reconfigured processing nodes and updated El Gato's operating system to the latest version, so that it can run modern code, and installed three-fifths of a mile of new cabling.

El Gato is one of three supercomputers the university has available for faculty, staff, and students to use at no cost.

**| \$196.7M |**

TOTAL EXPENDITURES BY HPC INVESTIGATORS

**| 40.5% |**

TOTAL SPONSORED RESEARCH EXPENDITURES BY INVESTIGATORS USING HPC SERVICES

## RESEARCH DATA CENTER USAGE

PRINCIPAL INVESTIGATORS (PI's) USING HPC SYSTEMS	572
ACTIVE AWARDS USING HPC SYSTEMS	815
TOTAL EXPENDITURES BY HPC INVESTIGATORS	\$196.7M
Top 100 PI's USING HPC	80%

## SUPERCOMPUTING CAPACITY

TOTAL OCELOTE AND EL GATO CAPACITY	13,688 CORES
FACULTY COMPUTE ALLOCATION	43K HRS./MO.





## SUPPORTING STUDENT SUCCESS THROUGH TECHNOLOGY

Student and Academic Technologies partners with faculty, staff, and students to enable innovative instruction and student success.

“The journey mapping session helped us realize how often the university is bombarding students with information. Now we’re more strategic with the UA Clicks presentation, including the most important action items for students before classes start.”

– Elliott Cheu, Ph.D., Interim Dean, College of Science; and Professor of Physics

## JOURNEY MAPPING A DAY IN THE LIFE OF FIRST-YEAR STUDENTS

What does a day in the life of a first-year student look like? And, how is technology supporting them? These were the important questions a group of technologists, staff, and faculty asked former freshmen as part of a three-day Student Journey Mapping workshop led by UITs.



The interactive journey mapping process created shared understanding around what students were feeling, as well as their experiences and challenges navigating the university. It became clear there were opportunities to improve the technology and services for students enabling their success during their first year.

Information collected during the process has shaped Trellis CRM's strategy for supporting students including enhancing their digital experience and ease in connecting to university services and communities. This data is also being used by UITs and other university partners to identify trends, patterns, and opportunities where there is potential to create high value, positive impact for students.

*"There were a lot of things I didn't know as a freshman," said Amy Barrientos, a pre-business sophomore, "but making my voice heard and speaking for students who are in similar situations as me is going to help them in the future."*

## TRELLIS: TRANSFORMING PERSONALIZED, DIGITAL EXPERIENCES

The University of Arizona has launched a Constituent Relationship Management (CRM) initiative, a key component in the University's Strategic Plan. The CRM strategy, supported by software technology, will improve how the university manages its relationships, and the data and information associated with them.

UITs is leading the university-wide CRM program, named Trellis, which officially launched in January 2019. Trellis has set a pace for implementation at speed and scale, debuting two initial software solutions focused on student success, Trellis Advise and Trellis Progress, in fall 2019.

Powered by Salesforce, Trellis is enabling communication, shared processes and information across the University. With a holistic view of relationships, colleges and departments can optimize how they interact with students, faculty, alumni, and industry partners to provide a more modern, personalized digital experience.

Governance over Trellis is a collaborative effort between several cross-campus groups and leaders who help determine the program's strategic direction.



## LEVERAGING VIDEO FOR ONLINE TEACHING AND LEARNING

The University of Arizona has made great strides using online synchronous meeting tools in support of teaching, learning, and business needs.

In FY19, Zoom, a cloud platform for video and audio conferencing, was made available university-wide. Zoom works on wired, Wi-Fi, and 4G connections and delivers conference room quality audio and video.

Zoom's quality, ease of use, and collaboration across the campus IT community greatly increased user adoption. More than 252,000 hours were spent in more than 66,000 Zoom meetings hosted by more than 13,000 faculty, staff, and students.

Video helps to fulfill accreditation requirements by verifying that Arizona Online students are taking exams. More than 50,000 exams were recorded in FY19.

**| 369K HOURS |**  
PANOPTO INSTRUCTOR LECTURE CAPTURE  
AND VIDEO STREAM DELIVERED TO STUDENTS  
IN FY19.

**| 60+ |**  
CLASSROOMS EQUIPPED WITH PANOPTO'S  
REMOTE AND AUTO SETTINGS TO RECORD A  
SEMESTER'S WORTH OF LECTURES.

**| 45 |**  
ZOOM ROOMS CREATED AS CONFERENCE  
ROOMS OR CLASSROOMS

### FY19 METRICS

**D2L LEARNING MANAGEMENT SYSTEM**  
6,097 of the 6,461 courses offered in the university's  
Schedule of Classes had a D2L Course Site **94%**

**CLASSROOMS**  
Collaborative Learning **32**  
Centrally Supported **232**

**OSCR COMPUTER LABS**  
Computer Lab Users **9.3K**

**UACCESS STUDENT (Version 9.0)**  
Financial Aid Disbursed **\$654.5M**  
(18-19 Academic Year)  
Distinct Enrollment Requests **821.6K**  
Modifications Completed **639**

### SERVICES

- UACCESS STUDENT
- CLASSROOM & LAB TECHNOLOGIES
- INSTRUCTIONAL TECHNOLOGIES
- ARIZONA MOBILE APP
- TRELLIS CRM



## LEVERAGING TECHNOLOGY & ADMINISTRATIVE EFFICIENCIES

Administrative Technologies creates and implements innovative technology solutions used to operate and manage the business of the University of Arizona.

“Thanks to the FSO, HR, and UITS teams for streamlining functions in UAccess Employee with the recent upgrade. I just approved time on my phone, iPad, and computer – all three worked seamlessly.”

– Lisa Rulney, Senior Vice President for Business Affairs & Chief Financial Officer

## INTUITIVE, MOBILE, BUSINESS SYSTEM REALIZED

Continuing to make the university's business and administrative systems more efficient and easy to use is a top strategic priority. UAccess Employee, which processes \$1.02B in annual payroll, was recently upgraded to give faculty and staff a more modern, intuitive user experience, making it mobile-friendly on smartphones and tablets. There are also more options for personalizing your experience when viewing, entering, and approving time. A new directory feature displays supervisory relationships in an organizational chart format, making it easier to find and connect with colleagues across the university. The UAccess Employee team worked in partnership with Financial Services Office and Human Resources to make the upgrade a success.

**| \$1.02B |**  
IN ANNUAL PAYROLL

**| 19,955 |**

AVERAGE NUMBER OF PAYCHECKS PROCESSED WITHIN UACCESS EMPLOYEE EVERY PAY PERIOD

### TRAVEL AUTHORIZATION GOES PAPERLESS

As part of the university's Strategic Plan - Pillar 5, UITs collaborated with the Financial Services Travel Office to improve the travel authorization process. Gone are the days of paper forms for travel requests and many hours of administrative processing thanks to Adobe Sign, the new electronic routing tool for approving travel on university business.

**| 25,942 |**

TRAVEL REIMBURSEMENTS PROCESSED IN FY19



### SERVICES

- UACCESS FINANCIALS
- UACCESS EMPLOYEE + UACCESS LEARNING
- UACCESS RESEARCH

### LOOKING FORWARD: KUALI FINANCIALS MODERNIZATION

The Division of Business Affairs and UITs have launched a multi-phase initiative to modernize the university's financial system. This initiative will further align campus business and financial operations with its strategic direction and benefit all faculty and staff engaged in budgeting and financial management. The project will include a readiness assessment, redesign of the university's financial chart of accounts and streamlining business procedures and processes. Implementing these modernization enhancements will occur over a four-year timeline from planning to implementation.



### FY19 METRICS

#### UACCESS RESEARCH (Kuali 5.2.1)

Active Awards 2.2K

#### UACCESS FINANCIALS (Kuali Version 7)

P Card Transactions 230.6K  
Accounts 21.5K  
Average Daily Unique Visitors (business days only) 1.2K

#### UACCESS EMPLOYEE (Version 9.2)

Total Payroll Amount Processed \$1.02B  
Average Daily Unique Visitors (business days only) 3.8K



## CAMPUS PARTNERSHIPS FOR TECHNOLOGY SOLUTIONS

Campus IT Partnerships connects the university's IT community members, resources, and clients across the institution.

“With my many years of experience launching complex sites, this was the most well-run launch I have been involved in.”

– Paulo Goes, Ph.D., Dean, Eller College of Management; Halle Chair in Leadership; Professor of Management Information Systems; and Co-Director, INSITE: Center for Business Intelligence and Analytics

## CAMPUS WEB SERVICES MODELS CAMPUS COLLABORATION



Extensive collaboration between Campus Web Services and the UArizona Digital community of campus web developers has led to a suite of branded, mobile responsive, accessible and easy-to-use web solutions. This year, the Campus Web Services team furthered rapid university adoption of website best practices.

Campus Web Services demonstrated collaboration in action with the redesign of the Eller College of Management website. This redesign involved the consolidation of the main Eller site with 36 schools, departments, centers and lab sites, which included over 6,800 pages, 1,500 redirects, 90 domains and 40+ website contributors. This project involved contributions across many teams and thrilled Eller staff who were able to leverage university Digital resources.

Delivering flexible, scalable low-cost shared web resources that are optimized for user experience, information security and regulatory compliance allow campus units to focus on their content differentiation strategy.

### Recognition:

- UArizona Digital Team nominated for University Award for Excellence, based on their cross-campus collaboration on the Quickstart platform.
- Arizona.edu ranked #4 among the best university websites. (Source: Convince and Convert, 2019)

### CAMPUS WEBSITE SUPPORT

Websites Supported	474
Websites Launched in 2019	69
Service Requests	1.2K
Campus websites that have adopted Quickstart	200+

### UASERVICE EXPANDS FOOTPRINT

11 campus units are using UAService, a request and tracking solution providing real-time and historical data. This tool manages information security incidents, technical self-help articles, and directed workflows and approvals. It also handles financial aid requests and tracks equipment in centrally scheduled classrooms. In FY20, UAService will begin to process service alerts for technical system outages and maintenance, and asset management. UAService is governed by a group of campus partners and operated by UITs.

### 6TH ANNUAL IT SUMMIT

- 600 IT and related professionals from across campus
- 47 breakout sessions
- 12 poster presentations
- 14 interactive workshops
- Hackfest
- AR/VR Showcase



### SERVICES

- CAMPUS OUTREACH
- CAMPUS WEB SERVICES
- 24/7 IT SUPPORT CENTER
- DESKTOP SUPPORT (FEE-BASED)
- SOFTWARE
  - EMAIL
  - WINDOWS/OFFICE
  - ADOBE
  - BOX
  - RED HAT LINUX
  - ACTIVE DIRECTORY
  - ZOOM

## 24/7 IT SUPPORT CENTER IS COMMITTED TO CUSTOMERS



The 24/7 IT Support Center continues to provide anytime, anywhere technical support to the university's diverse student and employee populations. With the roll-out of new services, such as NetID+ two-factor authentication for faculty, staff and students, the demand for IT support continued to increase in FY2019 to 111,055 requests. Still, customer wait times averaged less than 60 seconds.

24/7 IT Support Team is a leader in providing exceptional customer service support. On metrics measuring courtesy, knowledge, timeliness, and overall quality, the 24/7 Team outperformed both industry and higher education.

### FEEDBACK SCORE AVERAGES

24/7 IT Support Center	4.86 / 5.00
Industry average	4.78 / 5.00
Higher education average	4.80 / 5.00

### FY19 SUPPORT REQUESTS

Phone Calls	76.0K
Chat Support	19.8K
Walk-in Support	9.2K
Email or UAService Requests	5.8K

**111K**  
REQUESTS FOR SUPPORT

24/7

# STUDENT CENTERED LEARNING WITH TRANSFORMATIVE TECHNOLOGIES

## MAKING HIGHER EDUCATION ACCESSIBLE THROUGH TECHNOLOGY

The College of Education wanted to provide a richer learning experience and increase the level of engagement for in-person and remote students.

To create a true student-centered learning environment, Michael Griffith, director of instructional and learning technology with the College of Education, recently introduced a telepresence robot that integrates into Zoom software.

The Kubi is a robotic neck attached to a tripod that holds an iPad with a directional microphone and speaker through which a student can be video-conferenced into a classroom. The remote students can control the iPad's direction to focus on whatever they want and interact with the class.

Griffith is pleased with the high engagement level of remote students using Kubi robots. He explains, "The important thing is it's all student centered. If they want to look at the projected material on the slides, or want to turn to their classmate they can.

We knew we had the right technology mix when remote students started connecting early so they could talk to their friends in the hall before class."

It takes time for the remote student to get used to the controls and it takes time for in-class students to get used to having participants who are not physically present. Griffith explains that success is when students stop seeing the robot and they start seeing their classmates.

*"We are absolutely dedicated to having a diverse student population. That means not only the standard definitions of diversity, but also students of different capabilities. The technologies we implement are all about how we get students to engage and be able to participate fully in their programs without regard to their physical location or physical capabilities."*

— Michael Griffith, Director, Instructional Learning Technologies, College of Education



## NEW REMOTE ACCESS 3D PRINTING EMPOWERS STUDENT LEARNING

The College of Architecture, Planning and Landscape Architecture (CAPLA) recently stepped into a new era of using technology to bring remote capability to 3D printing. Students can use the equipment any time, from almost anywhere, whether they're at home or on campus, as long as they can access the Internet.

3D printing can be time intensive, taking five hours or more per project. CAPLA laboratory manager Paulus Musters found that students would often send their project to print and walk away. If problems occurred with their design and printing was not stopped, the printer could get congested with excess material and be unavailable for days.

To resolve this, Musters collaborated with an innovative national Maker team to develop a cloud application that accesses the 3D printer. Now students can watch their printing via their mobile device. If an error occurs, they can use the app to immediately halt the printer and resubmit their project once they have resolved the design issue.

Before this new technology was implemented, students would have to physically come to the lab to start their 3D printing project. With the new remote access feature, students have what they need "on demand."

Mr. Musters sees a lot of success with the addition of the software and remote capabilities for students.

*"What I wanted to do is give them control and the knowledge to control the 3D printers. Before now, we had to hire a hands-on person to interface with the printers. But now, the students themselves will operate the machine. They have become active participants as they learn about it and do it. They're in charge of it all!"*

— Paulus Musters, CAPLA Lab Manager





## CREATING A CULTURE OF SECURITY AWARENESS

The Information Security Office provides policies, tools and processes to protect the information resources of the University of Arizona, using a shared responsibility model.

“Because ISO engaged so many stakeholders early on and was very inclusive in the security policy process, the final approval went really smoothly.”

— Celina Ramirez, Vice President for University Initiatives

## COLLABORATION ON SECURITY POLICIES

The Information Security Office (ISO) created 17 new policies through a highly collaborative process that included students, faculty, executive leadership and IT staff from many colleges and departments. The ISO Policy Working Group membership included 39 staff spanning 18 departments and colleges. UArizona's Chief Information Security Officer and Chief Compliance Officer joined together to champion the approval process, ensuring a smooth journey.

"The ISO team is smart and committed to the work that they do. They were very organized and that made the approval process easier. People had such trust and confidence, because they saw that there had been this really comprehensive process on the front end," said Celina Ramirez, University of Arizona Chief Compliance Officer.

## INCIDENT RESPONSE: A SHARED RESPONSIBILITY MODEL

One of the key aspects of the Information Security Office is to establish and support a shared responsibility model to improve the University's security posture. ISO helps departments prepare, improve, and if necessary, respond to security events.

The Security Operations Center (SOC) has multiple specialized tools that block the majority of attacks. If the team determines that an attack is not being blocked, they work in collaboration with departmental security managers to analyze the impact and scope of the attack, as well as to develop recommendations or countermeasures. Because cyber attacks happen relentlessly, the SOC remains available as a resource to campus 24/7/365.

## EMPLOYEE SECURITY AWARENESS TRAINING UPDATED



Required Employee Security Awareness Training was updated with a new online format this year. The new training was created by the ISO team in collaboration with a group of 12 staff from across campus. The easy step by step format gave employees environmental awareness to many of the current data security threats facing Internet users.

**| 10,237 |**  
FULL-TIME EMPLOYEES COMPLETED THE TRAINING AS OF JUNE 2019

## UNIVERSAL NETID+ TWO-FACTOR AUTHENTICATION

The University of Arizona was the first Research 1 university to require universal two-factor authentication (NetID+) for faculty and staff in FY18 and for students more recently in FY19. Until this requirement, over 40% of students had no two-factor protection on their campus account. Now compromised accounts are down 90%.

**| 95% |**  
ENROLLED IN TWO-FACTOR AUTHENTICATION

Students	52,288
Staff	11,254
Faculty	3,199

## CRYPTOCURRENCY MINING BLOCKS 4.3M

Crypto-mining is a way in which cryptocurrency is earned by solving complicated mathematical problems in competition with other miners. This decentralized global currency can be used as payment across the web, including unmonitored areas (dark web). Complex crypto-mining software is often transferred through malware, infecting host systems, with the intention of more widespread mining and in turn, greater coin earning for hackers.

## FIREWALL (BORDER) BLOCKS

Firewall Blocks 21M/daily

## SECURITY MONITORING

Data Monitored 36.3 terabytes

## EMAIL SECURITY APPLIANCE

Phishing and Spam Emails Blocked 4.5M/daily

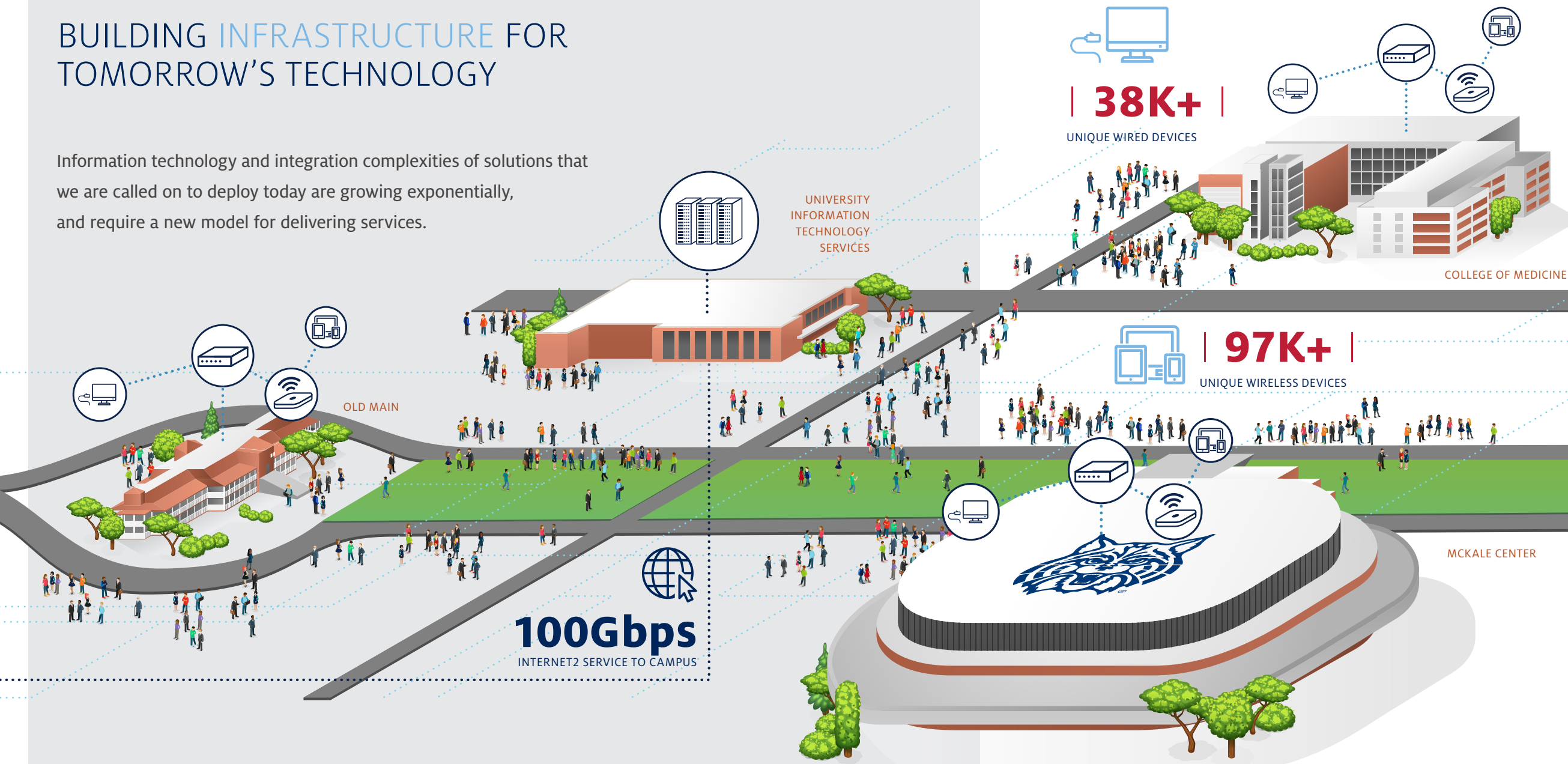
## SERVICES

- COMPLIANCE SERVICES
- SECURITY ARCHITECTURE
- INCIDENT RESPONSE /SECURITY OPERATIONS
- TRAINING
- SECURITY MONITORING



## BUILDING INFRASTRUCTURE FOR TOMORROW'S TECHNOLOGY

Information technology and integration complexities of solutions that we are called on to deploy today are growing exponentially, and require a new model for delivering services.



### TECHNOLOGY BEHIND BUILDING REDESIGN & CONSTRUCTION

The UITs Estimating and Engineering team had close to \$4 million in construction management during FY19. Large infrastructure projects included network design and installation in the Health Sciences Innovation Building, Cole and Jeannie Davis Indoor Sports Arena, Oro Valley Veterinary Medicine Facility, and Hillenbrand Softball Stadium & Aquatics Center among others.

**38** | CORE NETWORK DEVICES  
1-2 years old

**2,110** | ROUTERS + SWITCHES CAMPUS WIDE  
735 are 7-16 years old (obsolete)

**10,082** | WI-FI ACCESS POINTS CAMPUS WIDE  
up to 5 years old

## BUILDING CUSTOMER-CENTRICITY INTO OUR SERVICE PLATFORM

For decades, the organizational structure of technology has been that of silos, driven by elements based on tasks. UITs recently shifted to a Plan, Build, Run organizational structure that focuses on a successful service development and delivery lifecycle rather than one individual element or component. The Build team, for example, now encompasses some members of the platforms team.

This type of arrangement creates a cross-functional, 360 perspective of the service being developed. The organizational change is more than moving managers around though. It's injecting a more service-oriented culture and integrating outcomes that we deliver upon. It's also about creating the opportunity to break down the pillars of separation in traditional Information technology organizations.

"This new structure empowers our teams to work more effectively between the technology elements of network and data center operations, application development, project management, support and field services," explains Derek Masseth, Chief Technology Officer.

### SERVICES

- NETWORK CORE & INTERNET2 ISP
- CAMPUS DATA NETWORK
- VOICE SERVICES
- NETWORK MANAGEMENT
- NETWORK & DATA CENTER OPERATIONS

# EVOLUTION OF CLOUD SERVICES AT THE UNIVERSITY OF ARIZONA

## CLOUD OPTIMIZATION INCREASES EFFICIENCY

In FY18, UITS completed the successful migration of all its enterprise applications to the cloud, yielding approximately \$3 million in annual refresh cost savings. In FY19 UITS continued to mature its cloud services by launching a public cloud optimization initiative to increase efficiency and further reduce its cloud spend. Cost and usage data were used to understand past usage patterns of compute resources and predict future capacity needs.

Fully leveraging the elasticity of cloud services included terminating idle resources and scheduling the shutdown of development and test resources during non-business hours. Resources that were heavily utilized or always “on” provided savings opportunities via reserved instances. Understanding multi-dimensional cost and usage data, service level agreements, and capacity requirements were key to ensuring a high level of service while operating fiscally responsible.

## CLOUD ELASTICITY = COST SAVINGS

The cloud enables high levels of elasticity which allows our applications to scale up and down to match demand. We reserve 24 compute cores over the course of a year at an average of 30% discount and can lease servers on an hourly basis during levels of high demand such as the start of the school year and priority registration. By scaling the UAccess Student system up and down during high times of demand and making reservations for our baseline usage, we effectively saved an additional \$60,000 (see chart). Aggregate savings for all of our systems using smart reservations totaled \$300,000 in FY19.

## CLOUD-OPS SPEED OF DELIVERY

UITS established an operations-as-a-service program, CloudOps, to transition IT operations to a more service-delivery focused platform in FY19. The CloudOps team includes members of various UITS units dedicated to providing expertise, experience, and best practices to the university’s IT services. They engage with colleges and departments to take advantage of the self-service format for operations services such as serverless website, data management, Windows and Linux server deployment and more.

## CLOUD SECURITY

Key to the CloudOps offering, is consistency in security features, monitoring, managed backups, 24/7 alerting and support. Security and compliance becomes a shared responsibility that relieves the constituent of an operational burden. Cloud providers like AWS take responsibility for protecting the infrastructure. The university takes responsibility for building and securely using cloud services.



**| \$1,784,000 |**  
CAMPUS EXPENDITURE FY19

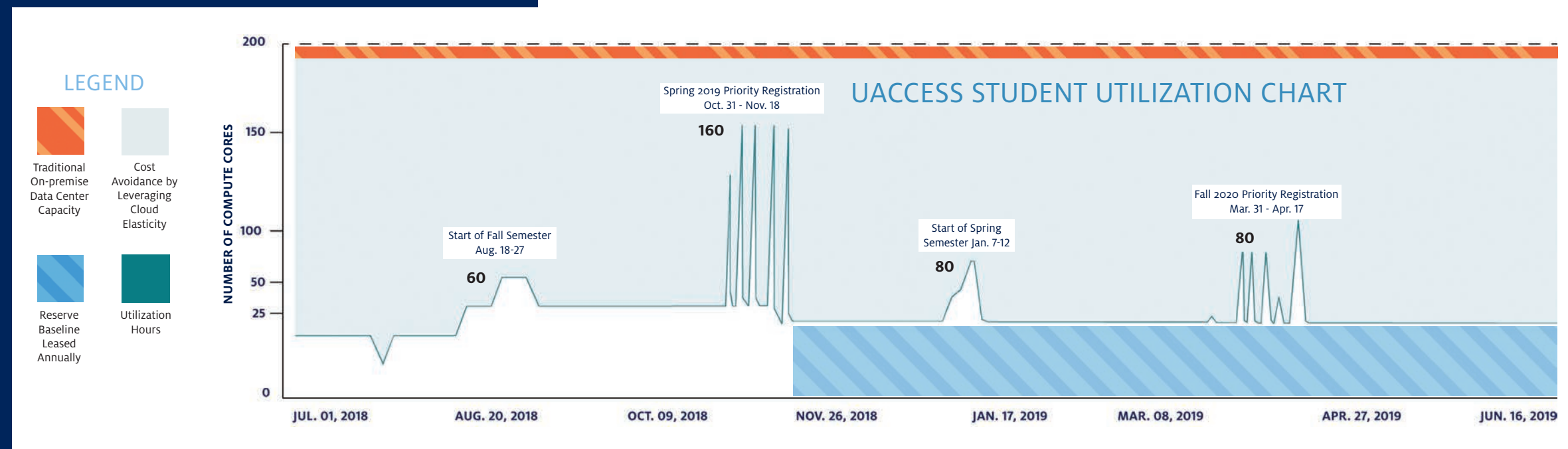


**| 275,000 |**  
TOTAL USER ACCOUNTS



**| \$300,000 |**  
ANNUAL COST SAVINGS ON COMPUTE, DATABASE, AND DATA WAREHOUSE RESOURCES IN FY19, WHICH CAN BE REINVESTED IN THE UNIVERSITY

**| 40,255 |**  
TOTAL USER ACCOUNTS





**EMPOWERING DECISION MAKING  
THROUGH DATA ANALYTICS**

University Analytics & Institutional Research provides data that empowers campus decision makers, informs policy and practice, and tells the University of Arizona story.

“I’ve always been impressed with UAIR’s ability to work through the nuanced business processes inherent to our complex and ever-changing institution.”

– Jim Florian, Associate Vice President, Institutional Analysis, Office of the Provost

## STUDENT CENSUS REPORTING MADE EASY



Each year, 21 days from the start of the Fall semester, UAIR compiles the university's student census report based on the number of enrolled students. This data includes demographic detail about the student body, as well as student outcomes such as retention and graduation rates. Campus stakeholders use this census data to track annual enrollment trends, conduct financial analysis, and make future academic and administrative planning decisions. This data is also used for benchmarking, peer analysis and university rankings.

In FY19, UAIR developed new automated reporting capabilities to provide census data the day after the census date along with a printed census report to Enrollment Management. This development is the result of two months of work ahead of the census date to ensure data accuracy in partnership with Enrollment Management. The current census reporting process is now a push button task, representing a significant achievement.

*"UAIR has truly made a difference for Enrollment Management! For many years, I envied the dashboards I saw my colleagues at different institutions use for their data needs in enrollment. Today, I am the one envied for the resources I have at my fingertips thanks to UAIR's dedicated focus on reliable and accessible data."*

– Dr. Kasey Urquidez, Vice President, Enrollment Management and Dean, Undergraduate Admissions

**| 45,217 |**

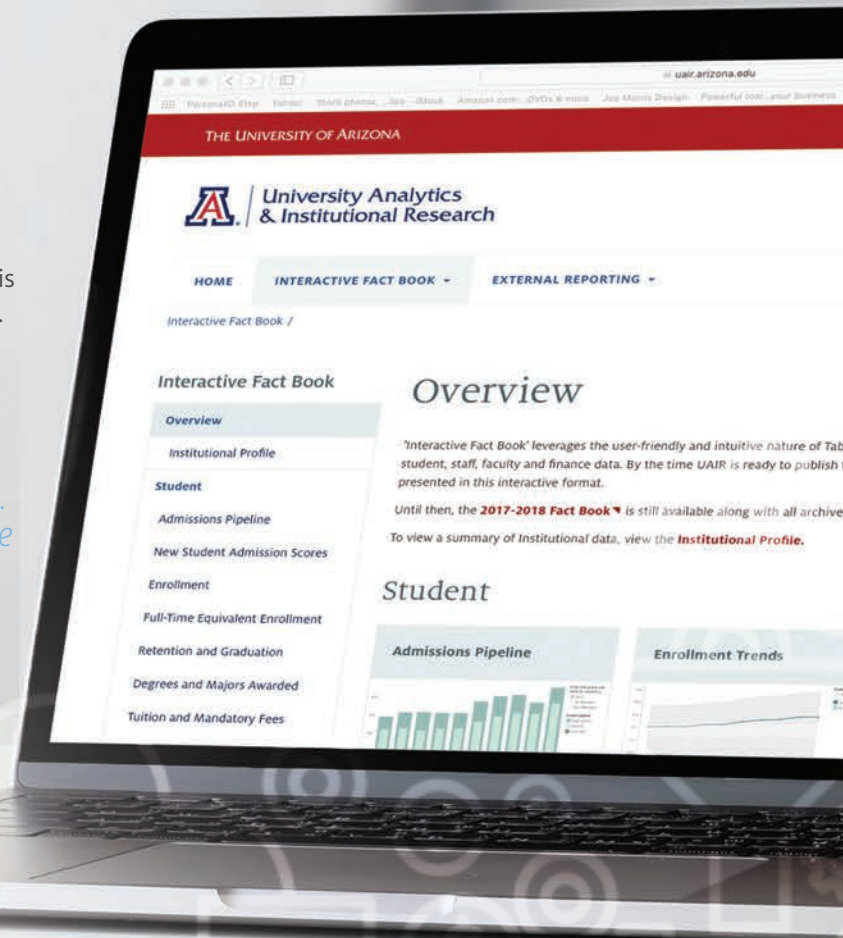
AS OF THE FALL 2018 CENSUS DATE, 45,217 TOTAL STUDENTS WERE ENROLLED AT UNIVERSITY OF ARIZONA, INCLUDING 35,233 UNDERGRADUATES AND 9,984 GRADUATE STUDENTS.

## UNIVERSITY DATA AT YOUR FINGERTIPS

Gaining access to university data got easier this year when UAIR completed a major upgrade to its website, featuring a modern design, layout, and user-friendly Fact Book.

The new Fact Book contains a series of interactive dashboards, powered by Tableau software. Some of the data available includes snapshots of student, staff, faculty, research and finance data.

Interactive Fact Book was rolled out in FY19 and UAIR staff are actively working on adding data points.



## UAIR JOINS CIO DIVISION FOR BETTER ALIGNMENT WITH CAMPUS NEEDS

In January 2019, UAIR began operating under the direction of the CIO. The synergy created from this alignment has been a good fit for the university. As part of this transition, UAIR reorganized to better serve its campus customers in the areas of student and administrative data services as well as dedicated roles for customer support and communications.

## DATA WAREHOUSE ENHANCEMENT UNDERWAY

UAIR is actively supporting the university's Strategic Plan by taking many steps to enhance the current data warehouse and ensure that the right data is available to all campus partners at the right time. These steps include bringing in new data from various surveys and systems and making standardized institutional data more easily accessible. New, intuitive reporting tools are being implemented to deliver accurate and timely high-level data to university decision makers. Work began on this initiative in FY19 and will be completed by FY20.

### SERVICES

- EMPLOYEE
- STUDENT
- FINANCIALS
- BUDGET
- RESEARCH
- SPACE
- WEBSITE/INTERACTIVE FACT BOOK
- EXTERNAL REPORTING
- MANAGERIAL REPORTING  
(strategic Initiative 5.2A3 Data Warehouse)

### DID YOU KNOW?

**| 80% |**

OF QUERIES IN UACCESS ANALYTICS WERE COMPLETED IN UNDER 2 SECONDS



**| 30,264 |**

ANALYTICS QUERIES RUN EACH DAY

### FY 19 METRICS

#### UACCESS ANALYTICS

Active Users	5.0K
Active Subject Areas	196
Reports Run	8.3M
Nightly ETL Jobs	11.0K
Active Dashboard Pages	5.0K

#### EXTERNAL REPORTING

Total Surveys	108
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# HIGHER EDUCATION IT FUNDING COMPARISON

The University of Arizona, a land-grant university with two independently accredited medical schools, is one of the nation's top public universities in the U.S. News & World Report (USNWR) national university rankings. The university is also ranked in the top 25 in research expenditures among all public institutions, according to the National Science Foundation in FY17. UArizona is a member of the Association of American Universities (AAU) representing 63 leading public and private research universities in the U.S.

Information technology at the University of Arizona operates very effectively even though it has 32% fewer IT staff than our public AAU peers. Arizona has very strong partnerships between central and campus IT communities providing highly efficient support and services to faculty, staff, and students.

	University of Arizona	ABOR Peers	Public AAU	Public Land Grant Institutions	Public MD-Granting Institutions	USNews Public Top 50 (2019)
Number of Institutions	1	15	33	67	90	50
<b>Institution FTE</b>						
Student FTE <sup>1</sup>	39.3 K	43.4 K	36.5 K	22.1 K	22.1 K	31.3 K
Faculty FTE <sup>2</sup>	2.5 K	3.8 K	3.2 K	1.8 K	2.2 K	2.6 K
<b>Institution Expenditures</b>						
Research Expenditures <sup>3</sup>	\$ 622.2 M	\$ 855.9 M	\$ 683.7 M	\$ 294.6 M	\$ 348.0 M	\$ 524.4 M
Total Expenditures <sup>4</sup> (net of hospital)	\$ 2.0 B	\$ 3.0 B	\$ 2.3 B	\$ 1.1 B	\$ 1.3 B	\$ 1.9 B
<b>IT FTE<sup>5</sup></b>						
Central IT FTE	239.6	375.2	345.4	213.2	241.3	310.2
Campus IT FTE	464.0	745.5	642.6	266.6	379.6	517.7
Total IT FTE	703.6	1,078.5	967.3	466.8	615.5	821.0
<b>IT Expenditures<sup>5</sup></b>						
Central IT Expenditures	\$ 62.9 M	\$ 77.0 M	\$ 69.9 M	\$ 41.7 M	\$ 46.1 M	\$ 60.3 M
Campus IT Expenditures	\$ 66.7 M	\$ 139.2 M	\$ 96.9 M	\$ 46.1 M	\$ 72.5 M	\$ 87.6 M
Total IT Expenditures	\$ 129.6 M	\$ 202.6 M	\$ 158.1 M	\$ 84.2 M	\$ 123.6 M	\$ 146.5 M
<b>IT FTE Ratios</b>						
Ratio: Central IT FTE per 1,000 Student FTE	6.1	9.2	9.7	7.8	13.6	9.6
Ratio: Campus IT FTE per 1,000 Student FTE	11.8	17.2	17.3	8.9	11.8	14.7
Ratio: Total IT FTE per 1,000 Student FTE	17.9	25.0	26.4	16.1	22.8	23.8

Sources:  
<sup>1</sup> Integrated Postsecondary Education Data System (IPEDS) - Spring 2018, Fall Enrollment Component  
<sup>2</sup> IPEDS - Spring 2018, Human Resources Component  
<sup>3</sup> NSF Higher Education Research and Development Survey FY17  
<sup>4</sup> IPEDS Spring 2018, Finance Component  
<sup>5</sup> Educause Core Data Service Survey FY18

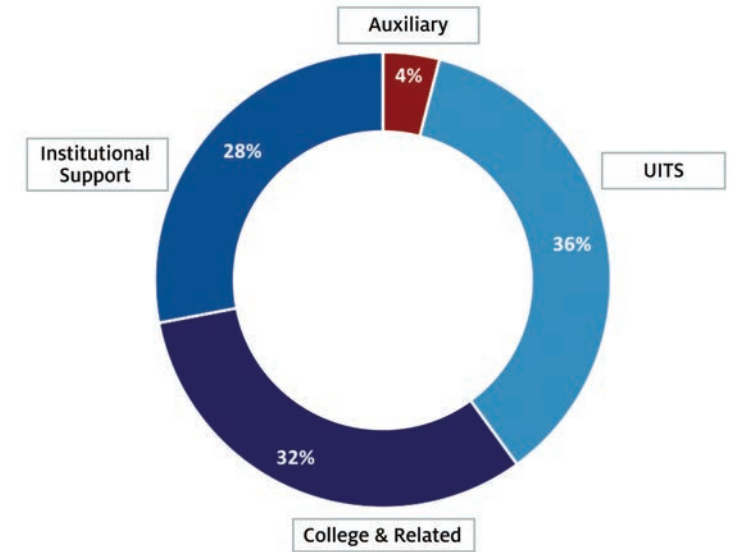
# INFORMATION TECHNOLOGY FTE ANALYSIS

The University of Arizona's IT community is comprised of 760.6 professionals across central and distributed job functions that support college, institutional, auxiliary, and enterprise-wide services.

This past year, UITs partnered with the central Human Resources University Career Architecture Project (UCAP) team to lead over 20 calibration sessions with IT leaders and managers to review position mapping at the organizational and functional level and identify mapping trends and outliers. 19 IT job families were identified through this campus-wide process.

The table below shows an aggregation of several IT job families of similar functions combined for the purpose of comparison.

IT FTE PERCENTAGE TOTALS BY RCU GROUP



Expenditures	Campus RCU Groups <sup>3</sup>				Totals
	UITs	College & Related	Institutional Support	Auxiliary	
IT Equipment <sup>1</sup>	\$11,807	\$1,722,986	\$299,064	\$46,873	\$2,080,730

IT FTE by Job Family<sup>2</sup>

Job Family	UITs	College & Related	Institutional Support	Auxiliary	Totals
IT Support	54.9	95.8	47.5	11.0	209.2
IT Infrastructure	38.0	43.6	24.6	12.0	118.2
IT Network	34.0	2.4	1.0	0.0	37.4
IT Security	14.0	0.0	1.0	0.0	15.0
IT ProjectMgmt	20.0	2.0	2.0	1.0	25.0
IT AppDev	67.9	33.6	71.0	3.0	175.5
IT WebDev	4.0	24.4	25.7	4.0	58.1
IT Instructional Tech	12.0	23.8	12.0	0.0	47.8
IT Analysis	27.5	17.1	26.0	3.8	74.4
<b>Grand Total</b>	<b>272.3</b>	<b>242.8</b>	<b>210.8</b>	<b>34.8</b>	<b>760.6</b>

Sources:  
<sup>1</sup> FY19 Object Code 7620  
<sup>2</sup> University Career Architecture Project (UCAP) aggregation of IT Job Families - September 2019  
<sup>3</sup> Responsibility Centered Management (RCM) Institutional Categories  
 NOTE: Institutional Support Group includes Facilities, Research, Strategic Investments and Student Services groups.  
 NOTE: UITs has additional employees in other non IT UCAP job families not represented above.

# UITS FY19 IT PERSONNEL

University Information Technology Services operates and manages central IT services for University of Arizona faculty, staff and students. Within the division, there are 272.3 total IT FTEs represented in UCAP IT job families.

**UCAP IT Job Families'**

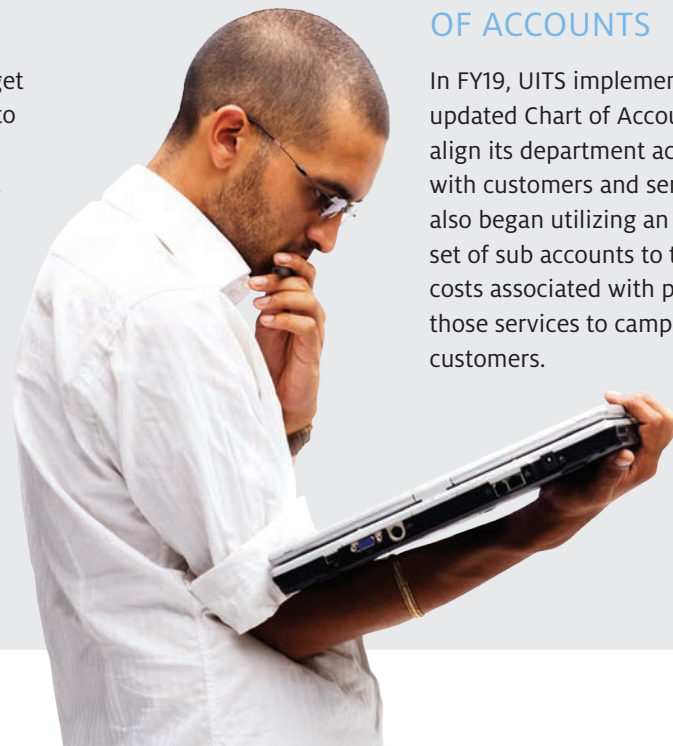
UITS Departments	IT Support	IT Infrastructure	IT Network	IT Security	IT Project Mgmt	IT AppDev	IT WebDev	IT Instructional Tech	IT Analysis	FTE TOTAL
Infrastructure & Foundational Technologies	11	30	34		7	1				<b>83</b>
Student & Academic Technologies	5	2			5	34.9		12		<b>58.9</b>
Campus IT Partnerships	33.9	3		3	6	3	4	4		<b>52.9</b>
UAIR	2	2							27.5	<b>31.5</b>
Admin Technologies	1				1	28				<b>30</b>
Information Security Office	2			10						<b>12</b>
Research Technologies		1		1	1	1				<b>4</b>
<b>Job Function TOTALS</b>	<b>54.9</b>	<b>38</b>	<b>34</b>	<b>14</b>	<b>20</b>	<b>67.9</b>	<b>4</b>	<b>12</b>	<b>27.5</b>	<b>272.3</b>

Source:  
 1 University Career Architecture Project (UCAP) aggregated IT Job Families - September 2019  
 NOTE: UITS has additional employees in other non IT UCAP job families not represented above.

## ENTERPRISE SOFTWARE COSTS

On behalf of the university, UITS licenses software in bulk to get unit-level discounts. As the university grows, the license cost to provide software also increases. On average, between 2013 – 2018 enterprise-wide software costs increased by nearly 80%.

**| \$5M |** 2013 ENTERPRISE SOFTWARE COSTS  
**| \$9M |** 2018 ENTERPRISE SOFTWARE COSTS



## UPDATED CHART OF ACCOUNTS

In FY19, UITS implemented an updated Chart of Accounts to align its department accounts with customers and services. It also began utilizing an updated set of sub accounts to track the costs associated with providing those services to campus customers.

## STUDENT INFORMATION TECHNOLOGY FEE

University students have high expectations for learning and living in today's digital environment. They pay a mandatory annual fee which is used to enhance the university's student learning environment and increases Arizona's capacities to meet digital environment expectations.

The Information Technology/Library (ITL) Fee was approved by the Arizona Board of Regents in March 2006. The IT portion of the fee supports modern technology requirements such as wireless access in high-traffic public locations, all campus outdoor areas, enhanced digital classrooms and more.

**| \$776 |**  
 PER FTE ANNUALLY

## COMMUNICATION USER FTE NETWORK

The Communication User FTE Network Funding Model is the mechanism by which UITS recovers a portion of the costs of providing data and voice connectivity to University of Arizona campus customers. This model is based on Full Time Equivalent (FTE) employees. For FY19, the FTE Rate was \$776 per FTE.

**| \$8.8M |**  
 END OF LIFE NETWORK EQUIPMENT

## DEFERRED MAINTENANCE COSTS

The university has accumulated deferred network infrastructure maintenance due to the lack of increase in the FTE fee since 2008. The replacement cost of the network equipment currently deployed on campus is \$29 Million, \$8.8 million of which is end of life and needs to be refreshed.

**\$149**

PAID PER STUDENT PER SEMESTER

\*Fee for students entering FY2019 and beyond

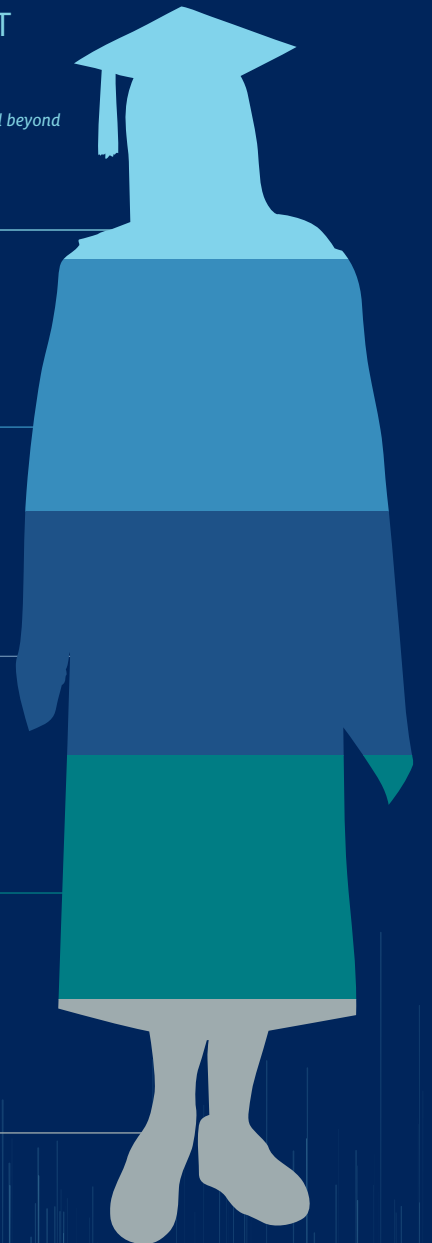
**NETWORK**  
**\$47.71**

**ACADEMIC TECH**  
**\$46.62**

**IT SUPPORT**  
**\$28.02**

**STUDENT TECH**  
**\$24.19**

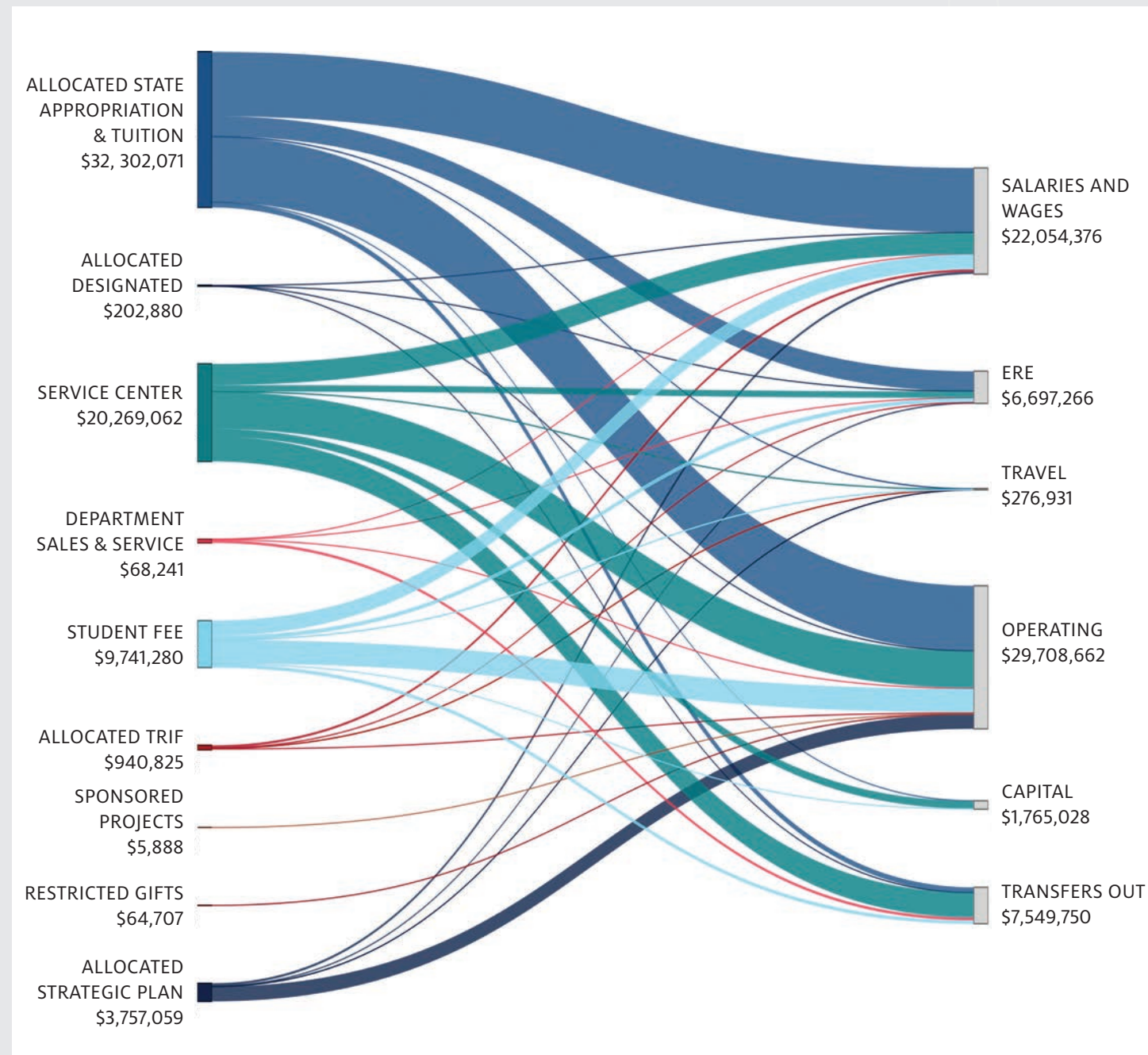
**SOFTWARE**  
**\$2.46**



# UITS FY19 EXPENDITURES BY SOURCE



Univerity Information Technology Services (UITS) manages an annual budget of approximately \$68.0 million to provide a portfolio of IT services to the university community that support the teaching, learning and research mission. The graphic below illustrates UITS expenditures by fund source for FY19. UITS is committed to transparency and accountability, and works to ensure that limited resources are allocated to the highest strategic priorities of the university.



# EXECUTIVE LEADERSHIP TEAM



**BARRY BRUMMUND**  
Chief Information Officer



**LAURA BRACAMONTE**  
Executive Assistant to the CIO



**THOMAS BOURGEOIS**  
Executive Director,  
Campus IT Partnerships



**MARISELA CELAYA**  
Assistant Director, Human  
Resources & Organizational  
Development; Vice Chair,  
Senior Leadership Team



**RAVNEET CHADHA**  
Interim Executive Director,  
University Analytics &  
Institutional Research



**LANITA COLLETTE**  
Chief Information  
Security Officer



**JEREMY FRUMKIN**  
Executive Director,  
Research Technologies



**SUSAN LEGG**  
Director, IT Service Management  
Chair, Senior Leadership Team



**DEREK MASSETH**  
Chief Technology Officer



**TIMOTHY SCHWAB**  
Executive Director,  
Administrative Technologies



**KELLY SOUTH**  
Senior Director,  
Communications & Marketing



**DARCY VAN PATTEN**  
Executive Director, Student  
& Academic Technologies



THE UNIVERSITY OF ARIZONA

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