



Information Technology

STRATEGIC PRIORITIES

FY2020 – FY2024



Traditional ways of delivering IT services are being disrupted by innovative and agile solutions. Researchers, faculty, and students interact less through brick-and-mortar spaces, and more through a complex network of mobile technologies and collaboration tools. Shared Services make it possible to deliver services such as email, hosted services and cloud storage better and at lower cost. By creating business value through cost-effective IT solutions, UIT supports the University Goals of National Competitiveness, Student Success, Community Advancement and Athletic Competitiveness. Strategic planning, effective resource management and collaboration with our UH community will continue to shape the way we deliver IT value.

- Dr. Dennis Fouty



UNIVERSITY INFORMATION TECHNOLOGY

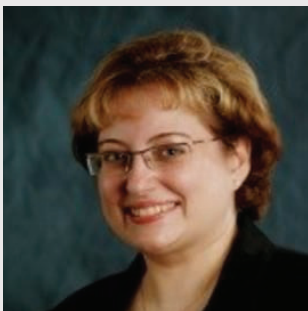
UIT ORGANIZATION



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Associate Vice Chancellor, UH System
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STRATEGIC PRIORITIES

FY2020-FY2024

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MISSION, VISION, FOCUS

Mission and Overarching Goals

Our mission is to serve our University's colleges and administrative departments by focusing on three overarching goals:

1. Deliver a suite of highly reliable and secure technology services
2. Align with and serve our campus customers
3. Support state-of-the-art student, financial, human resources and other information systems

Vision

Create value across the UH System by investing in infrastructure capacity and security, collaborative tools and newer, more efficient and greener technologies to enable growth in services and protect revenue.

Strategic Focus

1. Create a reliable, secure, robust and cost-effective technology environment using industry best practices and technology
2. Maintain the high performance campus network infrastructure and a robust wireless footprint
3. Aggressively enhance security at the enterprise level and in customer environments
4. Actively pursue opportunities with UH business owners to leverage enterprise applications services and functionality

We endeavor to achieve these objectives by:

1. Engaging leadership in planning via our strategic priorities and our 10-year UIT Infrastructure forecast
2. Creating a federation of university IT providers
3. Developing and deploying UIT methodologies to the campus
4. Establishing UIT customer service assurance
5. Partnering with academic and administrative groups
6. Improving and streamlining our internal processes and structures
7. Increasing the credibility of UIT

OVERVIEW

Our IT Services and Summary of Operations

UIT provides IT services to the UH System and UH. We are responsible for the management of:

- The University's Communications Infrastructure and Telecommunication Services
- The UHS Data Center
- Information Technology Security
- Enterprise Systems and Services
- Educational Technology Services (*General Purpose Classrooms*)
- Web Technologies and Applications
- IT Support Services (*including Helpdesk and the UH Contact Center*)
- Research Computing Services

The comprehensive list of services is available in our UIT Service Portfolio at <http://www.uh.edu/infotech/about/performance/service-management/>

In addition, we monitor the performance of our services daily. The table below is our 3-year Summary of Operations, which contains key performance indicators (KPIs) for major services.

UIT SUMMARY OF OPERATIONS FY2016-FY2018

| SERVICES | FY16 | FY18 | % CHANGE |
|---|-------------|-------------|----------|
| Enterprise Information Systems | | | |
| Finance Transactions | 4,256,383 | 4,492,918 | 6% |
| HR / Payroll Transactions | 5,792,495 | 6,925,681 | 20% |
| P-Card Transactions | 83,652 | 73,854 | -12% |
| Desktop Computing & User Support Services | | | |
| IT Support Center Service Requests | 65,793 | 60,794 | 8% |
| IT Communications Service Requests | 1,472 | 1,635 | 11% |
| Classroom Technology Equipment Requests | 1,178 | 486 | -59% |
| Classroom Technology Equipment Repairs | 130 | 66 | -49% |
| Enterprise Infrastructure and Services | | | |
| Email Accounts | 18,961 | 19,594 | 3% |
| CougarNet Accounts | 110,453 | 102,879 | -7% |
| Email Aliases | 351,357 | 404,593 | 15% |
| Email Incoming Messages Processed | 154,939,368 | 889,333,000 | 474% |
| Information Technology Security | | | |
| Security Incidents | 150 | 486 | 224% |
| Instructional Technology | | | |
| Blackboard Seats | 151,189 | 114,576 | -24% |
| Blackboard Courses | 5,344 | 3,460 | -35% |
| Network Infrastructure and Services | | | |
| Active Data Ports | 75,288 | 85,099 | 13% |
| Total Miles of Fiber Cable | 1,195 | 1,930 | 62% |
| # of WiFi Access Points | 4,963 | 5,165 | 4% |
| Operations & Data Center | | | |
| Data Backup in Terabytes | 6,656 | 8,618 | 29% |
| UNIX Servers, Logical Systems | 414 | 369 | -11% |
| Windows Servers, Logical Systems | 629 | 543 | -14% |
| Web Support Services | | | |
| GetHelp Searches | 560,589 | 119,886 | -79% |
| UH Web Site Page Views | 132,471,437 | 113,697,803 | -14% |

IT PLANNING AND FINANCIAL CHALLENGES

IT Planning is based on the synthesis of three sources of information: the IT 10-year Plan, our strategic priorities and vision and input from stakeholders across the University. The IT plan tracks which major physical components are due for renovation or upgrade and where points of technology “stress” will occur. The president’s statements provide direction for our medium- and long-term goals. Stakeholder requests are usually near- or immediate-term.

In 2011, the UH network supported approximately 10,000 devices daily. Today, more than 89,000 devices access the UH network each day.

Historically, UIT has been able to offset increasing expenses through good management practices and prioritization of projects. Reorganizing departments to increase efficiency, choosing technologies that provide the best return on investment and insourcing work typically performed by outside services has allowed for reallocations to enable priority projects each year. At this point, we have implemented all available large and medium efficiencies. UIT faces a budget deficit in FY2020 that cannot be offset without affecting our ability to deliver IT services critical to the University.

Achieving an adequate and sustainable funding model is paramount to continue IT operations and provide state-of-the-art services.

To remain competitive, UH must simultaneously run, grow and transform its IT resources and the way services are delivered. With most of the IT budget consumed just by running existing services as they stand now, little is left for expected growth, and even less for transformation.

Peer Benchmarks: Percentage of IT Budget Spent

| | RUN | GROW | TRANSFORM |
|-----------|-----|------|-----------|
| UH | 90% | 5% | 5% |
| TAMU | 77% | 11% | 12% |
| UT-DALLAS | 85% | 13% | 2% |

Source: Core Data Survey 2018, Educause

A decade of growth in enrollment, academic and research initiatives and new facilities construction has increased IT costs. As enrollment and employee counts rise, there is a corresponding increase in licensing costs for software, especially large, enterprise deployments that are essential, such as PeopleSoft and Microsoft. UIT has minimized the increases as much as possible by renegotiating agreements to reduce services to the bare essentials. These growth-driven increases rise by hundreds of thousands of dollars annually — without corresponding budget increases.

SHARED IT GOVERNANCE AND SHARED SERVICES

IT services provided to the UH community are guided by shared IT governance. The University has 15 colleges and five divisions, each with a distributed IT organization. The management of each is responsible for administering and protecting its IT resources. Through the Technology Partners Program (TPP), UIT collaborates with colleges and divisions to develop procedures and establish internal controls for IT resources in the following areas: **Risk Management, Resource Security, Project Management, Resource Management, Service Continuity Management**

As part of shared IT governance, there are three policy roles defined in MAPP 10.03.06:

- **College/Division Information Resource Manager (C/D-IRM):** The most senior administrator who is responsible for managing the college or division’s information resources,
- **College/Division Technology Manager (C/D-TM):** An IT professional who is responsible for managing the college or division’s daily information technology operations and projects, and
- **College/Division Information Security Officer (C/D-ISO):** An IT professional, usually reporting directly to the IRM, responsible for managing the college or division’s information security functions in accordance with the established policies and guidelines.

IT decision-making is a collaboration among the UH senior executive team, business owners, Student Senate, Faculty Senate and other key governance groups.

UIT offers the Technology Review program (CTR) to UHS campuses and UH units. The CTR is a comprehensive assessment that enables us to collaborate and understand the unit’s IT operations, recommend industry best practices and promote shared services. Shared services have repeatedly produced substantial savings, enabling coordinated and efficient service delivery. They achieve economies of scale and free our Technology Partners to invest their resources in delivering local support and specialized services.

BUILDING OUR FUTURE: THE STRATEGIC PLANNING PROCESS

UIT began assembling these Strategic Priorities in May 2019. We examined the latest IT trends in higher education alongside the goals of the University and proposed 11 priority areas. Then, we surveyed faculty, staff and students to rank these and propose any additions for consideration. Over 130 participants contributed to these Strategic Priorities. The results of the survey are shown below:

| RANK | STRATEGIC PRIORITY | SCORE | RANK | STRATEGIC PRIORITY | SCORE |
|------|--|-------|------|----------------------------|-------|
| 1 | Information Security | 2.80 | 6 | Shared Services | 2.52 |
| 2 | Continuity of Operations | 2.76 | 7 | Mobile Technologies: UH Go | 2.39 |
| 3 | Network Connectivity | 2.75 | 8 | Blended Data Center | 2.38 |
| 4 | Collaboration and Unified Communications | 2.59 | 9 | Academic Technologies | 2.36 |
| 5 | Data Management and Analytics | 2.54 | 10 | Research Computing | 2.23 |
| | | | 11 | Internet of Things (IoT) | 1.95 |

For each Strategic Priority, we then conducted a gap analysis to identify where we are today in alignment with our state mandates and university goals, where we see ourselves in the future and how we will get there. The next pages show the results of these efforts.

INFORMATION SECURITY

OVERVIEW

There is a hostile cybersecurity landscape with challenges for all organizations to navigate, as evidenced by the regular media features about cybersecurity threats touching all industries.

With many similarities to small cities, universities face a diverse environment that includes a large variety of services, intellectual and research data and robust, high-speed networks. Maintaining appropriate safeguards within the university ecosystem requires a comprehensive and innovative approach to information protection.

ALIGNMENT

- ▲ **With the University — Competitive Resources:** Secure computing and communication is the foundation that supports a competitive array of essential resources.
- ▲ **With the State — Reliable & Secure Services:** Proper security measures protect the integrity and confidentiality of information.
- ▲ **With Federal Mandates:** Position UHS as a leader in cybersecurity by partnering with FBI Houston InfraGard BOD and other federal entities.

Program Goals

| | |
|---|--|
| Centralize UHS Information Security Program | Define Comprehensive and Integrated Cybersecurity Incident Response Plan |
| Implement UHS Vulnerability Scanning program | Implement UHS Security Operations Center (SOC) |
| Implement Comprehensive Assessment Process and Controls for 3rd Party Hosted Services | Verify Comprehensive Change Management Control Process Implemented on all UHS Campuses |
| Implement centralized Security Incident Event Management (SIEM) for UHS | Identify Relevant Information Risk and Value Metrics |
| Implement UHS Standardized Risk Assessment Process | |

SECURITY

CURRENT STATE

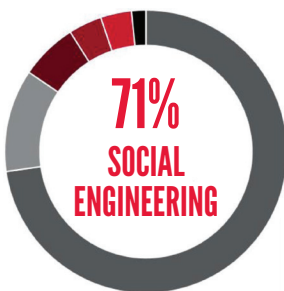
- Centralized IT Security programs across UHS, including funding, staffing, and initiatives.
- Improved our security rating by strengthening our desktop and edge protection approaches.
- Successfully addressed all findings in the external audit of IT Security.

PATH TO SUCCESS

- Continue collaborating at the UH System level. Collaborations, both internal and external, have not only contributed to the program's effectiveness, but have also created a platform for regional, state and national recognition of UH cybersecurity efforts, which benefits UH academic programs, students, faculty and researchers.
- Continue engaging UH executive leadership, which has been and will remain critical to the success of IT security efforts.

FY2020 INITIATIVES

- Implement 2-factor authentication for the protection of user account credentials and access to university resources.
- Add security controls/enhancements for Office 365 mail and file infrastructure.
- Strengthen pre-deployment application security testing.
- Expand university internal scanning abilities to include the ability to detect security concerns related to specialized facility systems, such as HVAC and other Industrial Control Systems (ICS).



FY2018 Total Incidents – 540

- Social Engineering — 383
- Hacking — 57
- Error — 64
- Physical — 16
- Malware — 15
- Misuse — 3
- Environmental — 0



“Collaborations, both internal and external, have not only contributed to the cybersecurity program’s effectiveness, but have also created a platform for regional, state and national recognition of UH cybersecurity efforts.”

Mary Dickerson

Assistant VC/VP and CISO,
IT Security

CONTINUITY OF OPERATIONS

OVERVIEW

UH must be prepared for timely restoration of critical IT services to support essential functions in the face of an emergency or a service disruption. This means investing in technologies that involve not only the uninterrupted operation of critical systems and services, but also implementing the right set of processes to achieve continued operations.

UIT has processes and procedures in place, outlined in the UIT Continuity of Operations Plan (COOP), to assure service continuity. These include quantifying the business impact of our 11 critical core services and 25 critical information resources, setting a high target of 99.9% service availability for core services, implementing 24 x 7 x 365 monitoring services through the IT Availability Center (ITAC), assigning clear roles and responsibilities for incident management and outlining appropriate communication channels.

ALIGNMENT

- ▲ **With the University — Policy:** The UIT COOP outlines the preparedness, response, assessment, recovery and mitigation of UIT resources. The UIT COOP is consistent with established practices relating to interoperability of emergency response actions, and aligns to the UH Emergency Management Policy MAPP 06.01.01 and UH Continuity of Operations Policy MAPP 06.01.02.
- ▲ **With the State — Continuity of Operations:** The UIT COOP complies with recommendations from the Texas Department of Information Resources (DIR) agency.
- ▲ **With National Entities:** The UIT COOP incorporates the use of the National Incident Management System (NIMS) National Response Framework (NRF), Incident Command (IC) and National Fire Protection Association (NFPA) 1600® Standard on Disaster/Emergency Management and Business Continuity Programs to facilitate interoperability within the university and between responding mutual-aid agencies.

UIT Continuity of Operations Plan (COOP)

11 Critical Core Services

25 Critical Information Resources

UIT Service Availability Dashboard available at <http://www.uh.edu/infotech/about/performance/dashboard/>

CONTINUITY

CURRENT STATE

- We have consistently met our 99.9% service availability SLA for critical core services and applications such as AccessUH, myUH (PeopleSoft), LMS (Blackboard), Email, Web Farm and Emergency Services.
- UH has mature incident and change management processes to quickly address service affecting incidents and proactively communicate with customers when planned outages will occur.
- Service availability, outages and resolution are communicated to our customers by email and through the UIT Service Dashboard.

PATH TO SUCCESS

- Success is measured by achieving our target service level agreements (SLAs) for critical core services and information resources.
- The Continuity of Operations program is expanding to align best practices among the UH System campuses (UH, UH-Clear Lake, UH-Downtown and UH-Victoria).
- Incident management processes and procedures are continually being evaluated to identify areas for improvement.

FY2020 INITIATIVES

- Remain responsive to growing service needs in our critical core services and applications.
- Focus annual UIT COOP exercise on highest risk areas and identify areas for continued improvement.
- Initiate the expansion of the Service Continuity program to include UHCL, UHD and UHV.



FY2019

99.9% service availability for all core services = **Target Met**



"IT Services are the critical backbone of a university's administration, communications, and daily operations. UIT must be prepared to continue operations regardless of the nature of an emergency or the level of impact on our community."

David Johnson

Assistant Vice President, UH
Technology Services
and Support

ACADEMIC TECHNOLOGIES

OVERVIEW

During the last few years, the University has been investing in transformative academic technologies, including Active Learning Classrooms (ALC) in support of active learning instruction (ALI), an up-to-date Blackboard platform and upgraded infrastructure in general purpose classrooms. University investments in academic technologies are driven by the continued prioritization of online learning, the proliferation of the use of personal technology among students, and embracing technologies that promote ALI by faculty.

The Provost’s Office and academic departments are incubators of innovation in academic technologies. UIT sees its role to be facilitating the adoption of best practices developed by the academic experts. This is accomplished by working with departments to identify key technologies and establishing strategies for campus or systemwide implementation, empowering all academic units to benefit from these technologies and the instructional framework established by their peers.

ALIGNMENT

- ▲ **With the University — National Competitiveness:** UIT, in collaboration with Academic Affairs and UH colleges, has been upgrading and maintaining the technology infrastructure in academic spaces throughout our campus. In addition, UIT continues to partner with colleges to provide technical support to faculty in all general-purpose classrooms.
- ▲ **With the University — Student Success:** UIT is collaborating with Faculty and Departmental Instructional Support (FDIS) to enhance academic spaces and implement ALC to increase student success.



| | |
|------|--|
| 117 | General Purpose Classrooms Supported in 2019 |
| 438 | Equipment Requests in 2019 |
| 100% | On Time AV Equipment Deliveries to Faculty |

CURRENT STATE

- Support over 100 UH general purpose classrooms located in 18 buildings. classroom educational technologies require ongoing maintenance, which includes the projectors, computers, smart podiums, response technology and all other technologies our faculty use in the classroom.
- Maintain and monitor a robust and reliable Gigabit Wi-Fi network in all academic spaces
- Partner with FDIS and college IT units to support their needs in ALC and specialized facilities. The first UH ALC was built in Cougar Place in 2016. FDIS provides ALC support for instructors and helps them to design courses that leverage active learning instruction.

PATH TO SUCCESS

- Collaborate with academic leaders at the individual, departmental, institutional and system level to identify critical technologies.
- Define standards that provide high levels of flexibility and portability of instruction between classrooms or from classroom to the online environment.
- Develop acquisition strategies that leverage volume purchasing and site licensing options.

FY2020 INITIATIVES

- Transform general purpose classrooms by implementing technology enhancements and flexible environments
- Engage faculty members and key instructional partners to collaborate and guide the development of new learning spaces.
- Promote new technologies in support of academic services, such as Zoom Video Communications, Office 365 and MATHLAB.



"Our goal is to enhance the classroom learning environment by effectively integrating technology and flexible furniture to meet the needs of all students"

Leroy Mays

Director, Technology Services and Support

NETWORK CONNECTIVITY

OVERVIEW

Faculty, students and staff rely on voice, data and video services to communicate and work on a daily basis. Network connectivity is a core component to any IT service and provides the underlying infrastructure for all voice, data and video.

Supporting the growing demand for ubiquitous Wi-Fi services on campus is paramount. In 2019, over 89,000 unique devices connect to the campus Wi-Fi network each day. In order to improve this service, there must be continued investment in building a robust infrastructure.

Equally important is the need to continue improving the network connectivity to the world and to our research networks, resulting in faster access to applications and increased productivity.

ALIGNMENT

- ▲ **With the University — Competitive Resources:** UIT works with colleges and divisions to assess their network infrastructure and emerging needs to continuously improve network services, contributing to a mission-critical resource base.
- ▲ **With the University — Student Success:** UIT strives to ensure the students’ need for a ubiquitous and reliable Wi-Fi network is consistently met.
- ▲ **With the UH System — Principles 1 and 9:** UIT works with other UHS campuses through the Technology Review program, sharing best practices for design and implementation of wired and Wi-Fi networks. This supports two UHS Principles: the whole is greater than the sum of the parts, and UHS maximizes the benefit to faculty/staff of being within a system (Appendix A).
- ▲ **With the State — Reliable & Secure Services:** UH wired and Wi-Fi networks address the critical Connectivity part of this TX-DIR strategic goal.



65% Aruba / 35% Meru

In 2019

5,359 Wi-Fi Access Points

40,600 = Average simultaneous devices during peak time

Over 89,000 unique devices in a peak day

\$8.6M

Investment in network infrastructure during the last 3 years



CURRENT STATE

- In 2016, through a comprehensive process, UIT selected Aruba Networks as the network provider.
- In order to improve Wi-Fi services, the University allocated over \$3 million during the last three years for Wi-Fi infrastructure.
- Since summer 2016, 54 buildings have been upgraded from Meru Networks (legacy manufacturer) to Aruba, providing higher speeds and increasing performance by 40%.
- A space categorization and prioritization strategy was put in place to first upgrade academic areas, followed by research, social, administrative and outdoor spaces. 100% of academic and research spaces have been upgraded to higher speed Wi-Fi.

PATH TO SUCCESS

- Sunset the legacy, Meru Wi-Fi infrastructure, which is at the end of its lifecycle and still constitutes 35% of the campus Wi-Fi network. The remaining, mismatched equipment prevents the use of common management and monitoring tools, adding unnecessary complexity and negatively affecting incident resolution.
- Retire aging distribution and access network hardware. There are 94 distribution switches and 1,417 access switches. Approximately 10% of this UH network infrastructure is due for upgrade.
- Upgrade network management systems, firewalls and Wi-Fi monitoring tools to maintain vendor support.
- Upgrade network facilities in all buildings to support 10GB uplinks.
- Continue to support network growth brought by expansion and capital projects.

FY2020 INITIATIVES

- Complete the upgrade from Meru to Aruba for all academic buildings (five remaining).
- Complete the distribution network upgrade to support 10GB uplinks in all network facilities.
- Upgrade fiber terminations to improve performance and reliability.



"Providing ubiquitous and reliable network services in support of our university mission and strategic goals is our core commitment."

Rita Barrantes

*Ph.D., M.B.A., PMP
Director, Technology Services
and Support*

COLLABORATION AND UNIFIED COMMUNICATIONS

OVERVIEW

Users expect communication and the ability to share information and stored data to be seamless, uninterrupted and available wherever they may be. Lines are blurring and even disappearing between services that once were distinct (e.g., PBX, meetings and conferences, customer call centers, email, instant messages, file sharing, collaboration, integration between applications).

ALIGNMENT

- ▲ **With the University — Competitive Resources:** The evolution from conventional telephony to unified communications - Lync to Skype for Business (SFB) and now, to MS Teams - to manage the confluence of communication and information helps maintain a resource base that keeps UH competitive.
- ▲ **With the State — Mobile & Digital Services:** Continuing the growth of a unified communications platform supports the growing reliance on mobile devices to make business communication continuous, robust and portable.



Number of **Email Messages** in FY2018
889,333,000

Number of **Phone Calls** in FY2018
8,764,892

CURRENT STATE

- Implemented a robust unified communication system enabling telephony, video, instant messaging, email and conferencing.
- Finished the transition to Voice-over-Internet Protocol (VoIP) telecommunications using SFB.
- Standardized video conferencing to SFB for business use and Zoom for faculty/student instructional interaction.
- Completed Office 365/OneDrive rollout.
- Replaced Cisco call centers with Anywhere365.

PATH TO SUCCESS

- Integrate end-user collaboration technology. Integration must be an underlying principle in choosing and implementing the tools used for data, connectivity and communication needs.
- Continually assess the future of Unified Communications, including the implementation of cloud PBX and emerging solutions such as MS Teams.

FY2020 INITIATIVES

- Implement functional enhancements to Anywhere365 call center application.
- Deploy MS Teams universitywide.
- Enable device-based activation of Office 365.
- Deploy email services for students.
- Raise user awareness of calendar and conferencing capabilities.



Number of **Instant Messages** in FY2018
4,230,681



“Unified Communications connects voice, video, meetings, collaboration, files and more — wherever we are, on the device we choose.”

Omar Farooq

Manager, Telecommunications

DATA MANAGEMENT AND ANALYTICS

OVERVIEW

Data Management and Analytics services are core components in our efforts to facilitate information-based decision making. The Data Warehouse infrastructure has grown since its inception in 2007 and now holds over 1.5TB of data to provide an efficient data reporting and visualization capabilities for the campus community. On average, there are 575 daily visits to UH public and private dashboard websites.

ALIGNMENT

- ▲ **With the University – Community Advancement:** Managing an enormous quantity of data and making it easily accessible to executives and managers keeps UH on track to fulfill the workforce needs of our rapidly growing city and region.
- ▲ **With the University — Student Success:** By presenting concise, clear, up-to-date insights derived from vast underlying data, UIT helps inform critical decisions that boost the ability of our students to successfully complete their educational objectives.
- ▲ **With the State — Data Utility:** Our Data Warehouse and the growing number of dashboards built on it help UHS and UH to succeed in the Data Management & Governance and Data Analytics components of this TX-DIR goal.



570

Over 570 visits/per day to the Unified Dashboards platform

1.5 TB

Over 1.5TB of data in the University Data Warehouse

ANALYTICS

CURRENT STATE

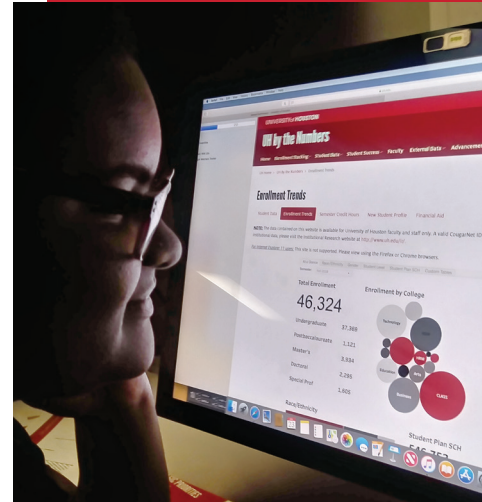
- Over 1.5TB of data hosted in the University Data Warehouse to provide efficient data reporting and visualization capabilities for the UH community.
- Current dashboards include Enrollment and Admissions, Parking and Transportation, Auxiliary Services Point-of-Sale, AccessUH and University Information Technology.
- Implementation of dashboards for Key Performance Indicators (KPIs), which entails the collection, mapping and display of data in a unified environment.

PATH TO SUCCESS

- Sustain the growth in data analytics with unified data integration processes, standardized data presentation tools/templates and a unified data visualization environment.
- Provide a data analytics platform with built-in security that meets the needs of all users.

FY2020 INITIATIVES

- Expand the Unified Dashboard environment to include the Division of Administration & Finance
- Continue supporting the emerging data analytics needs of Enrollment Services and Auxiliary Services



"Our challenge for the future is to sustain the growth in data analytics."

Haseen Mazhar
Executive Director,
Enterprise Applications

AccessUH

24,750

Unique Logins
Daily Average

20,990,624

Logins in 2018

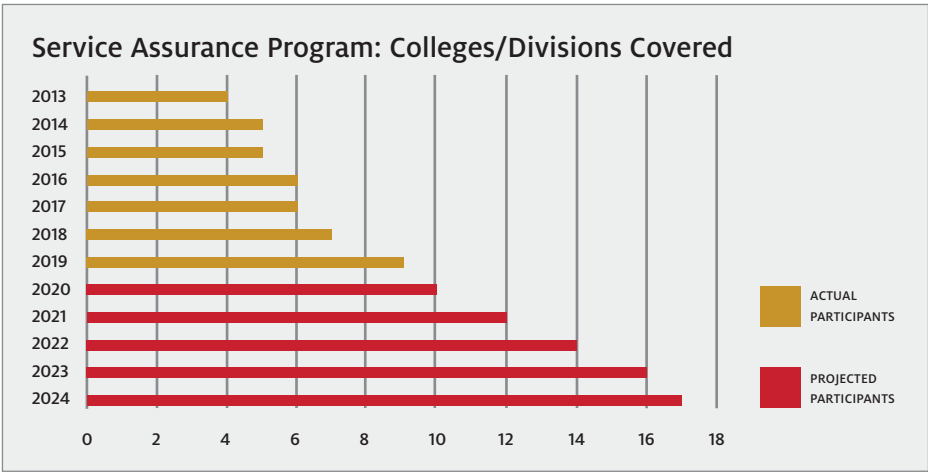
SHARED SERVICES

OVERVIEW

Cost optimization brings colleges, divisions, system universities, and University IT together to leverage Shared Services to meet IT service-level expectations while controlling costs. A collaborative Shared Services solution develops business processes and service level agreements that distribute service delivery between local units and UIT to deliver value to the University and to the UH System.

ALIGNMENT

- ▲ **With the University — Competitive Resources and Student Success:** Actively establishing the optimal combination of locally and centrally provided IT services produces the Competitive Resources essential to assure Student Success.
- ▲ **With the UH System — Principles 1 and 9:** Carefully chosen Shared Services further the 1st and 9th Principles of the UH System: that the whole is greater than the sum of its parts, and that UHS maximizes opportunities for both its faculty and students to benefit from being within a system (Appendix A).
- ▲ **With the State — Mature IT Resources Management:** The Service Assurance program keeps UIT in sync with the business priorities of the community it serves, furthering the Cost Optimization part of this goal.
- ▲ **With the State — Cost-effective & Collaborative Solutions:** As described by TX-DIR, Shared Services allow UHS/UH to focus limited resources on IT applications and supported business functions to yield improved operational efficiency, optimized delivery services, cost savings and harmonized operations.



SHARED SERVICES

CURRENT STATE

- Technology Managers TMs in each college and division implement IT policies and work with UIT to create the optimal balance of central and localized services for their units' needs.
- Technology Reviews seek specific ways to improve economy and efficiency in delivering IT services within a college, division or system university. Since the program began in 2010, UIT has reviewed nine colleges, five divisions (or sections of them) and three system universities.

PATH TO SUCCESS

- Increase the breadth of enterprise-level IT technologies implemented as Shared Services both across the campus and systemwide, with particular emphasis on common technology platforms (e.g., PeopleSoft, Blackboard LMS, Exchange email, Skype for Business, SharePoint, Microsoft Teams, Office 365 and cloud storage). This will enable the uniform implementation of best practices, greatest economies of scale and lowest total cost of ownership.
- Collaborate systemwide to deliver business value through IT services on additional, key technical activities, such as network standards, enterprise infrastructure planning, IT assessments and best practices, change management, continuity of operations and IT management tools.

FY2020 INITIATIVES

- Conduct Technology Reviews for Bauer College of Business and College of Technology.
- Identify services that benefit most from economies of scale as possible candidates for the Shared Services model.
- Seek opportunities to eliminate redundancy, reduce cost and improve standardization across the UH System.



14 Technology Reviews
for UH Colleges/Divisions

3 Technology Reviews
for UHS Campuses



"The cost savings achieved by economies of scale through implementing shared services cannot be overstated."

Bill Spindler

MBA, CPA

Director, Business Services

MOBILE TECHNOLOGIES: UH GO

OVERVIEW

The University provides an extensive suite of online and technology enabled tools to allow students to access resources, succeed in class, communicate with faculty and staff and conduct business with the University.

UIT has worked with UH Marketing to create a comprehensive mobile app for UH students that consolidates communication, business functions, social and student life activities and academic support into a single mobile platform to improve student life and facilitate student success.

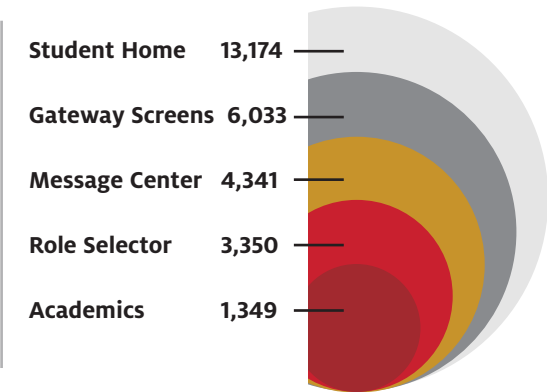
The current generation of students engages with the world through their mobile devices. Creating a comprehensive mobile app for UH students to provide access to critical UH services will improve student success. Given that 96% of students prefer mobile apps to mobile-ready portals, we are integrating AccessUH and 3rd party apps into UH Go, the official mobile app for the University of Houston.

ALIGNMENT

- ▲ **With the University — National Competitiveness:** In collaboration with UH Marketing, we are working to assess the needs of colleges and divisions and define technical solutions for offering unique services to students, faculty, and staff.
- ▲ **With the University — Student Success:** Providing students with a single, comprehensive app is an institutional priority. Transitioning core services already available online and through existing apps to the UH Go app is a key part of this effort.
- ▲ **With the UH System — Principle 9:** We are working with other system component campuses to assess the feasibility of using the same platform for all campuses to leverage development resources, which helps maximize the benefit to faculty/staff of being within a system (Appendix A).
- ▲ **With the State — Mobile & Digital Services:** UH Go helps to create a seamless and consistent user experience across many devices, services and applications.

TOP 5 MOBILE APP SERVICES BY USAGE

*Number of Views
as of June 2019*



CURRENT STATE

- To date, 12 services have been integrated into the UH Go mobile app, including myUH, parking, housing, dining, emergency notification, calendar and events, catalogs, laundry view, wayfinding and location beacons that use Aruba access points in the Student Center.
- Integrations are in progress for BlackBoard; AccessUH; Touchnet (CougarCard); a grade center that aggregates grades from myUH, CASA (Courseware) and Blackboard; Parking Guidance System; single sign-on using Office 365; and Communicate Directory Services to better target messaging within the app.

PATH TO SUCCESS

Single sign-on via Office 365 using biometrics is key to the success of the app. Making it easier to log in and use services will keep users coming back. Other efforts to keep Coogs using the app are to:

- Simplify the mobile ecosystem at UH by providing a policy that covers governance, procurement and easy-to-follow steps to get services integrated into the app.
- Provide just-in-time services through UH Go every 6–8 weeks.
- Target meaningful messages to groups and individuals.
- Ensure that UH Go is service-heavy, rather than content-heavy.
- Use gamification and user incentives to keep the app installed.

FY2020 INITIATIVES

- Deploy Marketplace, providing students a safe forum to interact with each other to buy and sell goods and services, pay organization fees, set up a commuter or ride-share area — the possibilities are endless.
- Deploy beacons in more buildings to guide users to scheduled events.
- Continue to reduce the number of apps at UH. Even though three existing services already available through a third-party app were integrated into UH Go, three new apps were added.



“Creating a comprehensive mobile app for UH students to provide access to UH services will improve student success.”

Diane Trippel

Director, Web and Communications Services

UH GO MOBILE APP:

Adoption Rate (downloads)

- As of August 2018: 8,930
- As of June 2019: 11,798

STUDENT SATISFACTION:

Google Play: 5 stars
iTunes: 3.9 stars



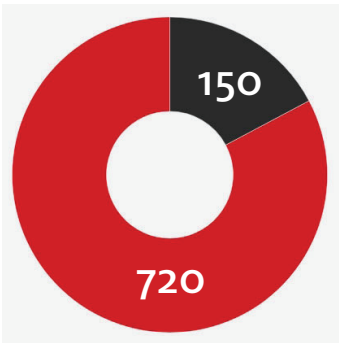
BLENDDED DATA CENTER

OVERVIEW

A blended data center is a hybrid operation that combines cloud-based and on-premises components. Having a blended data center enables us to implement services while increasing value and lowering costs. On-premises elements are provided from the University Data Center maintained by UIT; the cloud-based services may range from software to platform to infrastructure as a service (SaaS, PaaS, IaaS; e.g., Microsoft Azure, Microsoft OneDrive, AWS, Adobe Creative Cloud).

ALIGNMENT

- ▲ **With the University — Competitive Resources:** Implementing carefully selected resources enables UIT to provide the most current services at optimal cost.
- ▲ **With the UH System — Principles 1 and 9:** Carefully chosen cloud services at the system level further the 1st and 9th Principles of the UH System: that the whole is greater than the sum of its parts, and that UHS maximizes opportunities for both its faculty and students to benefit from being within a system (Appendix A).
- ▲ **With the State — Reliable & Secure Services:** A blend of locally provided and cloud services gives flexibility to our strategy to assure security and continuity of operations.
- ▲ **With the State — Mature IT Resource Management:** This approach allows us to choose the optimal combination of service-level value and cost.



Infrastructure

Virtual vs. Physical

- Virtual Servers (83%)
- Physical Servers (17%)

CURRENT STATE

- Higher education, like all industries, is increasingly adopting cloud technologies to replace on-premises service solutions.
- UIT has implemented Office 365 and MS OneDrive, and is taking steps to define the migration path to MS Teams.
- Cloud technologies are proliferating, with more options and greater competition among providers.
- The UH cloud in the Data Center has virtualized 83% of the server infrastructure.

PATH TO SUCCESS

- Lead and advise in the move to the cloud. The rapid expansion of cloud-based services makes it easier and more tempting for individual departments to negotiate directly with vendors of these technologies.
- Maximize consistency and economies of scale. UIT will achieve this by proposing standard criteria and selection processes, helping create cost/value assessments and being a trusted advisor to UH departments.

FY2020 INITIATIVES

- Emphasize strategic rather than transactional vendor relationships.
- Make business process redesign an integral, preliminary step when replacing a technology solution or considering a move to the cloud.
- Promote and lead the definition of a business process redesign strategy that spans functional unit boundaries by engaging multiple units where applicable.



"In the expanding world of the cloud, UIT is leading the way to identify and implement services that increase value while lowering cost."

Eric Block

Director, Enterprise Architecture

RESEARCH COMPUTING

OVERVIEW

Research demand for High-performance Computing (HPC) is growing rapidly across more academic disciplines, requiring faster computing, ability to manage and transfer ever larger amounts of data quickly and securely and to a broader community, and shorter front-end time from needs request to computing to science acquisition to knowledge dissemination and technology transfer.

ALIGNMENT

- ▲ **With the University — National Competitiveness:** The quality, capability and performance of HPC resources are critical factors in strengthening the status of UH as a nationally competitive public research university.
- ▲ **With the University — Local and National Recognition:** Advanced computing resources help to secure local and national recognition for UH research achievements.
- ▲ **With the UH System — Community Advancement:** HPC plays a key role in enabling rapid progress from research to technology transfer that directly contributes to Community Advancement.
- ▲ **With the State — Data Utility:** The UIT HPC group’s efforts, together with those of Core facility for Advanced Computing and Data Science (CACDS), directly accomplish the Data Analytics component of TX-DIR’s Data Utility strategic goal and can promote the Open Data component of the Data Utility goal.

1,054 Number of TeraFlops Floating Point Operations/Second

391 Number of Researchers Using High Productivity Resources

CURRENT STATE

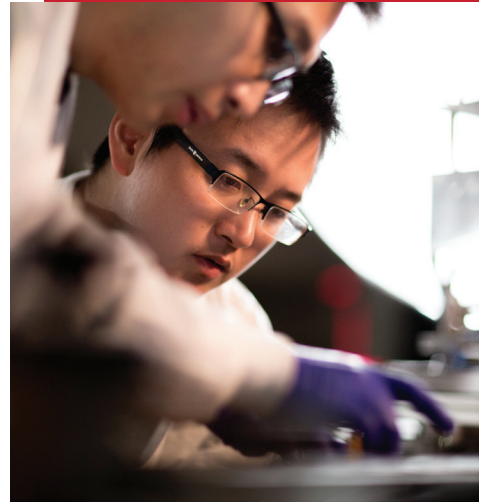
- The UIT-HPC group provides infrastructure support, system administration and backup for computing, as well as storage equipment, including the clusters at CACDS, and other equipment (mostly grant funded) housed in the Research Computing Center.
- UIT is not generally involved in projects until hardware is acquired, and is not often consulted for input to grant proposals. UIT can add more to the value of HPC resources throughout the process.

PATH TO SUCCESS

- Continue the UIT-HPC/CACDS partnership to propel UH research forward by reducing barriers to entry for new researchers interested in High Performance Computing, especially those in less represented areas like arts/humanities, social sciences and business.
- Improve administrative processes to acquire and use research IT resources. Speed is essential not just in computing and handling data, but also in acquiring and implementing technology.

FY2020 INITIATIVES

- Actively advise on emerging directions, such as massively scalable database architecture, cloud-based HPC and Science DMZ for secure, rapid sharing of large datasets over high-speed WAN.
- Promote awareness and use of HPC by under-represented areas, offering guidance in business processes like funding, and not just the technology.
- Give researchers opportunities to consult with UIT and CACDS experts throughout the research cycle, from planning through post-publication storage and data sharing.
- Facilitate archiving of and rapid access to research data to overcome data islands and maximize scientific utilization and application after the primary project.



“HPC stands at the forefront of scientific discovery and supports innovations ranging from drug design and oil reservoir modeling to complex financial analysis.”

Keith Crabb

Manager, High Performance Computing

INTERNET OF THINGS (IoT)

OVERVIEW

The evolution of the Internet of Things (IoT) continues to confirm its important position in the context of information and communication technologies and the development of higher education. With IoT, institutions can enhance learning outcomes by providing better academic experiences, improving operational efficiency and gaining real-time, actionable insight into student performance.

With the proliferation of smart devices and Wi-Fi connectivity, students are connecting wirelessly using multiple devices such as laptops, tablets, smartphones and wearables. Understanding the potential benefits of IoT technologies and having the ability to implement and manage them effectively are essential to be competitive in higher education. At UH, we intend to use IoT technologies to achieve a smarter, more connected and safer campus. While IoT is still an emerging field, UH already offers innovative solutions using real-time data collection to provide a responsive and personalized student experience.

ALIGNMENT

- ▲ **With the University — National Competitiveness:** UIT supports academic and research initiatives at the Colleges of Engineering, Technology, Pharmacy, and Natural Sciences and Mathematics that require IoT devices such as microscopes, environmental sensors and monitoring cameras.
- ▲ **With the University — Student Success:** UIT and Campus Safety are replacing analog security cameras with digital. Wired and wireless access control is supplanting legacy keys. With Parking and Transportation, UIT is enabling license plate recognition in parking areas, and multiple garages now feature a parking guidance system. In residential halls, students now enjoy technologies like smart TVs, digital signage, voice-recognition digital assistant (e.g., Alexa), Wi-Fi printers and IP-based gaming consoles.
- ▲ **With the University — Athletic Competitiveness:** Recent IoT efforts for Athletics include ticket scanning, iris recognition (biometrics), smart lighting and video in Fertitta Center and POS (point-of-sale) advances.
- ▲ **With the State — Mobile and Digital Services:** As TX-DIR explains, “IoT can provide opportunities for agencies to leverage data to make services smarter, more responsive, and citizen-centric.”



Over 1,200 campus IP security cameras

Over 230 digital signage units on campus

CURRENT STATE

- 1,200 digital security cameras and 45 license plate recognition cameras installed on campus.
- Over 230 digital signage units across campus.
- Wired and wireless access control solution installed at Katy Campus and Parking Garage 5.
- Smart parking guidance system installed in Parking Garage 5, Welcome Center Garages, Calhoun Garage, and Stadium Garage.
- Smart lighting for Athletics events installed at Fertitta Center.
- Network-enabled microscopes and other specialized equipment used for research purposes.

PATH TO SUCCESS

- Continue supporting Campus Safety Systems and the UH Police to sunset the existing 400 analog security cameras and replace them with digital models.
- Continue partnering with the colleges and the Division of Research to support emerging IoT academic and research needs.
- Continue supporting the IoT needs of University Parking and Transportation, Student Housing and Residential Life, Facilities Management and other units as needed.

FY2020 INITIATIVES

- Implement the license plate recognition (LPR Phase 3) cameras in 12 parking areas.
- Implement wireless, smart locking solutions in the new Quadrangle residential buildings and in Garage 6.
- Replace Tier 1 (building entrances) analog cameras with IP cameras in multiple buildings.
- Expand the implementation of Aruba Networks' location-based services, currently being piloted in the Student Service Center.



“Security for IoT is important and UIT continues to review and revise the networks associated with the IoT devices.”

Charles Chambers

Manager, Network Planning and Development

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Thank you to these members of the UH community for their thoughtful contributions to this project. Their effort was essential to define and rank IT strategic priorities that will best advance the University's mission in fiscal years 2020–2024.

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APPENDIX

UNIVERSITY OF HOUSTON SYSTEM PRINCIPLES

Principle 1: The whole of the UH System should be greater than the sum of its parts.

Principle 2: The UH System should provide access to the people of Houston throughout the Houston metropolitan region, making that access as convenient as is academically and financially possible.

Principle 3: The UH System's institutions should be the primary providers of educational access in the Houston metropolitan region. However, they should seek partnerships with other institutions when it benefits students and when it is naturally advantageous.

Principle 4: The UH System should establish some distinctive mission differentiation among its institutions, while still enabling them to serve the needs of their region.

Principle 5: The UH System management structure should be as simple as is possible and should ensure clarity of responsibility and accountability.

Principle 6: The UH System should be strategic about its enrollment growth and intentional about its tuition and other financial strategies.

Principle 7: The UH System should ensure a standard of excellence throughout its institutions, while recognizing differences in student populations and missions.

Principle 8: The UH System should have a clear nomenclature that will enhance international, national, state, and regional marketing and branding.

Principle 9: The UH System should maximize opportunities for both its faculty and students to benefit from being within a system.

UNIVERSITY OF HOUSTON GOALS

National Competitiveness: UH will strengthen its status as a nationally competitive public research university as measured by the Carnegie Foundation for the Advancement of Teaching and Top American Public Research Universities (TARU) and will seek to meet the threshold needed for its entry into Association of American Universities (AAU).

Student Success: UH will have a student profile consistent with a nationally competitive public research university by creating an environment in which student success can be ensured.

Community Advancement: UH will commit to fulfilling regional and state workforce needs while becoming the primary engine of social, economic, and intellectual development.

Athletic Competitiveness: UH will provide a comprehensive educational experience to its students and, within this context, it will seek to build the strongest athletic program possible.

Local and National Recognition: UH will be known for its accomplishments locally and nationally.

Competitive Resources: UH will build a resource base that enables it to accomplish its mission and realize its vision.



UNIVERSITYof **HOUSTON**
UNIVERSITY INFORMATION TECHNOLOGY